sufficient in Western Transcausia, whilst in the eastern parts of the country irrigation would be necessary.

L'Astronomie states in its last number, in reference to a recent note in NATURE, that Admiral Mouchez has drawn up a memorial praying for the removal of the Paris Observatory from its present position, but that he has not yet presented it to the Council of the Observatory, but will do so at an early period. It is not the first time that the idea has been started. The proposal was made in 1868, and a Commission appointed to report on the matter. The scheme was objected to strongly by Leverrier, and finally rejected after a very sharp discussion.

THE Swedish frigate *Vanadis* has just started on a cruise round the world. King Oscar's second son participates in the cruise, as well as Dr. Hjalman Stolpe, who has been commissioned by the Government to collect materials for the nucleus of a National Ethnographical Museum in Stockholm. The frigate, whose mission is chiefly scientific, will call at many places of interest, as, for instance, the Straits of Magellan, the Marquesas and Sandwich Islands, the remarkable Malden Island, &c. A Swedish merchant, M. Fürstenberg of Gothenburg, has contributed 600*l.* for the purchase of objects of scientific value.

M. BOURDALOU, having published in 1864, in his work, "Nivellement Général de la France," that the average level of the Mediterranean is by 0·72 metres lower than that of the Atlantic, this result was received with some distrust by geodesists. General Tillo points out now, in the last issue of the Russian *Izvestia*, that this conclusion is fully supported by the results of the most accurate levellings made in Germany, Austria, Switzerland, and Spain, which have been published this year. It appears from a careful comparison of the mareographs at Santander and Alicante by General Ibanez, that the difference of levels at these two places reaches 0·66 metre, and the differences of level at Marseilles and Amsterdam appear to be 0·80 metre when compared through Alsace and Switzerland ; the *Comptes Rendus de la Commission Permanente de l'Association Géodésique Internationale* arrive at 0·757 metre from the comparison with the Prussian levellings, whilst the fifth volume of the "Nivellements der Trigonometrischen Abtheilung der Landesaufnahme" gives 0·809 *via* Alsace, and 0·832 *via* Switzerland. The difference of levels at Trieste and Amsterdam, measured *via* Silesia and Bavaria, appears to be 0·59 metre. Each of these four results (0·72, 0·66, 0·80, and 0·59), having a probable error of 0·1 metre, their accordance is quite satisfactory, and we may admit thus that the average level of the Mediterranean is in fact lower by 0·7 metre than that of the Atlantic.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus ♂*) from India, presented by Mr. J. L. Waldon ; a Night Heron (*Nycticorax griseus*), European, presented by Mr. N. H. Fenner ; two Barbary Turtle Doves (*Turtur risorius*) from North Africa, presented by Miss Stewart ; four King-hals Snakes (*Sepedon hæmachetes*), a Hoary Snake (*Coronella cana*) from South Africa, presented by the Rev. G. H. R. Fisk, C.M.Z.S. ; a Black-faced Kangaroo (*Macropus melanops ♂*) from Australia, a Broad-nosed Lemur (*Hapalemur simus ♂*) from Madagascar, an Exanthematic Monitor (*Varanus exanthematicus*) from West Africa, purchased.

OUR ASTRONOMICAL COLUMN

THE MASS OF SATURN.—Prof. Asaph Hall has communicated to the Royal Astronomical Society a note upon the mass of Saturn deduced from observations of the outer satellite *Japetus*, made with the 26-inch refractor at the Naval Observatory, Washington, in 1875, 1876, and 1877. The mean distance of the satellite from its primary, reduced to the mean distance of the latter (9·53885), was found to be 515″·522 from 128 observations. For the periodic time of *Japetus* Prof. Hall compared

his own observations with one by Sir W. Herschel on Sept. 20, 1789, and with Sir John Herschel's observations made at the Cape of Good Hope in 1837. The resulting sidereal revolution is 79·3310152 days. Hence the mass of Saturn in units of the sun's mass is $\dfrac{1}{3482\cdot2}$. Bessel, from heliometric measures of the great satellite *Titan* obtained a value of $\dfrac{1}{3501\cdot6}$, which has been since used in nearly all calculations where the mass of this planet enters ; Jacob, from observations of *Titan* made at Madras in 1856–58, inferred a mass of $\dfrac{1}{3487\cdot2}$, which it will be seen closely approaches that given by Prof. Hall. The value deduced by Leverrier from the theory of Uranus is $\dfrac{1}{3529\cdot56}$, and therefore is the smallest of all.

