

Wild Dogs (*Canis rutilans*) from Sumatra, a Javan Adjutant (*Leptoptilus javanicus*) from Java, received in exchange; a Wapiti Deer (*Cervus canadensis*), an Axis Deer (*Cervus axis*), born in the Gardens; three Siamese Pheasants (*Euplocamus praelatus*), two Horned Tragopans (*Cerionis satyra*), two Peacock Pheasants (*Polyplectron chinquis*), four Mandarin Ducks (*Aix galericulata*), four Variegated Sheldrakes (*Tudorna variegata*), bred in the Gardens.

### OUR ASTRONOMICAL COLUMN

KEPLER'S NOVA OF 1604.—The vicinity of this object is now favourably situate for observation in the evenings, and it is well worth while to keep a close watch upon one or two small stars near the position deduced for Kepler's object by Prof. Schönfeld from the observations of David Fabricius, which he considered preferable to those of Kepler and his pupils, given in his celebrated work, "De Stella nova in pede Serpentarii," more especially upon a star of the twelfth magnitude, or fainter, observed by Prof. Winnecke in 1875, which is close upon the place of a star of the tenth magnitude inserted on Chacornac's chart, but not afterwards found of this degree of brightness, and which is still more significant, almost exactly in the position of Kepler's object assigned by the observations of Fabricius. The most convenient reference-star in this neighbourhood is one meridionally observed by Argelander, No. 16872 of Oeltzen's Catalogue, a bright ninth magnitude, the position of which for the beginning of the present year is in R.A. 17h. 23m. 52<sup>s</sup>.2s., N.P.D. 111° 23' 22"; Schönfeld's place of Nova 1604 for the same epoch is in R.A. 17h. 23m. 26<sup>s</sup>.9s., N.P.D. 111° 22' 32"; Winnecke's star precedes Argelander's 33<sup>s</sup>.2s., in 2<sup>h</sup> 7 less N.P.D. There is a somewhat brighter star preceding Argelander's 18<sup>s</sup>.8s, with 1<sup>h</sup> 6 greater N.P.D., which, after several years' observation, has not exhibited any sensible fluctuation of magnitude. Attention should be chiefly directed to Winnecke's object, and it would be desirable to know its present magnitude, which some reader of this column may have the opportunity of putting upon record; we would, however, suggest its frequent observation.

There is no reason to suppose, notwithstanding the name of "temporary stars" which has been attached to them, that either Tycho Brahe's famous star of 1572, Kepler's of 1604, or the less conspicuous star discovered by Anhelm in 1670, have died out; on the contrary, in all three cases there are now small stars close upon the best positions which we can assign to the objects of those years, in which some fluctuations of brightness have been remarked after very careful observation.

WESTPHAL'S COMET (1852 IV).—In Mr. Chamber's useful manual of astronomy there is an oversight with respect to the orbit of the comet discovered by Westphal at Göttingen in June, 1852, the elliptic character of which was first made apparent by the computations of Mr. Marth towards the end of the same year. Elements derived from the earlier calculations are given in place of the definitive orbit deduced by Dr. Axel-Möller or the similar very completely-investigated orbit by the discoverer; hence the comet is credited with a period of revolution which is certainly ten years in excess of that belonging to the ellipse in which it was moving during its appearance in 1852. Dr. Axel-Möller's orbit is as follows:—

Perihelion passage, 1852, October 12<sup>h</sup> 76278 G.M.T.

Longitude of perihelion ... ..	43 14 8	Mean equinox,
"    ascending node ... ..	346 9 49	1852 <sup>o</sup>
Inclination ... ..	40 54 28	
Angle of excentricity ... ..	66 42 8.36	
Log. semi-axis major ... ..	1 <sup>h</sup> 1855845	
	Motion—direct.	

