THE barium salt of a new acid-forming oxide of cobalt, CoO_2, corresponding to the black dioxide of manganese, MnO_2, has been obtained by M. Rousseau, and is described in the current number of the *Comptes rendus*. It forms large black prismatic crystals, and appears to be a very definite compound of the composition $BaO . CoO_2$, and possessing some stability. The most favourable method of preparing it is as follows. A mixture of 15 grams of crystals of barium chloride or bromide with 5 or 6 grams of finely-powdered anhydrous barium oxide is heated gradually to redness in a platinum crucible. The temperature is then raised in a good furnace to 1000°-1100° C., when 1 gram of sesquioxide of cobalt, Co_2O_3, is introduced by degrees into the fused mass, and the temperature maintained for about five hours. At the expiration of this time a ring of large black prisms, exhibiting beautiful iris-coloured reflections, is formed. The crystals are found to contain a little platinate of barium, owing to the platinum crucible being attacked at the high temperature, but after elimination of this impurity the analyses agree very closely with the formula $BaO . CoO_2$. The crystals of this monocobaltite of barium are soluble in cold concentrated hydrochloric acid with evolution of heat, and dissolve likewise in nitric acid with effervescence. At a higher temperature than 1100° they are decomposed with evolution of oxygen gas, the CoO_2 becoming reduced to a lower oxide, probably Co_3O_4, the usual product of the ignition of cobalt oxides. Hence the necessity for keeping the temperature below 1100° during the preparation. If the fusion be simply performed over the Bunsen lamp, another cobaltite is obtained containing two molecules of CoO_2. A crust of crystals of this second compound, $BaO . 2CoO_2$, is formed over the surface of the melt, consisting of brilliant black hexagonal lamellæ. These crystals are likewise soluble in hydrochloric acid with evolution of chlorine gas. In order to avoid the formation of this di-cobaltite it is necessary to maintain the temperature over 1000°, when the neutral monocobaltite is alone produced. Hence the limits of temperature during which the monocobaltite is produced are 1000°-1100°. Thus cobalt resembles manganese in forming a dioxide, capable of liberating chlorine from hydrochloric acid and combining with basic oxides to form cobaltites analogous to the manganites. But this dioxide of cobalt appears from its reactions to be somewhat weaker in its combinations than manganese dioxide, and to form them with greater difficulty, the barium cobaltites above described being as yet the only ones prepared.

THE additions to the Zoological Society's Gardens during the past week include two Crested Porcupines (*Hystrix cristata*), a Desert Buzzard (*Buteo desertorum*), two Natal Francolines (*Francolinus natalensis* ♂ ♀) from South Africa, presented by Captain Henry F. Hoste, R.M.S. *Trojan*; a Common Wolf (*Canis lupus*, juv.) from Provincia de Leon, Spain, presented by Mr. W. S. Lart; four Violaceous Night Herons (*Nycticorax violaceus*), a Green Bittern (*Butorides virescens*), a Dominican Kestrel (*Tinnunculus dominicensis*), a —— Pigeon (*Columba*, sp. inc.) from St. Kitt's, W.I., presented by Dr. A. P. Boon, C.M.Z.S.; two Ocellated Mantis (*Harpax ocellata*) from South Africa, presented by Colonel J. H. Bowker, F.Z.S.; a Wapiti Deer (*Cervus canadensis* ♀), a Peacock Pheasant (*Polyplectron chinquis*), eight Mandarin Ducks (*Æx galericulata*), five Summer Ducks (*Æx sponsa*), two Chiloe Wigeon (*Mareca chiloensis*), six Chilian Pintails (*Dafila spinicauda*), three Australian Wild Ducks (*Anas superciliosa*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE BINARY γ CORONÆ BOREALIS.—Prof. Celoria has recently determined (*Astr. Nach.*, 2904) a new orbit for this difficult binary (Σ 1967), which appears a decided advance upon that of Dr. Doberck's, published twelve years ago. A considerable uncertainty still attaches, however, to the elements, although the star has now been under observation for sixty-three years, and has been watched through nearly three-fourths of a revolution. This is due partly to the circumstance that the orbit is presented to us nearly in profile, and partly to the closeness of the two components. The measures in both elements, therefore, have been difficult to make, and have often been very discordant. Thus some recent position-angles by Engelmann show a systematic difference of 30° or more as compared with measures made at about the same epoch by Schiaparelli and Perrotin. The companion passed its primary on the north side about 1836, reappearing in 1840 on the preceding side. It re-passed the principal star on the south about 1878, and is now again on the following side. Celoria's new elements compare with Doberck's as follows:—

	Doberck.		Celoria.
T	= 1843·70	...	1840·508
Ω	= 110° 24′	...	113°·47
λ	= 233° 30	...	250·68
γ	= 85° 12′	...	81·66
e	= 0·350	...	0·34827
a	= 0″·70	...	0″·63103
P	= 95·50 years.	...	85·276 years.

ECLIPSES AND TRANSITS IN FUTURE YEARS.—The Rev. S. J. Johnson, author of "Eclipses Past and Future," and well known as a calculator of eclipses, presented a large manuscript volume to the Royal Astronomical Society a few months ago containing projections and diagrams of eclipses from the year A.D. 538 to the year 2500. He has now published in a little pamphlet the dates of all the eclipses, both of sun and moon, visible in England from 1700 to 2000, with the solar eclipses for the two following centuries, and the larger solar eclipses up to 2500. The transits of Mercury and Venus are also included, of Venus up to 2500, and of Mercury to 2000.

The twentieth century is distinguished by three years in each of which seven eclipses take place. Of these, Mr. Johnson notices two, 1917 and 1935, the latter being particularly noteworthy as showing five solar eclipses, but does not mention the third case, 1985, though calling attention to the rare occurrence of three total eclipses of the moon which fall that year.

The little pamphlet, which is intended as a kind of supplement to the author's larger work, "Eclipses Past and Future," is illustrated by four pages of diagrams showing the greatest phases of the eclipses up to 1949, as seen from London. The diagrams are nowhere explained, and no indication is supplied as to which are solar and which lunar eclipses. It appears that circles on which the eclipsed portion is shown by deep shading, and which are surrounded by a ring of shade, stand for solar eclipses, the plain circles for lunar eclipses.

THE WHITE SPOT ON SATURN'S RING.—M. Terby, who still strongly contends for the reality of the bright white spot next the shadow of the planet on Saturn's ring, quotes, in the *Astronomische Nachrichten*, No. 2910, an observation of Ceraski's made in 1884, as showing that it is not a mere effect of contrast with the shadow. M. Ceraski, on November 1, 1884, noticed a bright white spot on the ring where it touched the planet in a similar position to M. Terby's spot, but the shadow of the planet fell at that time on the other portion of the ring, so that the spot could not be accounted for by contrast.

COMET 1889 *c* (BARNARD, JUNE 23).—The following ephemeris for this object is by Dr. R. Spitaler (*Astr. Nach.* No. 2909):—

For Berlin Midnight.

1889.	R.A. h. m. s.	Decl. ° ′	Log Δ.	Brightness.
July 27	3 51 1	49 27·4 N.	0·1341	0·55
31	4 6 14	49 47·6	0·1416	0·50
Aug. 4	4 20 35	50 0·3	0·1486	0·46
8	4 34 0	50 7·0	0·1549	0·43
12	4 46 29	50 8·5	0·1606	0·40
16	4 58 1	50 6·0	0·1656	0·37
20	5 8 37	50 0·5 N.	0·1699	0·34

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 JULY 28—AUGUST 3.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)