CLOSE DOUBLE-STARS.—M. Perrotin has published in the *Astronomische Nachrichten* further measures of double-stars made at the Observatory of Montgros, Nice, amongst which are some of the close binaries. In July last he thought 72 Ophiuchi (rather a problematical object) might be elongated in the direction 110°, but in the following month it appeared single under good conditions of atmosphere. Of the closer stars we find—

			Position	Distance
η Coronæ Borealis	...	1883·564 ...	156°·00 ...	0″·610
Σ 1938	... ...	——·595 ...	112·95 ...	0·750
ε Equulei	... ...	——·640 ...	285·57 ...	0·973
O.Σ. 395	... ...	——·667 ...	95·30 ...	0·690

PONS' COMET.—The following approximate places of Pons' comet are deduced from the provisionally corrected elements of MM. Schulhof and Bossert :—

At Greenwich Midnight

1883–4	R.A. h. m. s.	Decl. ° ′	Log. distance from Earth	Sun
Dec. 31 ...	21 39 4 ...	+ 23 54·9 ...	9·8263 ...	9·9585
Jan. 2 ...	21 53 26 ...	20 45·2		
4 ...	22 7 37 ...	17 22·8 ...	9·8098 ...	9·9409
6 ...	22 21 31 ...	13 49·5		
8 ...	22 35 3 ...	10 7·5 ...	9·8029 ...	9·9249
10 ...	22 48 9 ...	6 21·0		
12 ...	23 0 44 ...	+ 2 33·2 ...	9·8065 ...	9·9111
14 ...	23 12 45 ...	− 1 12·2		
16 ...	23 24 10 ...	4 52·7 ...	9·8201 ...	9·9002
18 ...	23 34 58 ...	8 24·9		
20 ...	23 45 8 ...	11 47·7 ...	9·8414 ...	9·8928
22 ...	23 54 41 ...	14 59·5		
24 ...	0 3 37 ...	17 59·9 ...	9·8678 ...	9·8894
26 ...	0 11 57 ...	20 48·2		
28 ...	0 19 44 ...	− 23 25·1 ...	9·8966 ...	9·8901

The intensity of light is at a maximum in the middle of January. The comet will be nearest to the earth on January 9, distance 0·634, or rather less than two-thirds of the earth's mean distance from the sun. At its last appearance in 1812 it did not approach the earth within about 1·35.

TEMPEL'S COMET, 1867 II.—M. Raoul Gautier of Geneva is engaged upon a revision of the orbit of this comet, which, it may be remembered, experienced great perturbations from a near approach to the planet Jupiter during the revolution 1867–73. It may probably arrive at perihelion again about May, 1885. If there should still be unpublished observations of this comet, it would be desirable to communicate them at once to M. Gautier, that they may be brought to bear upon his investigation.

DE MORGAN'S FIVE FIGURE LOGARITHMS.—There is a report that the five-figure tables of logarithms of numbers and trigonometrical functions published "under the superintendence of the Society for the Diffusion of Useful Knowledge," but which are usually known as De Morgan's Tables, are out of print, and that there is no present intention of a further issue. If this be the fact, it is much to be regretted : they are by far the most convenient five-figure tables that we possess, on the score of size and legibility, and have been more widely utilised in astronomical calculations. Lalande's Tables, the stereotype edition of Firmin Didot, are good, and the same may be said of Gauss's, where it is of advantage to have two degrees on one opening ; but we nevertheless unhesitatingly give the preference to "De Morgan."