

MARS AND SATURN.—M. Jarry-Desloges reports (*Astronomische Nachrichten*, No. 4549) that the southern white polar cap on Mars appears to be reforming, particularly on Thyle I., and that the insular area which he reported to the west of Novissima Thyle is still apparent, and forms a background to the dark, sharply defined M. Australe.

On Saturn he has remarked many changes in the southern regions. The dark polar cap has not been seen again, but the pole is occupied by a bright area surrounded by a very thin dark band; three other bands were also seen on the disc.

SEARCH-EPHEMERIDES FOR WESTPHAL'S COMET, 1852 IV.—The period for Westphal's 1852 comet is rather uncertain, but, according to a new calculation by Dr. Adolf Hnatek, which is published in No. 4549 of the *Astronomische Nachrichten*, it is not unlikely that perihelion will be reached in October of this year.

This is on the basis that the period is sixty years, but Dr. Hnatek gives search-ephemerides, for the first half of this year, taking 60.0, 60.1, 60.2, 60.3, 60.4, 60.5, 61.0, 61.5, and 62.0 years as the period; for the first six values the computed brightness, on June 19, would lie between magnitudes 7.5 and 10.0, but until later in the year the comet is considerably south of the equator.

OBSERVATIONS OF JUPITER'S GALILEAN SATELLITES.—In Circular No. 12 of the Transvaal Observatory, Mr. Innes records a large number of eclipses, transits, &c., of the four Galilean satellites of Jupiter, and gives some interesting notes concerning the more uncommon phenomena observed. On April 4, 1911, a partial transit of J. III. was observed, and Mr. Innes remarks that the possibility of a partial transit does not appear to have been recognised hitherto. A table is given showing the differences between the observed times and those computed by Dr. de Sitter, those given in the "Nautical Almanac," and those computed from Prof. Sampson's tables; the differences range between -0.6 and -12.5 minutes. Peculiar shapes of the satellites and their shadows, e.g. the shape of a figure 8, were noted during several transits, and on May 24, 1911, before the commencement of the ingress of a transit by J. III., a bright spot, with a dark band skirting it on the south side, was seen in the N.f. quadrant of the satellite.

STAR CALENDARS, CHARTS, AND GUIDES.—From the publishers we have received copies of the H.P.H. series of annuals. The "Star Calendar" for 1912 is an improvement on that of former years, and has the aperture, which enables the star chart on the under card to be seen, oval instead of circular; the price is 1s. net. The "Star Almanac," 6d. net, is, as in previous years, intended to display on the observatory or study wall, and it contains a large amount of useful information. A number of notes discuss the æther, the corona, &c., and in addition to four circular star charts there are reproductions of Father Cortie's 1905 corona and Max Wolf's photograph of the North America nebula. The above are published by Messrs. Simpkin, Marshall and Co., Ltd.

In "Stars and Constellations: a Little Guide to the Sky," Miss Agnes Fry describes the constellations and their relative positions, &c., in rhyme. For the instruction of young people the work will probably prove useful, and may be obtained from the publishers, Messrs. Baker and Son, Clifton, price 6d. net.

### RECENT EARTHQUAKES.

SEVERAL shocks, supposed to be due to earthquakes, were felt in this country towards the end of last week. On January 26, at 4 a.m., a shock was felt at Dunblane strong enough to awaken sleepers, but not strong enough to affect the Milne seismograph at the Royal Observatory, Edinburgh. On January 28, at about 3.35 a.m., a tremor was felt in Glenfruin, a valley lying between the Gareloch and Loch Lomond. Early in the morning of January 26 there were three distinct shocks in the colliery district of Llanhilleth, in Monmouthshire, strong enough to make the miners leave their work. On January 20, shortly before 2 a.m., a sharp tremor was felt at Lennoxton and Campsie, in Stirlingshire, again without affecting the Edinburgh seismograph. Of the four disturbances, the

first two were apparently of seismic origin. Dunblane lies close to the district on the south side of the Ochil Hills, where so many earthquakes have resulted during the last twelve years from slips of the great fault which forms the southern boundary of the hills. The Glenfruin shock seems to be a successor of two other earthquakes in the same part of Scotland—the Dunoon earthquakes of September 18, 1904, and July 3, 1908. The Llanhilleth and Lennoxton shocks bear a close resemblance to those which are often felt in colliery districts, and which are probably caused by small fault-slips precipitated by the working in the mines.

A severe earthquake occurred at 6 p.m. on January 24 in the island of Cephalonia, which, with the neighbouring islands of Zante and Santa Maura, forms one of the most important seismic zones in Europe. Buildings in Argostoli, the capital, were injured; considerable damage was caused in the villages at the southern end of the island, as well as in the island of Zante. The villages in the north-east of Cephalonia seem to have suffered most. Altogether, five villages are reported as destroyed and eight persons as killed. Though hundreds of shocks have been felt in the district during the last twenty years, the earthquake of January 24 is apparently the most severe since the disastrous Zante earthquakes of January 31 and April 17, 1893.

The director of the Meteorological Office reports that on January 25 he received a telegram from the superintendent of the Eskdale Observatory, in Dumfriesshire, as follows:—"Fine earthquake 24th at 16½ hours 3000 km. S.E." More exact measurements of the records have given the epicentre as 2570 kilometres distant, 56° 34' E. of S., that is, at lat. 39° 16' N., long. 21° 53' E. The position of the earthquake is thus placed in S.W. Thessaly, near the border between Turkey and Greece, so that the Eskdale record would appear to have been derived from the earthquake in Cephalonia referred to above.

### A NEW SYSTEM OF GUN SIGHTING.

THE new Remington negative angle system of sighting, which formed the subject of a lecture by Sir George Greenhill, F.R.S., to the Junior Institution of Engineers on Friday, January 19, is the invention of Mr. H. Ommundsen, worked out and applied to military and sporting rifles in collaboration with Mr. E. Newitt. The invention has for its object the elimination of the necessity for judging distance in sport and war by making use of the visual angle which proceeds from the shooter's eye and embraces the object aimed at. By inverting the back-sight, making it so that the object can be seen under it instead of over, as at present, the object can be callipered visually between the fore- and back-sight. The magnitude of the visual angle varies inversely with distance, and the further off the object is the smaller will be the visual angle, and consequently the higher the foresight has to be raised in order to calliper the object, the result being a suitable automatic increase of elevation. This automatic variation of elevation may be obtained simply by selecting a point of aim at a predetermined depth below the objective. This predetermined depth creates a visual angle, which varies in precisely the same way as above described, and being below the objective the angle automatically subtracts from the fixed angle of elevation on the rifle, and is thus called the "negative angle." The fixed angle of elevation on the rifle is calculated beforehand to give appropriate results within limits which depend upon the power of the cartridge. Applied to sporting rifles, the negative angle sight gives astonishing results. With the comparatively old 0.303 deer-stalking rifle, or with, say, the 0.400 big-game rifle, animals can be shot through the heart at any distance between, say, 30 and 230 yards, without in any way altering the aim or adjusting the sight. Some tests have been carried out by the Remington Arms-U.M.C. Company, of New York and London, who have acquired the whole patent rights. In the military tests the skirmishing results bounded up from less than 20 per cent. under the old style of sights to 95 under the negative angle method. On "stag" targets with the ordinary 0.303 sporting rifle, 7-inch "heart" groups were made with unflinching regularity at varying distances between 50 and 250 yards.