

OUR ASTRONOMICAL COLUMN.

DISCOVERY OF A NEW SATELLITE TO JUPITER.—A telegram from New York announces that Prof. Barnard, of the Lick Observatory, Mount Hamilton, California, has discovered a fifth satellite to Jupiter. It is of the thirteenth magnitude, with a period of revolution round the primary of 17h. 36m., its distance from the centre of the planet being 112,400 miles.

VARIATION OF LATITUDE.—Dr. Chandler, in the *Astronomical Journal* No. 273, concludes his series of very important articles on the discussion of observations with regard to the cause of the variation of latitude. The material he has used comprises more than thirty-three thousand observations, made in seventeen observatories with twenty-one different instruments, as many as nine distinct methods of observation having been employed. Out of the forty-five series in which these observations are arranged, only three show results which do not harmonize with the general law as stated in the fifth article (see "Astronomical Notes," NATURE, vol. xvi. p. 211). The values of the three come out negative, and as they are numerically small, they can be with justice discarded, for, as Dr. Chandler says, "a mere rejection of a single discordant equation (out of a total number of 427), in two cases, and of two in the third, would convert them into positive values." Instead, then, of the ratio of the difference of the two moments of inertia to the principal one being 1st.18, and perfectly uniform as given by theory, observation suggests the value 0th.85 (for 1875), the motion not being uniform but subject to a slow retardation which "in its turn is not uniform." The first difference was soon found by Prof. Newcomb to be due to a defect in the theory, an allowance of the earth's elasticity not having been taken sufficiently into account, but with regard to the second he urges an objection "on the ground of dynamic impossibility." In such a discussion as this of course an outside opinion cannot be counted of much value, but we quite agree with Dr. Chandler that if an observed fact disagrees with the result of theory, and a flaw is found in the theory, there can be no reason why another observed fact of equal weight, but also in discord with theory, should be regarded as "impossible."

BRIGHT STREAKS ON THE FULL MOON.—In *Astronomische Nachrichten*, No. 3111, Prof. Pickering gives a brief condensed account of the investigation that has been carried out at Arequipa with regard to the systems of bright streaks, especially round prominent craters, that are visible on our satellite at the period of the second and third quarters. The instrument employed was the 13-inch, and the magnification ranged from 450 to 1120 diameters. The chief results noted were:—(1) That the streaks of the systems round many of the large craters are not oriented to the centre of the prime crater, but towards other craters whose dimensions are considerably smaller. (2) These minute craters are extremely brilliant, and rarely exceed one mile in diameter. (3) Some streaks are found to lie across or upon ridges; these are very seldom connected with small craters. (4) In the case of Copernicus, streaks are found to start from craterlets inside the rim and low up the inner side of the walls, and down the other side. The rim of Tycho also contains similar craterlets, but the streaks do not extend very far. (5) A difference in colour was noticed between the streaks systems of Copernicus, Kepler, and Aristarchus, and those of Tycho, the last-mentioned being considered whiter than the others. (6) There are no very long streaks; their general length may be reckoned from ten to fifty miles. What have been previously taken for long streaks are found, by minute observation, to be simply a series of these smaller ones connecting up, apparently, many small craters. That extending from the regions of Tycho across the Mare Serenitatis is so constructed. In seeking an explanation to account for the origin of these bright streaks, Prof. Pickering suggests that if, for example, the craterlets on the rim of Tycho were constantly emitting large quantities of gas or steam, which in other regions was being absorbed, "we should have a wind uniformly blowing away from that summit in all directions." Should other craterlets in the vicinity "give out gases mixed with any fine white powder, such as pumice, this powder would be carried away from Tycho, forming streaks." This hypothesis, besides explaining the presence of the streaks themselves, satisfies very well the fact that they can only be seen after and before the first and last quarter of the moon phase, for it is only at this time that the contrast would be best seen.

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NOVA AURIGÆ.—On the receipt of Mr. H. Corder's information relative to the brightening of Nova Aurigæ, Mr. Espin made an examination of its light on August 21, and found that the star was of the 9.2 magnitude. Since then Prof. Küstner, has also observed it (August 31, 11m. 4 Bonn mean time), and reckoned it to be as bright as on March 21 last. The Astronomer Royal's photographic determination, made on August 30, accounts it to be about the 12th magnitude.

NEW OBSERVATORIES.—Mount Monnier, in the Maritime Alps, has been visited by M. Bischoffsheim and M. Perrotin, with the object of setting up a new observatory. It is proposed to raise on the summit (2800 metres altitude) an observatory, the work of which will be commenced next April. *L'Astronomie* for September also informs us that the Astronomical Observatory of Abbas-Touman (lat. N. 41° 46', long. E. Paris, 40° 32') will be ready for work in a few weeks. The observatory is already installed with a refractor of 29 inches, and as it is situated at a considerable height, it will be used for those special stellar studies which are difficult at Pulkowa, Moscow, and Kazan.

