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 $\left\{\frac{\text{moderately}}{\text{very}}\right\}$ mild winter will most probably be succeeded by a $\left\{\frac{\text{cool}}{\text{hot}}\right\}$ summer. (2) A $\left\{\frac{\text{moderately}}{\text{very}}\right\}$ hot summer will most probably be succeeded by a $\left\{\frac{\text{moderately mild}}{\text{cold}}\right\}$ winter. (3) A $\left\{\frac{\text{moderately}}{\text{very}}\right\}$ cold winter will most probably be succeeded by a $\left\{\frac{\text{cool}}{\text{cold}}\right\}$ 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 (*Hapale jacchus*) from Brazil, presented by Miss Henderson; a Cereopsis Goose (*Cereopsis novæ-hollandiæ*), 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 (*Mareca 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* G.M.T. | Angle | *Reappearance* 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 |
| Dunecht ... | 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 h. m. | Souths h. m. | Sets h. m. | Decl. on meridian ° ′ |
|---|---|---|---|---|
| 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.