

of observations, draws a conclusion contrary to the current belief—viz. that a mild summer follows a mild winter. He studied the warm summers of Berlin from the year 1719 in one particular aspect—that is to say, with special reference to the succeeding winters. He regards that summer as warm when the temperature in June, July, August, and September, or at least in three of those months, is above the normal. Fifty-two such summers occurred between 1719 and 1885. Unfortunately there were certain gaps in the observations which could not be filled up; but there was no break in the observations between 1755 and the present, in all 130 years of uninterrupted observation. During this period there were 45 warm summers, or a proportion of 1 : 2·89. But, as in the case of mild winters, there was no periodicity of three years. Thus after the hot summer of 1763 there was not another for 12 years, and at the beginning of the present century there were 19 successive years (1799–1817) without a single hot summer. But in the case of the summers, as in that of the winters, a certain grouping is observable. In the 52 warm summers, in 31 cases 2 hot summers followed each other in succession, “so that one may wager 596 to 404 that one hot summer will be succeeded by a second.” The influence of a hot summer on the succeeding autumn and winter (October to February) is that of these months 2·82 were too warm. For the individual months, with the exception of November, the probabilities are about equal. Given a summer with July, August, and September hot, and a cold January, a warm December and February may be expected. As a general rule two warm winter months may be expected after a hot summer. But warm summers differ: they do not last the same length of time, they have not the same intensity; and these variations exercise an important influence on the succeeding winter months. The author then discusses the cold winters of Berlin and the respective probabilities of the succeeding months being cold. The results of the whole investigation he sums up in three propositions arranged and stated as follows:—(1) A $\left\{ \begin{smallmatrix} \text{moderately} \\ \text{very} \end{smallmatrix} \right\}$ mild winter will most probably be succeeded by a $\left\{ \begin{smallmatrix} \text{cool} \\ \text{hot} \end{smallmatrix} \right\}$ summer.

(2) A $\left\{ \begin{smallmatrix} \text{moderately} \\ \text{very} \end{smallmatrix} \right\}$ hot summer will most probably be succeeded by a $\left\{ \begin{smallmatrix} \text{moderately mild} \\ \text{cold} \end{smallmatrix} \right\}$ winter. (3) A $\left\{ \begin{smallmatrix} \text{moderately} \\ \text{very} \end{smallmatrix} \right\}$ cold winter will most probably be succeeded by a $\left\{ \begin{smallmatrix} \text{cool} \\ \text{cold} \end{smallmatrix} \right\}$ summer.

THE additions to the Zoological Society's Gardens during the past week include a Suricate (*Suricata tetradactyla*) from South Africa, presented by Miss F. M. Savill; two Common Badgers (*Meles taxus*), British, presented by Lord Willoughby de Broke; a Common Marmoset (*Leopoldus jacchus*) from Brazil, presented by Miss Henderson; a Cercopsis Goose (*Cercopsis nova-hollandiae*), a Black Swan (*Cygnus atratus*) from Australia, presented by Mr. F. L. Frodsham; a Mealy Amazon (*Chrysotis farinosa*) from South America, presented by Mr. W. Hodder; two Alligators (*Alligator mississippiensis*) from the Mississippi, presented by Mr. Charles Ridley; an Alligator (*Alligator mississippiensis*) from the Mississippi, presented by Miss Heimlicher; a Red-tailed Amazon (*Chrysotis erythrura*) from Brazil, three Upland Geese (*Bernicla magellanica* ♂ & ♂) from the Falkland Islands, three Wigeons (*Marca penelope* ♂ & ♂), European, purchased.

