ment with 4·1 grams of a 52 per cent. solution of hydroxylamine, 10 grams of methyl iodide (the molecular proportion), and a smaller quantity of methyl alcohol, mixed together in a flask fitted with an upright condenser, the energy of the reaction was found to be sufficiently great to heat the liquid to the point of ebullition, and crystals soon commenced to deposit. Ethyl iodide reacted in a precisely similar manner. The crystals, after draining and washing with a mixture of alcohol and ether, proved to be those of the pure hydriodides of the β-alkyl hydroxylamines. Their aqueous solutions acidulated with nitric acid do not reduce silver nitrate, so that their analysis is easily effected. In this respect they differ from nitric acid solutions of hydroxylamine, which of course at once reduce silver nitrate. They reduce Fehling's solution, however, instantly at the ordinary temperature. It would appear from this mode of preparation that the action of alkyl iodides on hydroxylamine is similar to their action upon ammonia. The salts are perfectly stable up to beyond 200° C. M. de Bruyn shows finally that it is not essential to have at command such concentrated solutions of hydroxylamine as those obtained during the preparation of the solid base. The weak aqueous or alcoholic solutions obtained in the usual manner from hydroxylamine hydrochloride, may equally well be employed; it is only necessary to decompose the solution of the hydrochloride in tepid water with potash, add an equal bulk of methyl alcohol, filter from the precipitated potassium chloride, and at once proceed to agitate with methyl iodide. The only further point of difference is that the liquid should be finally boiled in the flask fitted with upright condenser in order to complete the reaction.

THE additions to the Zoological Society's Gardens during the past week include a Black-eared Marmoset (*Hapale penicillata*) from South-east Brazil, presented by Mr. H. M. Dodington; a Common Peafowl (*Pavo cristatus*) from India, presented by Mrs. Tannenbaum; a Monteiro's Galago (*Galago monteiri*) from West Africa, two Pinche Monkeys (*Midas œdipus*) from New Granada, deposited; a Maholi Galago (*Galago maholi*), two Japanese Deer (*Cervus sika*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

RECENT OBSERVATIONS OF JUPITER'S SATELLITES.—In the May number of *Astronomy and Astro-Physics*, Dr. E. S. Holden calls attention to some important points in connection with Prof. Barnard's observations of Jupiter's satellites, recently published in that journal and in the *Monthly Notices*. In the first place, the results announced by Prof. W. H. Pickering in 1893 (see NATURE, vol. xlvii. p. 519), with regard to the forms and rotations of these bodies, are not confirmed by Prof. Barnard's observations. Next, Prof. Barnard has found that all the Jovian satellites are spherical, whereas Profs. Schaeberle and Campbell announced in 1891 that Satellite I. was ellipsoidal, with its longest axis directed towards the centre of Jupiter. It was also concluded by these observers that the periods of rotation and revolution of the first satellite were equal; but Prof. Barnard says that his observations lead to a different result. Another point upon which Prof. Barnard's recent observations have thrown light, is the appearance of the first satellite when projected upon Jupiter. It will be remembered that the satellite was seen in transit as a double body in 1890, but Prof. Barnard has shown that the apparent duplicity was due to simple contrasts between bright regions on the planet and two extensive dusky polar caps on the satellite (see NATURE, vol. xlix. p. 300). Other strange appearances of satellites during transit can be explained in a similar manner. Prof. W. H. Pickering has criticised the statement that the assumed belt on the first satellite is a permanent one (*Astr. Nach.* 3229), and says that it certainly did not exist at the time of the opposition of 1892, during the period covered by the Arequipa observations. He points out that, upon his meteoric hypothesis, it is not unlikely that belts should form and then disappear. It is a fairly common belief among astronomers that the satellites of Jupiter can be seen through the planet's limb during occultation. On this point, Prof. Barnard says: "In my mind this [the observation of the transparency of Jupiter's limb] has been due to poor seeing, a poor telescope, or an excited observer. For nearly fifteen years I have observed Jupiter and his satellites, and with telescopes all the way from five inches up to thirty-six inches have tried to see this phenomenon. I have often watched the satellites under first-class seeing with the 12-inch here Mount Hamilton] at occultation, but have never seen one of them through the limb of Jupiter, though that phenomenon was specially looked for." It will be seen from these points that Jupiter and his satellites still offer a wide field for investigation.

THE MASS OF THE ASTEROIDS.—Mr. B. M. Roszel contributes to the Johns Hopkins *University Circular* for April a preliminary note on the probable mass of the asteroids. He has investigated the secular perturbations to which a ring of matter, such as the asteroids form round the sun, would give rise. The problem divides itself naturally into two parts—(1) to determine the combined mass of the asteroid belt; and (2) knowing the mass, to derive the secular perturbations of the elements of the orbits of certain of the major planets caused by this elliptic ring of matter. If the total number of the asteroids were known, it would only be necessary to determine the most probable mass of one member of the group to derive the combined mass of the whole group. But this is not the case, so Mr. Roszel has contented himself with determining the mass from a study of two hundred and sixteen of the minor planets at present known. The magnitudes of these bodies vary from magnitudes 6 to 15·5, the greater number lying between magnitudes 11 and 12. From photometric observations, Prof. Pickering derived for Vesta a diameter of 319 ± 10 miles. (Prof. Barnard's recent observations only assign the planet a diameter of 237 ± 15 miles). Now the ratio of the total quantities of light reflected by two planets at the same distance from the observer is equal to the ratio of the squares of their diameters. Utilising this fact, Mr. Roszel has been able to determine the volumes of the two hundred and sixteen asteroids referred to in terms of the volume of Vesta. Assuming Pickering's dimensions of Vesta to be correct, it appears that it would take roughly three hundred and ten asteroids of the sixth magnitude, or twelve hundred of the seventh, to equal our moon in volume. And in round numbers the combined volume of a ring of two hundred and sixteen would be only one two-hundredth part of that of our satellite. Assuming a mean density equal to that of Mars, the mass of the zone of asteroids comes out as about one one-hundred and seventieth part of the mass of the moon. From these considerations Mr. Roszel thinks that the probable mass of the entire asteroid belt is somewhere between one-fiftieth and one one-hundredth part of that of our moon.

EPHEMERIS OF GALE'S COMET.—The following ephemeris (for Berlin midnight) is abstracted from one given by Prof. Kreutz in *Astronomische Nachrichten*, Nos. 3227 and 3229:—

	R.A. h. m. s.	Decl. ° ′	Brightness.
May 26	10 44 37	N. 36 11·3	0·80
30	10 57 40	38 10·9	0·60
June 3	11 9 14	39 39·3	0·40
7	11 19 38	40 45·6	0·33
11	11 29 12	41 35·6	0·26
15	11 38 7	42 13·1	0·21
19	11 46 31	42 41·0	0·17
23	11 54 53	43 1·4	0·14

The brightness on April 3 has been taken as unity.

The comet was photographed by the Brothers Henry, at Paris Observatory, on May 5. The photograph was obtained with an exposure of forty minutes, and showed a tail, about four degrees in length, divided, at a short distance from the head, into two branches separated by an angle of about three degrees. The mean direction of the two parts of the tail was very nearly perpendicular to the direction of the comet's motion.

SOME LONDON POLYTECHNIC INSTITUTES.

IT is only in recent years that any attempt has been made to supply the demand for technical education in London. Not so very long ago the question as to whether such education was desirable for the working classes was gravely