quickly by an electric field. In the former case saturation currents can be obtained, in the latter the current increases indefinitely with the voltage applied. In either case the conductivity of the surrounding gas increases rapidly as its pressure is diminished.

UNDER the title of "First Report of the Bird Construction Committee," the Aëronautical Society of Great Britain has issued an attractive pamphlet, in which it is sought to summarise existing knowledge of the mechanical constants associated with the flight of birds. A special feature is the tabulated list of about 460 species of bird with numerical values of their wing dimensions, weights of their muscles, and similar data, compiled from the works of Harting, Marey, Moillard, Mullenhof, Legal and Reichel, and Winter. To the ornithologist, the list of Latin names with their equivalents in English, French, German, Italian, Spanish, and Russian will be exceedingly useful. Another pamphlet dealing with natural flight is Dr. Wolfgang Ritter's study of "The Flying Apparatus of the Blow-fly," published by the Smithsonian Institution (1911). For the first time in this connection, photography was used to delineate the structure of the wings and arrangement of the thoracic muscles, most of the illustrations being stereoscopic. Other figures give kymographic curves showing the movement of the wings, and serial photographs of the insect in the act of flight. Natural flight also figures in a pamphlet by Dr. Otto Wiener entitled "Vogelflug, Luftfahrt und Zukunft" (Leipzig: Johann Ambrosius Barth, 1911, pp. 60), based on the author's contributions to the *Deutsche Revue*. In addition, however, to sailing and other flight, the article deals with the influences of artificial flight in peace and war, its future effects on human progress, and other considerations of an equally general character.

OUR ASTRONOMICAL COLUMN.

THE ECLIPSE OF THE SUN, APRIL 17, 1912.—Next year's eclipse of the sun, although, under the best conditions, of very short duration, is arousing a great deal of interest owing to the proximity of the central line. It was at first suggested that a very brief totality might occur near Paris, but the slight uncertainty as to the moon's semidiameter makes this doubtful; probably it will be a very large annular eclipse there. According to the data of the *Connaissance des Temps* a six seconds' totality should occur in Spain, but according to those of *The Nautical Almanac* the eclipse will not become more than annular anywhere.

In the June number of *L'Astronomie* M. Landerer discusses the conditions for Spain, and, taking the moon's semidiameter as 15' 31·62", he finds that at one or two places in the peninsula an evanescent totality should occur. At El Barco (Orense) the eclipse path should have a diameter of 166 metres, and totality should last for 0·2s., so that an intending observer would have to make very sure of his position. Between El Barco and Penafiel (near Oporto) would probably prove a better station, the computed totality at the latter place being 0·4s. For Castandiello, a small village in the province of Oviedo, the computed magnitude is 0·9999, and the eclipse may easily prove total. All the places are shown on a map accompanying the article, and a special article dealing with the conditions for eclipse in France is promised in the next number.

THE CHANGES ON JUPITER, 1881–1909.—An important monograph of 180 pages discussing the features of Jupiter during the period 1881–1909 is contributed by Dr. O. Lohse to vol. xxi. of the *Publikationen des Astrophysikalischen Observatoriums zu Potsdam*, No. 62.

The observations of the various spots, bands, and other surface features of the planet are discussed individually, and the descriptions often illustrated by a sketch of the special feature made at the time of observation. Measures of the equatorial and polar diameters were frequently made with a filar micrometer, and are tabulated and discussed for each opposition. For the mean values Dr. Lohse obtains 38·343" ± 0·059" for the equatorial, and 36·031" ± 0·044" for the polar, diameter; the ratio expressing the amount of flattening is 1/16·584.

The changes in various features and many other interesting points are discussed, and the monograph concludes with twelve excellent plates, eleven reproducing drawings of the planet and the twelfth showing the normal joviographic longitudes of the Red Spot during the period 1879–1909.

BARNARD'S COMET, 1892 V.—The third return of Barnard's 1892 comet is due this year, and if the period lies between 6·23 and 6·52 years, as given by two of the three sets of elements prepared by M. J. Coniel, there is a chance of its being rediscovered.

To facilitate the search, M. Coniel publishes a comprehensive ephemeris in No. 4504 of the *Astronomische Nachrichten*, which is based on the assumption of a period equal to 6·37 years, and shows the places (for 1911) week by week from July 1 to the commencement of 1912.

THE MOTION OF THE POLE.—The provisional report of the results obtained by the International Latitude Service, for 1910, is published, as usual, by Prof. Th. Albrecht in No. 4504 of the *Astronomische Nachrichten*. The figure accompanying the paper shows that practically since 1906·1 the swing of the momentary, from the true, pole has been increasing; the curve for 1910·0–1911·0 encircles the previous spiral curve described since 1900·0. The x and y values (extrapolated) for 1911·0 are +0·002" and −0·282" respectively.

THE PROPER MOTIONS OF THE STARS.—Several interesting conclusions are deduced by Dr. Oppenheim in a paper wherein he subjects to harmonic analysis the proper motions of the stars between declinations +38° and +65° given in the Greenwich new reduction of Groombridge's catalogue of circumpolar stars. He finds that the motion of the stars into swarms along definitely directed "highways" is not finally established, and that their motions can be accounted for analytically by assuming a relative motion analogous to the geocentric paths of the minor planets, but he leaves the question of an ideal central body open (*Astronomische Nachrichten*, No. 4497).

STELLAR PARALLAXES.—More stellar parallaxes are given by Dr. Schlesinger in No. 4, vol. xxxiii., of *The Astrophysical Journal*. Seven stars are considered, and of these four have positive parallaxes greater than 0·1". Among the latter, one of special interest is the well-known star Positiones Mediæ 2164, otherwise designated *Struve* 2398. The distance separating the components is now 17", having increased nearly 5" since the double was first measured by Struve in 1832. Recent measures show that the pair has a comparatively rapid orbital motion considering the great separation and the faintness of the components. Dr. Schlesinger finds the parallax to be +0·282" ± 0·003", and his results are so concordant, *inter se* and with independent determinations, that he considers that there are few stars the distances of which from us are known with so small a probable error.

POSITIONS OF STARS IN THE HUYGHENIAN REGION OF THE ORION NEBULA.—As a Bulletin of the Philosophical Society (University of Virginia), vol. i., No. 4, Mr. Ralph E. Wilson publishes newly determined positions of a number of stars in the Huyghenian region of the Orion nebula. After reviewing the earlier work on the subject he gives his measures in detail; all the measures were referred finally to Bond's No. 628, but Nos. 558, 669, and 685 were also employed as fundamental stars. Six stars show what appears to be proper motion, which in the case of Bond's 612 and 618 amounts to 4" or 5" a century northwards. The motions of 622 and 636 can be explained by the supposition that they are physically connected with the trapezium and share its motion. In the cases of Nos. 686 and 688, the proper motions are affected by large proper motions, or Bond's positions are erroneous; observations in ten years' time would probably settle this point.