OUR ASTRONOMICAL COLUMN

OCCULTATION OF ALDEBARAN ON MAY 15.—The ephemerides do not take cognisance of occultations of the brighter stars, when near to the sun's place, nor indeed, as a rule, of occultations generally which occur whilst the sun is above the horizon of the place to which the calculations are adapted. In the

Monthly Notices of the Royal Astronomical Society for March, 1868, is a note communicated by Mr. R. S. Newall, drawing attention to an occultation of Aldebaran on May 22 in that year, when the star was little more than 8° distant from the sun, and suggesting that observation would be possible with a good equatorial, and, at any rate, would be worth trying, merely as a matter of curiosity. It does not appear from the succeeding numbers of the *Monthly Notices* that the occultation in question was anywhere observed, but on May 15 in the present year one of the same star will take place when its distance from the sun is 14½°, and some observers may be inclined to make an attempt to record the phenomenon. At the Royal Observatory, Greenwich, the star escapes occultation; in the north of England and in Scotland the times for the various observatories are as follow:—

	Disappearance			Reappearance		
	G.M.T.	Angle		G.M.T.	Angle	
	h. m.			h. m.		
Liverpool ...	2 50·0	19	...	3 5·7	353	
Stonyhurst ...	2 47·6	24	...	3 9·0	348	
Glasgow ...	2 39·6	38	...	3 10·1	334	
Edinburgh ...	2 37·9	39	...	3 14·2	334	
Duneech ...	2 35·3	45	...	3 16·9	328	

At Dublin the star disappears at 2h. 46·2m. G.M.T., and reappears at 3h. 1·0m.; angles 19° and 354° respectively, counted as usual in the *Nautical Almanac*.

VARIABLE STARS.—(1) Dr. Gould, in the *Uranometria Argentina*, enters into some detail with respect to the relative magnitudes of the bright stars in *Corvus*, to the discrepancies in estimating which Argelander first directed attention in vol. vii. of the “Bonn Observations.” It was considered that the Cordoba observations “served to remove all doubt as to the variability, within moderate limits, of all four of these stars, thus explaining the apparently contradictory nature of previous observations.” On the other hand, Mr. E. F. Sawyer, of Cambridgeport, Mass., says he carefully observed the bright stars of *Corvus* during the years 1882–84, and found that “β is certainly variable by nearly one magnitude, but that the other stars appear to be sensibly constant,” and he thinks the whole difficulty is thus solved. From Dr. Gould's remarks, however, there is room for doubt on this point.

(2) A minimum of R Leonis may be expected about May 26. The observations from 1840 to 1883 afford indications of the existence of a perturbation in the period.

THE DOUBLE-STAR γ EQUULEI.—The duplicity of this star was detected by Mr. G. Knott in 1867; his measures in that year give for 1867·543, position 276°·84, distance 2″·131. For the epoch 1877·728 Mr. Burnham found the position 274°·5, distance 2″·16. The annual proper motion of the principal star appears to be + 0·0027s. in right ascension, and – 0″·169 in declination, and if Mr. Knott's measures of 1867 are reduced to Mr. Burnham's epoch, with these values, they become—

Position 308°·0—Distance 3″·20, differing so widely from the Chicago results as to be strongly indicative of the binary character of the object.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, MAY 3–9

(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 May 3

Sun rises, 4h. 30m.; souths, 11h. 56m. 42·0s.; sets, 19h. 24m.; decl. on meridian, 15° 48' N.: Sidereal Time at Sunset, 10h. 11m.

Moon (at Last Quarter on May 7) rises, 22h. 32m.*; souths, 3h. 0m.; sets, 7h. 27m.; decl. on meridian, 18° 17' S.

Planet	Rises		Souths		Sets		Decl. on meridian
	h.	m.	h.	m.	h.	m.	°
Mercury ...	4	17	11	25	18	32	12 28 N.
Venus ...	4	33	11	56	19	19	14 58 N.
Mars ...	3	59	10	51	17	43	9 27 N.
Jupiter ...	11	50	19	7	2	24*	13 56 N.
Saturn ...	6	32	14	39	22	46	22 11 N.

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

Phenomena of Jupiter's Satellites

May	h.	m.		May	h.	m.	
3	...	23 35	II. ecl. reap.	7	...	0 4	I. ecl. reap.
5	...	2 3	I. occ. disap.			20 12	I. tr. egr.
		23 24	I. tr. ing.	9	...	1 38	II. tr. ing.
6	...	1 44	I. tr. egr.			23 56	III. tr. ing.
		20 32	I. occ. disap.				

