

the photographs, cannot be regarded as final, since, amongst other reasons, the reduction of the position-angles of Venus is yet unfinished.

THE MARKINGS ON MARS.—Observations of Mars more recently published tend to throw doubt upon the "inundation of Libya," which M. Perrotin reported some four or five months ago. Not only were Prof. Schiaparelli and Dr. Terby unable to confirm his statement, but M. Niesten at Brussels, and Prof. Holden at the Lick Observatory, failed to remark this change. The observations of Prof. Holden and his assistants did not begin until July 16, and were continued until August 10. The planet was therefore very unfavourably situated when they were made, since the diameter of the planet was always less than 9", and its zenith distance about 60°. Several of the more important canals were seen, but they were not seen double, but appeared rather "as broad bands covering the spaces on M. Schiaparelli's map which are occupied by pairs of canals, and by the space separating the members of each pair." M. Niesten also seems to have failed to see the gemination of the canals, but, in common with other observers, was much struck by the whiteness and brilliancy of some portions of the planet, particularly of *Elysium* or *Fontana Land*, as it is called by Mr. Green. The brightness of Fontana Land has been commented on both by M. Perrotin and Prof. Schiaparelli, and the former observer has recently delineated an intricate network of canals between that district and the north pole, and another yet more complicated on the *Madler Continent*. Prof. Schiaparelli has had to chronicle still stranger changes in this last-named district, which he observed on May 20 under specially favourable circumstances, having been able to distinguish the two banks of some of the canals, the one from the other, and to detect very small undulations in them. He speaks also of the ordinary markings, of gulfs, canals, &c., as disappearing at a given moment, for their places to be taken by grotesque polygons and geminations "which evidently approximately represent the earlier state; but it is a gross, and, I should say, an almost ridiculous mask."

ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 OCTOBER 21-27.

(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 October 21

Sun rises, 6h. 37m.; souths, 11h. 44m. 35'2s.; sets, 16h. 52m.; right asc. on meridian, 13h. 46'0m.; decl. 10° 57' S. Sidereal Time at Sunset, 18h. 54m.
Moon (Full on October 19, 21h.) rises, 17h. 43m.*; souths, oh. 40m.; sets, 7h. 50m.; right asc. on meridian, 2h. 39'3m.; decl. 10° 28' N.

Planet.	Rises.			Sets.			Right asc. and declination on meridian.	
	h. m.	Souths.	h. m.	h. m.	Souths.	h. m.	Decl.	
Mercury..	8 41	12 56	17 11	14 57.7	19 59	S.		
Venus ...	9 13	13 30	17 47	15 31.9	19 38	S.		
Mars ...	12 11	15 52	19 33	17 54.1	25 2	S.		
Jupiter ...	10 10	14 19	18 28	16 20.4	20 58	S.		
Saturn ...	23 58*	7 26	14 54	9 26.3	18 58	N.		
Uranus...	5 37	11 7	16 37	13 8.5	6 37	S.		
Neptune..	18 14*	2 0	9 46	4 0.1	18 50	N.		

* Indicates that the rising is that of the preceding evening.

Occultations of Stars by the Moon (visible at Greenwich).

Oct.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.	
					h. m.	h. m.
23 ...	δ ² Tauri ...	6	2 53	3 59	156	274
24 ...	χ ¹ Orionis ...	4½	21	21 56	39	264
27 ...	B.A.C. 2854 ...	6	21 59	22 51	46	239

Meteor-Showers.

	R.A.	Decl.	
Near ν Orionis ...	90	15 N.	The <i>Orionids</i> .
From Canis Minor ...	105	12 N.	Swift; streaks.
„ Cancer ...	133	21 N.	Very swift.