SOLAR OBSERVATIONS AT ROME.—Prof. Tacchini, in the July number of *Memorie della Società degli Spettroscopisti Italiani*, gives in tabulated form the results of the observations made at the Royal College with reference to the prominences seen at the sun's limb during the months of April, May, and June. In the table showing the frequency of these phenomena for every 10° of latitude north and south, we find that the numbers for the three months respectively were 83, 97, and 147 for the north, and 75, 110, and 183 for the south latitudes. This shows an excess of 41 for the south, the zone in which they mostly occurred being (−50°–60°): the zone of greatest frequency for the north was (+60°+70°). The frequency at the equator was comparatively small, 26 and 23 being the numbers recorded for the zone of 10° each side.

GEOGRAPHICAL NOTES.

A REUTER telegram from St. John's, dated September 11, says that the steamer *Kite*, which left that port three months ago to relieve the Peary Expedition, has just arrived there, after having successfully accomplished its object. Lieutenant Peary, who is an engineer in the United States Navy, left America early last year in command of a small expedition consisting of only five men, the object of which was to spend one or more winters in Greenland for the purpose of scientific observation, and to make an attempt to reach the North Pole across the interior of Greenland. The commander of the expedition was accompanied in this arduous enterprise by his young wife. The winter quarters of the party were fixed at McCormick Bay, whence Lieutenant Peary travelled 1300 miles northwards over the inland ice, which he found to be in a favourable condition for his journey. After making some important discoveries, the explorer returned to the quarters at McCormick's Bay, where, according to previous arrangements, he awaited the arrival of the relief expedition. Lieutenant Peary, his wife, and his five men are all well. Lieutenant Peary's great sledge journey commenced on May 15 last on the true ice cap of Greenland at the head of McCormick's Bay, and at an elevation of four thousand feet. The explorer, who took with him only one man and fourteen dogs to draw the sledge, passed along the edge of the Humboldt Glacier and then across the feeder basins of the St. George's and Osborne Glacier system. On June 26 he reached the 82nd parallel. Here the coast trended to the north-east, and then east, and finally compelled the explorer to pursue a south-easterly course. After four days' march, during which the coast still stretched south-east and east, Lieutenant Peary reached the head of a great bay in latitude 81° 37', and longitude 34°. This was on July 4, and in honour of the day he named this opening Independence Bay. The glacier terminating on its shores he called the Academy Glacier. The land here was of a red-brown colour and free from snow, and flowers, insects, and musk oxen were abundant; while hares, foxes, and ptarmigan were also seen. On July 9 Lieutenant Peary and his companion started on their return journey, taking a more inland course, and in seven days' time they were travelling over soft snow on the interior plateau, at an elevation of 8000 feet.

The explorer then again descended to the coast, covering thirty miles a day. He met the *Kite*, with the relief party, on August 4, near the head of McCormick's Bay, having completed his original programme to the very letter. The geographical discoveries made by the expedition include the tracing of the Greenland coasts above the 79th parallel, the termination of the continental ice-cap below Victoria Inlet, and the existence of glaciers on all the northern fiords. Many valuable tidal and meteorological observations were also obtained, as well as a quantity of material for the ethnological study of the northern Eskimo, including specimens of their costumes, tents, and sledges. The expedition brings home, besides a number of photographs of natives and of Arctic scenery, a large collection of the flora and fauna of the high latitudes visited.

THE four Dundee whaling vessels, whose intended voyage to the Antarctic seas has been already referred to in these notes, sailed from Dundee last week. Three of the vessels carry surgeons who have been specially instructed in making meteorological and biological observations. They are fully equipped with appliances for collecting specimens of every kind. The more strictly geographical conditions will be observed by the captains, who have been supplied with additional instruments to enable them to lay down their track with a greater degree of accuracy than would be necessary in ordinary circumstances. Their long Arctic experience fits them for navigating the ice-hampered waters of the South and for comparing the conditions found there with those of the better-known North Polar zone.

THE railway from Jaffa to Jerusalem is now practically completed, and will be opened for traffic before the end of this month. Recent events in Russia have caused a great increase in the Jewish population of Jerusalem, leading to the extension of the city beyond the walls. The railway will do much to promote the prosperity of Palestine and will probably be largely utilized.

THE Gilbert Islands, in the Central Pacific, have been definitely brought under British protection. The group is bisected by the equator, and forms the central link in the long chain of coral and volcanic islands which stretches from the northern to the southern tropic between the meridians of 160° and 180° E. The Marshall Islands, which are the most northerly of this chain, are under German control.

THE Proceedings of the Royal Geographical Society for September publishes an interesting account of a journey in Sikkim undertaken by Mr. C. White and Mr. Hoffman in July 1891, with the purpose of exploring and photographing the surroundings of Kanchinjanga. The travellers crossed by the Zeumtso La pass into the Tremu Valley, the magnificent glacier in which was visited for the first time by Europeans. The main glacier—fifteen miles long—is joined by the union of six smaller glaciers, and several others were observed which could not be approached. The Tremu Valley was proved to be only a fortnight's journey from Darjiling, a fact which makes the almost entire ignorance of the existence of glaciers in it very remarkable.