The Phenomena of Jupiter's Satellites are such as are visible at Greenwich.

Saturn, May 3.—Outer major axis of outer ring = $38''.3$; outer minor axis of outer ring = $17''.4$; southern surface visible.

May 4, 17h.—Venus in superior conjunction with the Sun.

GEOGRAPHICAL NOTES

THE Austrian African explorers, Prof. Frederick Paulitschke and Dr. Dominik Kammel von Hardegger, have returned from their expedition to Africa. They started from Trieste on December 30, 1884, and chiefly explored the interior of the Gallas country. The Austrian explorers have established meteorological stations at Harrar and Zeila, which will be looked after by the English Consuls Pitten and King. The collections they have brought with them, filling several cases, will constitute a very valuable addition to the Austrian Imperial Museum.

At the January meeting of the Royal Swedish Geographical Society, Dr. F. Svenonius gave a very interesting account of his visits to certain remote parts of Swedish Lapland last summer. The speaker could not accept the theory set forth by some authorities that the word "Lapp" was derived from the Lappish *loap* or Finnish *lappi*, i.e. "end" or "finish," signifying the inhabitants of the end of the European continent. He believed that the word was derived from *lappa* or *lappah*, i.e. "cave" or "recess," a name given by the Scandinavians to this race from the habits of the Lapps in earlier times living or taking refuge in caves or recesses. It was a common thing, even now, for Lapps to take refuge in such places in bad weather, or for the night when travelling. Having referred to the remarkable structure which forms the dwelling of the Lapp, he proceeded to describe the mountains, glaciers, lakes, and waterfalls of Swedish Lapland. The mountains were more imposing seen from the Swedish than the Norwegian side, as in the latter place they were too close to the spectator. They were of two kinds, the so-called "alpine" and so-called "grass" mountains. The former were lofty and jagged, and the latter—the most common—low and rounded. The alpine mountains were composed of hornblende, gabbro, and eklogite, and the grass mountains of schist impregnated with chalk. The highest parts of Swedish Lapland were those around the sources of the river Rapaädnos, the highest top of which, Sarjektjåkko, was once believed to be the highest mountain in Sweden, and west of the Lake Pajtasjärvi, where there are two lofty peaks, Kaskasatjåkko and Kebnekaise. The greatest glaciers in Sweden were found within these parts, the former having been named the "ice-depôt of Lapland." He estimated that about 180 square kilometres, or one-seventh of the whole area, were covered with "eternal" ice, the depth of which reached several hundred feet. It was impossible to say whether the Lapland glaciers were increasing or decreasing. Judging by other European glaciers, they should be decreasing very fast. The fact that the flora of Lapland was actually receding, which pointed in the opposite direction, and seemed to indicate a deterioration of the climate, he believed was due to the circumstance that the Lapland glaciers had an "heirloom from the Glacial Age" still to get rid of. The lakes covered a vast portion of Lapland chiefly between the mountains and the so-called "forest-land." The surface area of the lakes here was one-third of the whole of Swedish Lapland. But there were also many great lakes in the alpine districts. Of the waterfalls the most imposing were the Stora Sjöfall, 130 feet high, and Harsprånget, 70 feet high, and with a volume of water estimated at 500 cubic metres per second. There were besides several beautiful but smaller falls in the Gellivara Lappmark. In conclusion, Prof. von Düben, who has travelled much in Lapland, stated that he believed that the word "Lapp" was derived from the old Finnish word *lappaa*, i.e. "roam about," as suggested by a great authority, viz. Prof. Friis, Professor of Lappish at the Christiania University.

