

every 200 metres of height of the mountains. The heat thus gained is liberated in the condensation of the vapour. I believe this is satisfactory as regards the *Foehn*.

But this will not account for a rise of the temperature of Southern Greenland from its mean December temperature, which, according to Dove's map, is below freezing, to 14° C. A rise of 14° C. would require, according to the above law, a mountain chain 2,800 metres, or about 8,000 feet in height, and there is none in Greenland approaching this.

I used to think that great rises of temperature in the Arctic winter were due to the wind tearing up the frozen surface of the sea, and liberating the heat of the water below; but this will not account for an increase of temperature above freezing. I have no explanation to offer.

JOSEPH JOHN MURPHY

Old Forge, Dunmurry, Co. Antrim, August 13

Does Sunshine Extinguish Fire?

It is a popular belief that a fire will not burn if exposed to the sun, and, from all I have observed, it seems well founded. Can any of your readers favour me with an explanation of the phenomenon, if true; or is it a mere superstition?

Schwarzwald, August 11

CHARLES WATSON

OUR ASTRONOMICAL COLUMN

THE OPPOSITION OF MARS, 1877.—The present opposition of the planet Mars offers conditions so nearly analogous to those of the opposition in 1862, that the many fine drawings made in that year, a number of which are contained in vol. xxxii. of the "Memoirs" of the Royal Astronomical Society, become available for comparison with such as may be made during the actual opposition. The same hemisphere of the planet is presented to the earth, and our depression from the martial equator is sensibly the same; thus, at opposition in 1862 the angle of position of the visible (southern) pole was 145°·3 and the earth's depression -22°·7, while at the opposition of 1877 the figures are respectively 160°·3 and -22°·5. The least distance of Mars from the earth in 1862 was 0·406, while in 1877 it is 0·377.

Notwithstanding Secchi observing in 1858 found the features upon the disc of Mars irreconcilable with those delineated in Mädler's drawings made under similar circumstances in 1830, it was sufficiently evident at the opposition of 1862 that these differences are to be attributed to the temporary conditions occasioned by clouds of varying density, form, and extent, in the atmosphere of the planet itself, heightened perhaps in some degree by the state of our own atmosphere at the times of the observations. A striking instance in support of this conclusion was afforded by Mr. Lockyer's observations on September 25, 1862. At 10h. 44m., when his drawing No. 14 was completed, the well-known spot *a* of Mädler was quite invisible, while when No. 15 was made shortly afterwards, this spot was "among the most prominent features upon the planet's disc."

There would appear now to be little doubt that the green and red portions of the disc do really represent seas and continents, and are not due to the effect of contrast, another explanation which has been suggested. During the actual favourable appearance of the planet, we may expect that measures will be made which will admit of a closer determination of the position of the axis of rotation than any yet obtained. The results at present upon record are (1) Sir W. Herschel's, which assigns for the longitude of the ascending node of the equator of Mars upon his orbit, 79° 27' for 1872, and for the obliquity of his ecliptic 28° 42'. The reduction by Oudemann's of Herschel's measures, make these figures 79° 18' and 20° 53' respectively; (2) Schroeter's, as given by M. Terby, which places the south pole in 172° 54'·7, with latitude 60° 33'·2, whence we find for 1798, longitude of ascending node of equator on orbit, 84° 54', obliquity of ecliptic 27° 57' for 1798; and (3) Oudemann's reduction of Bessel's

measures with the Königsberg heliometer, made September 28, 1830, January 21, 1835, and February 11, 1837, giving for the place of the ascending node 80° 50', and for the obliquity 27° 17' for 1834. With the last values which have been generally adopted, we have for the ascending node of the equator of Mars upon the earth's equator (N), and its inclination thereto (I):—

$$N = 47^{\circ} 42' + 0^{\circ} 50' (t - 1850)$$

$$I = 39^{\circ} 52' - 0^{\circ} 25' (t - 1850).$$

The following table showing the angle of position of the visible pole of Mars, and the elevation of the earth above the plane of his equator, at the oppositions between 1850 and 1880, has been calculated from the above elements, and may be of interest to some readers; the least distance of Mars from the earth is added:—

Date of opposition.	Position of visible pole.	Elevation of earth.	Least distance of Mars.
1852, Jan. 24 ...	23 16 ...	9 8 N.	0·660
1854, Feb. 26 ...	343 46 ...	22 6 N.	0·675
1856, April 2 ...	35 2 ...	23 30 N.	0·625
1858, May 15 ...	40 45 ...	12 4 N.	0·514
1860, July 17 ...	192 34 ...	10 47 S.	0·391
1862, Oct. 5 ...	145 17 ...	22 42 S.	0·406
1864, Nov. 30 ...	142 37 ...	6 29 S.	0·534
1867, Jan. 10 ...	343 54 ...	10 24 N.	0·636
1869, Feb. 13 ...	7 37 ...	21 40 N.	0·677
1871, March 19 ...	28 35 ...	24 53 N.	0·636
1873, Feb. 13 ...	41 2 ...	17 59 N.	0·563
1875, June 19 ...	209 7 ...	0 51 S.	0·433
1877, Sept. 5 ...	160 14 ...	22 31 S.	0·377
1879, Nov. 12 ...	138 48 ...	13·54 S.	0·482

A glance at this table exhibits a well-known condition that when Mars is nearest to the earth and when we have consequently the best opportunities of studying the features upon his disc, his southern hemisphere is always directed to the earth, and hence we are likely to be better acquainted with that hemisphere than with the northern one, which is turned towards the earth only at the greater distances of Mars.

THE SATELLITES OF SATURN.—A series of observations of all the eight satellites of Saturn by Prof. Asaph Hall, dated from Washington in December, 1876, has at last made its appearance in No. 2,145 of the *Astronomische Nachrichten*.

SATELLITES OF MARS.—A telegram from the Smithsonian Institution to M. Leverrier, received August 19, notifies the extraordinary discovery of two satellites of Mars by Prof. Asaph Hall, of the U.S. Naval Observatory at Washington. The telegram runs thus: "Two satellites of Mars by Hall at Washington, first elongation west, August 18, eleven hours, Washington distance, eighty seconds, period thirty hours, distance of second, fifty seconds."

THE BRITISH ASSOCIATION

PLYMOUTH, Tuesday

THE Plymouth Meeting of the British Association has not realised, as far as numbers are concerned, the success which we anticipated last week, and which was indicated by the business done on the days immediately preceding the opening of the meeting.

The attendance of the regular members from a distance has been very good indeed, and can compare favourably with meetings that have gone before it, but the visit of the British Association, while opening wide the gates of hospitality of the people of Plymouth, does not seem to have awakened the scientific interest of the community sufficiently to cause many to enlist in its ranks. It is seldom that so small a number of local members have been added to the list