With these elements we find:—

Semi-axis major ... ..	15 <sup>h</sup> 3315
"    minor ... ..	6 <sup>h</sup> 0637
Excentricity ... ..	0.9184625
Aphelion distance ... ..	29 <sup>h</sup> 4129
Perihelion distance ... ..	1 <sup>h</sup> 2501
Revolution ... ..	60 <sup>h</sup> 031 years

It is easy to see by what action the comet has been at some past time in all probability fixed in this orbit till similar perturbation recurs. In a true anomaly of 126° 30' after perihelion or in ecliptical longitude 168° 52', the comet is distant

from the orbit of Jupiter only 0<sup>h</sup> 36 of the earth's mean distance from the sun, and so close an approach of the two bodies would almost certainly result in the impression upon the comet of an orbit, materially differing from that in which it moved previously; this we know has occurred in several instances since the motions of comets have been rigorously investigated, a notable case being that of Brorsen's comet, which is now moving in an orbit into which it was thrown by its encounter with Jupiter in May, 1842.

### GEOGRAPHICAL NOTES

IN yesterday's *Times* is a letter from Mr. Thorndike Rice, giving details of the programme of the expedition to Central America, under the leadership of M. Charnay, for the exploration of the ancient monuments there, and to which we referred some time ago. Casts will be taken of all important bas-reliefs and inscriptions, part of which will be deposited in the Smithsonian Institution, and part sent to Paris. Details of the work of the expedition will be published from time to time in the *North American Review*.

CONSIDERABLE attention is still attracted in Australia to the supposed existence in recent years of a survivor of Leichhardt's great exploring expedition, which disappeared in 1848. Numerous lengthy communications have been published by the Colonial press, which tend to confirm the belief that an aged European, not improbably Classen, as we have before mentioned, was living with the blacks near the Queensland border until some four years ago. A man has also come forward at Sydney and made a curious statement to the effect that he was a sailor on board a steamer which was sent by the South Australian Government in 1867 to take cargo to the Roper River, Gulf of Carpentaria, and that on landing some ten miles to the south of the mouth of that river he met natives who told him that three days journey up the river there was an old white man with a very long beard. The position mentioned would, it is thought, be very near the Elsey, where it has been before suggested that something might be found out about the fate of Leichhardt's party. It is to be regretted that the different persons who have contributed items of information did not come forward sooner with their contributions, however small, towards the solution of this mystery, as it might have been cleared up ere this.

THE s.s. *Eira*, recently launched, left Peterhead on Saturday morning for the Arctic regions on a voyage of discovery. She has a crew of some twenty-five, and carries a photographer, the same who accompanied Capt. Nares, and a doctor. The steamer has been coaled and provisioned for two years, but her return is expected before that time.

THE Ontario correspondent of the *Colonies and India* states that the construction of the long-talked-of railway across the island of Newfoundland has at length been decided upon; it will be 350 miles long, and will be of great benefit to the island.

IN his report on the department of maps, charts, &c., at the British Museum, Mr. Major notes the undermentioned interesting additions during the past year:—A large English chart on parchment of the coasts of Brazil and Africa of the early date of 1647, bearing the legend, "made by Nicholas Comberford, dwelling near to the West end of the Schoole House, at the XX signe of the Plat in Radcliffe, anno 1647." Also two illuminated and gilt MS. maps on parchment, the one of the coasts of Florida, New Spain, and Africa (1688), and the other of the West Indies (1698). These are by Jose da Costa Miranda. Another valuable acquisition is an important plan of Paris in seventy-two sheets, constructed by Varnique, and finished in 1791, after thirty years' labour.

THE new number of the Belgian Geographical Society's *Bulletin* opens with a paper on the geography of Lake Tanganyika, which was prepared by Lieut. Col. Adan for the committee of the International African Association; it is illustrated by an interesting reproduction on one sheet of various maps, exhibiting the views of cartographers on the shape of the lake. The other papers are by Dr. Litton Forbes on the Island of Rotumah, and by M. A. J. Wauters on the African elephant.

### SIR JOHN LUBBOCK ON THE HABITS OF ANTS

IN a further contribution of his observations towards elucidating the economy and habits of these insects, laid before the last meeting of the Linnean Society (June 17), Sir John commenced