IN the course of his travels into the interior of Iceland (*Petermann's Mitteilungen*, vol. 38), Th. Thoroddsen discovered an unknown lake in the unexplored region of Vatna-Jökull. "The greatest part of the western edge of the Vatna-Jökull is formed by a mighty glacier, whose margin stretches with faint curvature towards the southern horizon. The mountain chains which reach the glacier are powerless to influence its shape. We were surprised by the discovery of a very long lake, stretching from the margin of the glacier close to us towards the south-west as far as the eye could see, and filling up the valley between us and a parallel mountain chain. The narrow lake is of a milk-white colour, formed as it is by glacier ice. I named it Langisjor. The glacier reaches with its steep flank to the north end of the lake, and as it is riddled with clefts it is impossible to ride round on this side. The landscape round the lake is of magnificent beauty, only vegetation is quite absent. The greenish-white lake is surrounded by red and yellow tuff hills, with innumerable fantastic points and summits. On the other side of the chain which terminates the lake in the south stretches an extensive flat plateau, in which glitters a large watercourse, probably the Skapta, and far to the south are seen some great lava streams, dating probably from the 1783 eruption."

INTERNATIONAL CONGRESS OF PHYSIOLOGISTS.

THE second International Congress of Physiologists, which took place at Liège on August 29, 30, and 31, was attended by more than 100 physiologists, including among others:—Prof. F. Holmgren (Upsala), President of the Congress, Profs. Hensen, Hürthle, Kühne, Rosenthal, Cybulski, Kronecker, Miescher, Fredericq, Héger, Heymans, Arloing, Chauveau, Dastre, Gréhant, Hédon, Langlois, Laulanié, Morat, Wertheimer, Hamburger, Grigorescu, Wedensky, and the following English members: Profs. Foster, Burdon Sanderson, Schäfer, Allen, Gotch, Halliburton, Horsley, Purser, Waymouth Reid, Stirling, Waller, Drs. Adami, Beevor, Paton, Martin, Mott, Pye-Smith, Sherrington, Starling, Shore, Sims Woodhead; Messrs. Bayliss, Burch, and Parsons.

The work of the Congress was carried on in the Institutes of Zoology and Physiology, these institutions being placed at the disposal of the members by the kind courtesy of the two directing professors, whilst in addition the whole arrangements were excellently organized through the energy of the Professor of Physiology, Prof. Léon Fredericq.

The work of each day was so arranged that the mornings only need be devoted to the formal hearing of communications in the large lecture hall of the Zoological Institute, and the afternoons were thus left entirely free for informal meetings in the Physiological Institute, when demonstrations of special interest were shown in the rooms of the laboratory, thus adding very materially to the interest and utility of the proceedings. The following list of the various communications and demonstrations will at least serve to show the large extent of ground covered by the subject-matter brought forward, and the activity with which physiological research is now being pursued.

MONDAY, AUGUST 29.—PRESIDENTS: PROF. CHAUVEAU (Paris), PROF. BURDON SANDERSON (Oxford).

A. Communications.

1. Hermann.—Phonophotography.
2. Rosenthal.—Results of observations with improved calorimetric methods.
3. Halliburton.—Nucleo-albumins.
4. Starling.—The fate of peptones in the blood and the lymph.
5. Max Cremer.—Experiments on the effects of feeding animals with certain sugars.
6. Langlois.—The functions of the suprarenal bodies.
7. Morat.—The innervation of the tensor tympani.
8. Hamburger.—The effect of different salts upon the properties of red blood corpuscles.
9. Céline Muro.—Physiological evolution.

B. Demonstrations.

1. Hürthle.—A new method of registering the sounds of the heart in man by means of a microphone.
2. Wertheimer.—(a) The excretion by the liver of bile introduced into the blood.
(b) Vaso-dilatation effects of strychnia.
3. Laulanié.—The cardiograph (needle method).
4. Wedensky.—Demonstration by the telephone of the electrical changes which accompany the passage of nerve impulses, and the influence upon these of electrotonic alterations in nerve excitability.
5. Sherrington.—The cortical representation of the movements of the hallux and especially of the anus in the Macaque monkey.
6. Langlois.—The variations in the discharge of heat during "la maladie pyocyannique."

TUESDAY, AUGUST 30.—PRESIDENTS: PROF. KÜHNE (Heidelberg), PROF. HÉGER (Brussels).

A. Communications.

1. Bowditch.—Composite photography.
2. Olivier.—Protoplasmic continuity.
3. Schäfer.—The structure of the insect's wing muscles.
4. Schäfer.—The negative effects of severance of the frontal lobes of the cerebrum.
5. Vitzou.—(a) The visual centres of the dog and monkey.
(b) The effects of total ablation of a cerebral hemisphere.