Star.	R.A.		Decl.		Oct.	h. m.	m.
	h. m.	°	h. m.	°			
U Cephei ...	05 24	81	16 N.	...	21,	2	51 m
Algol ...	3 09	40	31 N.	...	25,	2	51 m
S Aurigæ ...	5 19.7	34	3 N.	...	27,	23	40 m
R Canis Majoris...	7 14.5	16	12 S.	...	24,		M
S Hydræ ...	8 47.7	3	30 N.	...	23,	1	59 m
U Ophiuchi...	17 10.9	1	20 N.	...	23,		M
R Scuti ...	18 41.5	5	50 S.	...	21,	20	32 m
η Aquilæ ...	19 46.8	0	43 N.	...	26,	21	19 m
S Sagittæ ...	19 50.9	16	20 N.	...	25,		m
S Delphini ...	20 37.9	16	41 N.	...	24,	9	0 m
T Vulpeculæ ...	20 46.7	27	50 N.	...	23,	1	0 m
Y Cygni ...	20 47.6	34	14 N.	...	26,	1	0 M
R Vulpeculæ ...	20 59.4	23	23 N.	...	26,		M
T Cephei ...	21 8.1	68	2 N.	...	23,	0	0 m
δ Cephei ...	22 25.0	57	51 N.	...	23,	3	0 m

M signifies maximum; m minimum.

GEOGRAPHICAL NOTES.

To the October number of *Petermann's Mitteilungen*, Dr. J. Hann contributes an important paper, containing a *résumé* of data on the temperature and rainfall of the Japanese islands, and Dr. F. Boas a paper of a similar character on the ice conditions of the south-west of Baffin's Bay.

CAPTAIN WIGGINS has failed to accomplish the voyage to the Yenissei along the north coast of Europe and Asia—mainly, it would seem, on account of the delay caused by his having to wait for another vessel from Europe. Dr. Torell, the well-known Swedish Arctic explorer, who is well acquainted with these seas, maintains that there should be no difficulty in establishing a regular communication between Europe and Siberia along the north-east passage, though he admits that it would be liable to interruption about once in five years. But in order to insure success he states that vessels should be built specially for the work, and that they should go out early in summer and take up their post on the west side of Matotshkin Scharr, in Novaya Zemlya, to be ready to enter the Kara Sea as soon as ever it begins to clear of ice. A railway across Siberia, however, should serve to render any such hazardous trade-route unnecessary, and such a railway is sure to be constructed soon.

A CENSUS of the illiterates in the various countries of the world recently published in the *Statistische Monatschrift*, places the three Slavonic States of Roumania, Servia, and Russia, at the head of the list, with about 80 per cent. of the population unable to read and write. Of the Latin-speaking races, Spain heads the list with 63 per cent., followed by Italy with 48 per cent., France and Belgium having about 15 per cent. The illiterates in Hungary number 43 per cent., in Austria 39, and in Ireland 21. In England we find 13 per cent., Holland 10 per cent., United States (white population) 8 per cent., and Scotland 7 per cent. unable to read and write. When we come to the purely Teutonic States, we find a marked reduction in the percentage of illiterates. The highest is in Switzerland, 2.5; in the whole German Empire it is 1 per cent.; in Sweden, Denmark, Bavaria, Baden, and Württemberg, there is practically no one who cannot read and write.

IN the October number of the Proceedings of the Royal Geographical Society, the Shah of Persia appears as a geographer. In a paper, annotated by General Houtum-Schindler, His Majesty describes simply, but clearly, the results of his own observations on a new lake, between Kom and Teheran, or rather the reappearance of an old lake, which is said to have dried up in 1357. Whatever may be the history of the lake, there seems little doubt that at one time a large part of Central Persia was covered with water. Mr. H. H. Johnston contributes a short study, from his own observations, of what he calls the Bantu Borderland in West Africa, which is accompanied by a map showing the boundaries of the Bantu and Semi-Bantu races, and also the courses of migration of the two. Another important paper, accompanied by a map, is a translation, by Miss Hay, of Tashkent, of a description of the destructive earthquakes of May and June 1887, in the Vernoe district of Russian Turkestan. Captain Wharton's paper on Christmas Island is given at length.