

charcoal, such as the denser varieties of cellulose, yield it in relatively large quantities. It appears, therefore, to be produced by the action of sulphuric acid upon that portion of the wood charcoal which is least carbonised and retains a larger proportion of hydrogen and oxygen. Now it is well known that pyromellitic acid may be obtained by the action of sulphuric acid upon mellitic acid. M. Verneuil has recently shown, while these experiments of M. Girard were in progress, that when sulphuric acid acts upon wood charcoal a certain amount of mellitic acid is produced. It is therefore practically certain that by the action of sulphuric acid upon wood charcoal, in addition to the production of the gaseous dioxides of sulphur and carbon, mellitic acid is produced which in turn is converted by a further quantity of sulphuric acid into pyromellitic acid, and the latter is deposited in crystals in the cooler portion of the flask in which the reaction occurs.

THE additions to the Zoological Society's Gardens during the past week include two Brown Capuchins (*Cebus fatuellus*, ♂♂) from Guiana, presented respectively by Mr. Charles Gordon Frazer and Miss Florence Marryat; two Four-horned Antelopes (*Tetracerus quadricornis*, ♂♂), from India, presented by Mr. W. F. Sinclair; four common Swans (*Cygnus olor*), British, presented by Lord Braybrooke; two Jameson's Gulls (*Larus nova-hollandia*), from Australia, presented by Sir Ferdinand von Mueller, K.C.M.G.; two Hoary Snakes (*Coronella cana*), a Crossed Snake (*Psammophis crucifer*), an Infernal Snake (*Boodon infernalis*), from South Africa, presented by Mr. J. E. Matcham; two Natterjack Toads (*Bufo calamita*), British, presented by Miss Peckham; three Stock Doves (*Columba anas*), British, presented by Mr. Lionel A. Williams; a yellow-cheeked Amazon (*Chrysolis autumnalis*), from Honduras, two Alligator Terrapins (*Chelydra serpentina*), from North America, deposited; a White-bellied Sea Eagle (*Haliastur leucogaster*), two Wonga-Wonga Pigeons (*Leucosarcia picata*), from Australia, purchased; a Reindeer (*Rangifer tarandus*, ♀), a Japanese Deer (*Cervus sika*, ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

SUN-SPOTS AND WEATHER.—The first part of vol. vi. of "Indian Meteorological Memoirs" (Calcutta, 1894) contains a paper by Mr. W. L. Dallas, Assistant Meteorological Reporter to the Government of India, on the relation between sun-spots and weather, as shown by meteorological observations made on board ships in the Bay of Bengal during the years 1856 to 1879. The region selected offered peculiar advantages for such inquiry. The annual periodic changes in it are small, and the aperiodic changes are very slight. There is also comparatively little horizontal air motion, and, being a sea surface, the area is not liable to the sudden changes which affect a land observatory, and result from irregularities in the elevation of the land surrounding an observatory. The discussion of the pressure observations shows that there are certain points of similarity between barometer readings and the number of spots on the sun. The number of years during which the number of sun-spots exceeded the normal average coincides with the number of years during which the pressure was below the average, and *vice versa*, while the maximum pressure differences, whether above or below the average, occur one year after the maximum sun-spot variations in both directions. The same general agreement is disclosed by the discussion of temperature observations, but here again there is the same want of exact relation. In the case of pressure the curves show that a defect of pressure prevailed during the years in which the relative number of spots was excessive; and an excess of pressure during the time they were at or about their minimum. So in temperature, it appears from Mr. Dallas' investigation, that there exists a general defect when the number of spots is low, and a general excess when the number of spots is high. The indications are, therefore, that years of maxima and minima in a solar cycle are also years of maximum and minimum solar radiation.

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Another paper on sun-spots and weather has also recently been received (*Bulletin de la Société des Amis des Sciences et Arts de Rochechouart*, 1894), the author being Prof. J. P. O'Reilly. By extracts from the annals of Ireland (*Annala Proghacta Eireann*) and those of Ulster (*Annala Uladh*), it is shown that remarkable years of dryness and of cold in Ireland and in Europe are connected with the cycle of solar activity.

EPHEMERIS FOR TEMPEL'S COMET.—The following positions are extracted from the search ephemeris for Tempel's comet, given by M. Schulhof in *Astr. Nach.* No. 3219:—

Ephemeris for Paris Midnight.			
1894.		R.A.	Decl.
June 2	...	1 0 16	S. 0 22'8
4	...	5 58	S. 0 3'9
6	...	11 37	N. 0 14'5
8	...	17 11	0 32'3
10	...	22 41	0 49'6
12	...	28 8	1 6'3
14	...	33 31	1 22'4
16	...	38 49	1 37'9

The comet is not in a good position for observation, but it may possibly be picked up in the east shortly before sunrise.

JUPITER'S SATELLITES IN 1664.—Under this head we reprinted, on February 1, a letter from the New York *Nation* upon a supposed observation of five satellites of Jupiter, made by John Winthrop in 1664. The note led Mr. Frank H. Clutz to determine whether there was any "fixt starre with which Jupiter might at that tyme be in neare conjunction" (*Johns Hopkins University Circular*, May). He finds that the date of observation in our present reckoning was August 16, 1664, and on that date the star B.A.C. 6448 (R.A. 18h. 46m. 55'6s. Decl. -23° 21' 33".04) was at a distance from Jupiter of about 10'.5, which is approximately the distance that the outer satellite may reach. In brightness the star is about the same as the three smaller satellites—between the sixth and seventh magnitudes. Mr. Clutz thinks, therefore, that this star was the object which Winthrop took for a fifth satellite.

ANNIVERSARY MEETING OF THE ROYAL GEOGRAPHICAL SOCIETY.

THE report of the Council of the Royal Geographical Society was presented at the annual meeting on May 28. The total number of Fellows at May 1 was 3775, a net increase of 29 during the year.

The President and Council for the ensuing year were balloted for and elected. The principal changes are the retirement of the honorary secretary, Mr. D. W. Freshfield, and the retirement from the Council by rotation of Mr. Francis Galton, Generals Sir W. D. Jervois, J. T. Walker, and Sir Charles Wilson, and Mr. Delmar Morgan. Mr. Clements R. Markham was re-elected as President, the Hon. G. N. Curzon was added to the list of Vice-Presidents, Sir John Kirk was elected Foreign Secretary, and Major Leonard Darwin to co-operate with Mr. H. Seebohm as Secretary. The following new Councilors were elected:—Dr. Robert Brown, Right Hon. Hugh Childers, General Goodenough, Lord Lamington, Admiral A. H. Markham, Admiral E. H. Seymour, and Colonel J. K. Trotter.

The Society's medals were presented in the absence of their recipients, Captain Bower and M. Reclus; the minor awards, already announced in NATURE, were also given, and a series of educational prizes to students from the training colleges.

The President then delivered his annual address, reverting from the recent custom of dealing with the progress of geography during the year to the earlier practice of devoting special attention to some prominent features of exploration.

The greater part of the address was devoted to the polar expeditions of the present year, the facts regarding which have already appeared in NATURE. Mr. Markham is a high authority on Arctic travel, and his views will carry much weight. He professes a strong preference for large expeditions organised by government, and commanded by naval officers, believing that men combining high scientific attainments, great experience of ice-navigation, and the rare qualities of a leader of men, all of which are necessary for a great polar