GUIDO CORA's *Cosmos* for 1884 (vol. viii.) contains an attractive paper on Tahiti and the natives of Polynesia, recently visited by Dr. Filippo Rho of the Italian Royal Marine, who

sailed from Callao for the Pacific waters on board the *Caracciolo* in June, 1883. The "Kanaka," or Polynesian race proper, is described as presenting many points of resemblance to the Malays, from whom the writer supposes them to have originally sprung. But the type can be best studied in Tahiti and the other eastern islands of the Pacific, where it is found in its purest state and least affected by Papuan elements. It is subdolichocephalic, with cephalic index 76.2 ; keel-shaped skull; mesorhine nose (index 49.3); not prognathous if unmixed, although in Tahiti the facial index is 75.0 , and in general conformation not far removed from the white or European type. The nose, sometimes straight, sometimes aquiline, sometimes rather short and flat, is always characterised by wide nostrils. The jaw-bones, though strong, are not prominent; face oval; eyes black, well shaped, never oblique; complexion variable from light brown or copper to olive yellow, but always fairer than that of the Malays; hair black, often coarse, generally straight, but sometimes wavy; beard scant; stature very tall and slim, although a tendency is shown here and there towards obesity. The Tahitians are of a cheerful temperament, passionately fond of song and dance, and some favourable specimens are given of their *himené*, a term derived from the English word "hymn," a relic of the days of the Protestant missionaries before the French occupation. These *himené* are chiefly historical, religious, warlike, or amatory, the latter often extremely pathetic, as, for instance, the elegy of the distressed maid, who flies to the woods, crowns herself like Ophelia with flowers, and dies with the name of her faithless lover on her lips. "I turn weeping from side to side of my grassy couch; alas! he is away! we are severed for ever, and I alone keep my love. I stand in the shade of the Tu tree, and wreath myself in the flowers he loved, to bear the grief of my beloved who has forsaken me. Thou forsakest me, never to return, and I die alone like the bird that finds no branch of any tree whereon to perch." There is an amusing description of Queen Marau's visit to the Italian man-of-war, whose officers were afterwards invited to a banquet, the *menu* of which is given in Tahitian and Italian. It began with roast pork, followed by raw fish *à la taïero* (a kind of pickle made of grated coco, sliced lemons, and salt water kept in a bamboo cane), prawns, salt fish, bananas, taro, a species of mango (*Spondias dulcis*), concluding with a dessert of cocoa-nuts and oranges. A native banquet is thus a sort of *résumé* of the fauna and flora of the Society Islands.

THE *Bollettino* of the Italian Geographical Society for April publishes two interesting letters from the engineer, Count Augusto Salimbeni, who had accompanied the third Bianchi expedition to Gojam, which had such a disastrous termination. These letters, addressed to Sig. Grimaldi, Minister of Agriculture, and to Prof. Tacchini, are dated from Dildil-Jimma, Gojam, December 27, 1884, and January 2, 1885, and describe the commencement of a stone bridge over the River Temcha, the first of the kind in the country since that thrown some two centuries ago across the Abai (Upper Blue Nile) by the Portuguese. This work, so far carried out under great difficulties with the assistance of Giuseppe Andreoni from the Swiss Canton of Ticino, will consist of three arches with a total length of 50 m. and 20 m. above the stream. King Tekla-Haimanot, at whose request it was undertaken, was greatly surprised at the progress already made, and expressed his satisfaction to Count Salimbeni in these terms:—"At first I did not believe you. But it was not altogether my fault. Europeans coming here have talked to me about the splendours of their lands, have brought me handsome presents, but have never shown me any of their works in stone and mortar. Our history relates how the Portuguese, to build the bridge over the Abai, brought down fire from heaven, with which they dammed up the water. It is also said that they required a thousand oxen daily to mix the mortar. But you have asked for nothing but stones, sand, wood, and water. Your work is better than that of the Portuguese. Now I believe you." It was expected that the bridge would be finished in March.

THE same number of the *Bollettino* brings to a conclusion the important and timely paper by L. Paladini on the foundation of European colonies in Africa, and especially in Algeria and Tunis. The object of the writer is to warn Italy against rash enterprises of this sort, nearly all of which have hitherto proved to be financial and even political failures. Speaking more particularly of Algeria, he describes the results, after fifty-four years of occupation, as almost nothing compared with the vas