

the machinery and elements is a little less than 250 kilogrammes. The real effect on the air can only be found by experiments in the air, but according to measurements taken with a dynamometer of the horizontal tendency to motion, it is about the same as in the experiment tried by Dupuy de Lome. The motive power of Dupuy de Lome having been obtained with eight men working his large screw, whose diameter was 9 metres, it may be inferred that the results in the present case will be more advantageous in the ratio of *two and a half to one*. These results are not very powerful when compared with the immense power of aerial currents. But MM. Tissandier have no intention of directing their balloon against strong winds. Their object is to organise an apparatus with which rational experiments may be made in the air, and they have taken advantage of the most recent improvements of science. If their elongated balloon answer their wishes, a real advance will be registered in the history of aeronautics.

EXCAVATIONS are being carried out on Blackheath for the purpose of exposing the "deneholes" which have puzzled geologists and archaeologists, and of which we gave some account in vol. xxiii. p. 365.

In 1884 a general Italian exhibition will be opened at Turin. Among the exhibits will be works in mathematics, physics, and general chemistry.

THE "Treatise on Marine Surveying," reviewed in last week's NATURE, is published by Messrs. Macmillan and Co., and not by Mr. Murray.

THE additions to the Zoological Society's Gardens during the past week include a Mona Monkey (*Cercopithecus mona* ♀) from West Africa, presented by Mr. J. N. Flatau; a Crested Porcupine (*Hystrix cristatus*) from West Africa, presented by Mr. Joseph J. Dove; two Pileated Jays (*Cyanocorax pileatus*) from La Plata, presented by Capt. Gamble; two Grey-breasted Parrakeets (*Bolborhynchus monachus*) from the Argentine Republic, presented by Mr. Tomas Peacock; an European Tree Frog (*Hyla arborea*), European, presented by Mrs. M. B. Manuel; a Malbrouck Monkey (*Cercopithecus cynosurus* ♂) from East Africa, a Macaque Monkey (*Macacus cynomolgus* ♀) from India, deposited; a Water Chevrotain (*Hyomoschus aquaticus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

VARIABLE STARS.—The following are Greenwich times of heliocentric minima of Algol:—

	h. m.		h. m.
February 3,	8 47	Feb. 26,	7 18
17,	16 52	March 12,	15 23
20,	13 41	15,	12 12
23,	10 29	18,	9 1

The light equation (geocentric—heliocentric) in seconds, may be found from the expression—

$$460.2s. R. \sin (S + 35^{\circ} 28' 7),$$

where R is the earth's radius-vector, and S the longitude of the sun. S Cancri will be at a minimum about the following times:—February 2, at 9h. 40m.; February 21, at 8h. 55m.; and March 12, at 8h. 2m. A minimum of U Cephei occurs on February 5, about 13h. 26m. χ Cygni is at minimum on March 17. This year's maximum of Mira Ceti is not observable. According to the observations of Mr. Knott in 1881 and 1882, a maximum of T Cephei, when the star is about 6.5m., may be expected towards February 17; the position of this variable for 1880 is in R.A. 21h. 7m. 57s, Decl. +68° 0' 1; it is No. 3731 in Fe Lorenko's catalogue from Lalande.

REPORTED DISCOVERY OF A COMET.—A Reuter's telegram from Puebla, Mexico, January 23, states that a comet had been discovered there near the planet Jupiter, of which no further account has been received at the time we write, nor has a some-

what hurried examination of the vicinity between clouds revealed anything brighter or more cometary in aspect than our very old friend, the first nebula of Messier's catalogue near ζ Tauri, which has proved "a mare's nest" for more than one incipient comet-hunter. Jupiter was close at hand on January 22, but there was a full moon on that date, which hardly favours the suggested explanation. Messier 1, it may be remembered, led to more than a single false alarm when observers were on the look out for Halley's comet in 1835.

THE NEXT RETURN OF D'ARREST'S COMET.—At the sitting of the Paris Academy of Sciences on January 22, M. Leveau communicated elements of the orbit of D'Arrest's comet of short period, for the approaching return to perihelion. He states that on account of the great perturbations suffered by the comet from its passage near Jupiter during the period 1859-1863 (in April, 1861, it passed within 0.36 of the earth's mean distance from the planet), and the want of observations at its third appearance in 1864, it has not been possible to combine in the same system of elements the observations made in 1851 and 1857 with those of 1870 and 1877. He has consequently been obliged to determine the osculating orbit in 1883, from the elements which best represent the observations of 1870 and 1877 alone. The following are the elements of the comet's orbit for 1883, June 12^o, M.T. at Paris:—

Mean anomaly	328 13 20.3	
Longitude of perihelion	319 11 10.8	} Mean
Longitude of ascending node	146 7 21.0	
Inclination	15 41 47.1	} 1880 ^o
Angle of eccentricity	38 46 33.4	
Mean daily sidereal motion	530' 65.245	

It is M. Leveau's intention to prepare and circulate among astronomers an ephemeris for what appears to be the most likely period during which to obtain observations, or from April 23 to November 25 in the present year, but from the comet's great distance or unfavourable position it is probable that only the largest telescopes will command it. By the above elements the comet will not arrive at perihelion until 1884, January 13^h 57^m 65^s Greenwich M.T.

MERIDIAN OBSERVATIONS OF NEBULÆ.—Dr. Engelmann publishes the positions of about 120 nebulae, determined with the 6-inch meridian circle of the Leipsic Observatory, and reduced to the beginning of the year 1870, with the mean epoch of observation and the annual precessions, thus aiding by meridian observations the extension of our knowledge of accurate places of these bodies, which has engaged the attention of d'Arrest, Vogel, Schönfeld, Schultz, and others, with equatorial instruments. Valuable material is thus being collected for the investigation of proper motion amongst the nebulae, which for want of reliable positions in past times, is not practicable at present, except perhaps in a few isolated cases.

ERRATUM.—In last week's "Astronomical Column," p. 300, lines seven and six from bottom, for *Washington* read *Washburn*.

PHYSICAL NOTES

A DOUBLE-ACTION mercury air-pump, invented by Signor Serravalle, who was awarded a gold medal for it at a recent exhibition in Messina, is described in the *Rivista Scientifico-Industriale* (Nos. 21-22). By a simple mechanical method two similar vessels are raised and lowered alternately with each other on opposite sides of a vertical support. A long caoutchouc tube connecting their bottoms lets mercury pass from one to the other. Each has at top a three-way cock; one part of which in a certain position leads into a small open vessel to receive any excess of mercury, and another is connected by means of a caoutchouc tube with a spherical piece fixed laterally about the middle of the vertical support. This piece has three passages, communicating together; two of them are opposite each other, and lead into the tubes from the mercury vessels; the other is connected by tubing to the vessel to be exhausted of air. The three-way cocks at the tops of the vessels are mechanically shifted at the top and bottom of their course by means of a toothed sector and rack in the one case, and a pin and projecting piece in the other.

To observe directly the action of gravity on gases, M. Kraievitch, of the Russian Chemical Society (*Four. de Phys.*,