

dust-cloud. The spots observed on Jupiter's surface are next dealt with, a table of their rotation periods and latitudes being included. From the latter he deduces that the mean periods of rotation of matter in the following latitudes are:—

Lat.	h.	m.	s.
12° N. from 17 N. Temp. spots	9	55	36.49
4° N. „ 5 N. Equat. „	9	50	40.06
8° S. „ 21 S. Equat. „	9	50	22.4
30° S. „ 3 spots	9	55	17.1

In treating of the spots themselves, he suggests that those which are of a white appearance are gyrating uprushes of warm air from the lower regions, while the dark ones are simply descending columns of cool air, “the two forming parts of the system of vertical circulation.” The red spot, he suggests, is caused by a local escape of internal heat, the repellent force it appears to possess being due to the “spreading of the heated currents as they rise.” He explains the retardation and acceleration of its period of revolution by the increasing force of the west winds, brought about by the exposure of the southern hemisphere during Jupiter's half-year (5.93 of our years); in this way the spot is sometimes situated over and sometimes to one side of the source of heat underneath. The author also deals with other spots in a similar manner.

GEOGRAPHICAL NOTES.

MR. SVEN HEDIN'S account of his ascent of Mount Demavend is published in the last number of the *Verhandlungen* of the Berlin Geographical Society. Demavend is a volcanic peak rising abruptly from the sedimentary rocks of the parallel Elburz chains. Starting from the village of Kanah on the south-eastern slope with two guides on July 10, 1890, Hedin reached the summit on the afternoon of the next day. On the summit a large elliptical crater was found; the edges of which were strewn with blocks of porphyritic lava and sulphur. After discussing the aneroid and boiling point observations, Mr. Hedin arrived at 5465 metres (17,930 feet) as the height of the summit. This is lower than any of twelve earlier estimates which are cited, the highest of them being 6559 metres.

THE Italian possession of Eritrea on the coast of the Red Sea gives some promise of becoming useful agriculturally. Several small settlements of Italians on the plateau have succeeded in growing large crops of wheat and barley, and only the unsettled state of the surrounding natives threatens the prosperity of the farmers. The districts of Oculé-Cusai and Guro are already fully cultivated, and Sararé, as yet almost unoccupied, has fertile land and plenty of room for colonists. The Italians are able to work in climatic conditions which would rapidly exhaust the natives of northern Europe.

THE general summary of Mr. Conway's expedition in the Karakoram range telegraphed from India (p. 525) has now been supplemented by a full narrative, written to the secretaries of the Royal Geographical Society from a camp on the Baltoro Glacier on August 29, with a postscript added at Skardo, on the way to Leh, on September 12. The difficulties of the preliminary journey were very great, not the least being the fording of several swollen glacier streams by a party numbering four Europeans, four sepoy, seventy coolies, an indefinite number of followers, and flocks of goats and sheep. The moraines on the Baltoro glacier were of almost incredible extent; for two-thirds of its entire length the ice is entirely concealed by stones, except where crevasses or lakes occur, and the irregularity of the surface made travelling extremely slow. Mr. Conway limits the name of Godwin-Austen to the highest peak of “K<sub>2</sub>,” giving to the whole mountain the somewhat cumbersome title of the Watch Tower of India. One branch of the Baltoro Glacier results from the union of seven glaciers from this mass; the larger branch descends from the snow-swathed, throne-shaped mountain, hitherto unmapped, for which the auriferous quartz found in its rocks suggested the name of The Golden Throne. This was fixed upon as the goal to be attained. The first attempt landed the Europeans and Ghoorkas, who made excellent climbers, on Crystal Peak, 20,000 feet in elevation, a peak as hard to climb as the Matterhorn, and isolated from the surrounding higher summits. No inconvenience was felt from the rarity of the air, and the party remained on the summit for an hour and a quarter. In the grand attempt on the Golden Throne serious difficulty was en-

countered from the terrible extremes of heat and cold. The last few thousand feet proved very exhausting; one of the Ghoorkas had to be left behind, suffering from mountain-sickness. Every step had to be cut in hard ice. Finally the summit was reached at an elevation of 23,000 feet; but the Golden Throne stood revealed much higher, and separated by a deep depression. From the summit of Pioneer Peak, probably the highest yet reached by man, a series of photographic views was obtained and prismatic compass bearings taken to the surrounding features. As long as the party were at rest they felt no discomfort, but the sphygmograph showed that the heart's action was very laboured. A stay of an hour and a quarter was made on the summit, the view from which baffled description. The descent was safely made, but fatigue and bad weather stopped further exploration.

THE INSTITUTION OF MECHANICAL ENGINEERS.

ON the evenings of Wednesday and Thursday of last week, the 26th and 27th ult., an ordinary general meeting of the Institution of Mechanical Engineers was held in the theatre of the Institution of Civil Engineers, by permission of the council of the latter Society. The President, Dr. William Anderson, occupied the chair during the proceedings.

There were two papers on the agenda. The first was the report of the Institution's committee appointed to enquire into the value of the steam jacket. Mr. Henry Davey is the chairman of this committee, and he had prepared the report; which is a bare record of facts without comment, and in this respect is, we think, defective. Numberless experiments have been made in time past as to the value of the steam jacket, and those now added by the labours of the committee do not largely differ from many that have gone before. We take it that the general opinion of competent engineers is that an advantage in efficiency is to be obtained by jacketing engine cylinders in an efficient manner, and cases in which the jacket has not been proved efficient are those in which it has not been properly applied. What was wanted, therefore, was guidance as to the proper method of application, and it is significant that the most help in this direction came, during the discussion, from those who were not members of the committee. Timidity in expressing opinion will be excusably construed as indicating something of incompetence, and if the members are not capable of expressing opinion they are not suitable persons to form a research committee of an important institution. We frame our remarks hypothetically, because, with such names as Unwin, Bryan Donkin, and Mair-Rumley on the title-page, there can be no doubt that the power to afford guidance was present, and for this reason the decision to give only bare fact is the more to be regretted. The general conclusion to be drawn from the experiments, as quoted, is that “the expenditure of a quantity of steam in an efficient jacket produces a saving of a greater quantity in the cylinder.” It does not follow from this that the jacket is always desirable, as the saving may be so small as not to justify the additional complication and increased outlay at first cost. That, however, is a matter upon which steam users must themselves decide upon a commercial basis; and is, of course, outside the province of the committee, but what would have been valued would have been some critical remarks giving guidance as to what goes to constitute the “efficient jacket,” what fresh engineering practice is opened up by the use of the efficient-jacket, and under what conditions it may be most effectually applied.

The first series of experiments quoted were carried out by Mr. J. G. Mair-Rumley, of the firm of James Simpson and Co., of Pimlico, upon a compound jet-condensing beam pumping-engine. The diameters of the cylinders are 29 inches and 47.5 inches, with strokes of 65.1 and 96 inches respectively. Only the body of each cylinder is jacketed, the steam being supplied direct from the boiler at a pressure of 49 lbs. per square inch above atmosphere. Experiments were made both with and without steam in the jackets. The total feed water per indicated horse power per hour when the jackets were not in use was 18.20 lbs., with the jackets in use the corresponding figures were 16.64 lbs., thus showing a percentage of less steam used due to the jackets of 8.6. The quantity of jacket water condensed was 1.20 lbs. per I.H.P. per hour. The boiler pressure here was not high, 49.7 lbs. without and 49 lbs. with jackets.