

the low temperature in a cyclone at a mountain station is due to the lagging behind of the minimum pressure, and similarly with respect to the high temperature in an anticyclone.

AN interesting paper is contributed to the April number of the Journal of the Chemical Society by Mr. Ward Couldridge on chlorophosphide of nitrogen. This peculiar compound was shown some years ago by Dr. Gladstone to be represented by the empirical formula  $\text{PNCl}_2$ , but vapour-density determinations revealed the curious fact that in the gaseous state its molecule really possesses the constitution  $\text{P}_3\text{N}_3\text{Cl}_6$ . Mr. Couldridge prepares it by a method somewhat different from that employed by Dr. Gladstone, and one which gives a better yield. Pentachloride of phosphorus is heated with chloride of ammonium in a flask connected with an upright condenser, so that the pentachloride volatilized returns to the seat of action until it becomes completely decomposed, and the chlorophosphide, which would otherwise be carried away by the escaping hydrochloric acid, crystallizes in the condenser. The whole of the chlorophosphide is subsequently purified by distillation in steam. The reaction is found to be as follows:  $3\text{PCl}_5 + 3\text{NH}_3 = \text{P}_3\text{N}_3\text{Cl}_6 + 9\text{HCl}$ . Chlorophosphide of nitrogen thus prepared dissolves readily in ether, chloroform, or carbon bisulphide, and separates on evaporation in fine rhombic crystals, which have a most remarkable aversion to water, refusing under any circumstances to be wetted by it. When fused and heated above its boiling-point, it emits a singular odour. It has the proud distinction of being unattacked by all the strong acids, hot fuming nitric alone being capable of making any impression upon it. Mr. Couldridge finds that when dry ammonia gas is led through a hot tube containing the melted chlorophosphide, a somewhat violent reaction occurs resulting in the formation of another remarkable compound known as phospham,  $\text{P}_3\text{H}_3\text{N}_6$  or  $\text{P}_3\text{N}_3(\text{NH}_3)_3$ . Not only does ammonia behave in this way, but all substituted ammonias, such as the amines, form similar compounds; aniline, for instance, gives a white solid, readily crystallizable from glacial acetic acid, of the composition  $\text{P}_3\text{N}_3(\text{NH} \cdot \text{C}_6\text{H}_5)_6$ . Phospham itself is both insoluble in water and infusible at a red heat, but fumes in contact with air, owing to slow decomposition and oxidation. One cannot help remarking how singular it is that the introduction of phosphorus, itself a notable combustible, into the terribly explosive compound of chlorine and nitrogen, should result in the formation of a substance so extremely inert as the chlorophosphide; yet such are the vagaries met with by the chemist.

A SECOND edition of Prof. C. M. Tidy's "Hand-book of Modern Chemistry, Inorganic and Organic," for the use of students, has been issued by Messrs. Smith and Elder. As regards general arrangement, the author has adhered to the plan he first adopted. He especially notes that in writing of chemical compounds he has at times not hesitated to use common language. "If," he says, "I have used the word 'potash,' and the body I mean to imply thereby is understood, I am satisfied. I confess that the growing necessity for having a translation at one's side in attempting to understand the modern scientific paper, is in my opinion a circumstance to be deplored. Danger, moreover, is always to be apprehended when a language has to be invented to support a theory or a formula. A party shibboleth has, no doubt, a charm for its special clique. It serves as a bond of union for the initiated, whilst it prevents the interference of outsiders. But, all the same, it is distracting to the independent worker, and can but prove a hindrance to the general cultivation of science."

MESSRS. G. BELL AND SONS will shortly publish "The Building of the British Islands," a study in geographical evolution, by Mr. A. J. Jukes-Browne. The author tries to restore the geography of the British region at successive epochs of geological time, and to describe the gradual formation or evolution of the British Isles. The book will be illustrated by maps.

MESSRS. ROPER AND DROWLEY will publish immediately "Geology for All," by Mr. J. Logan Lobley, Professor of Physiography at the City of London College, and author of several volumes on geological subjects.

THE valedictory address delivered by Mr. J. W. Taylor as President of the Conchological Society has been reprinted from the *Journal of Conchology*, and issued separately. Mr. Taylor brings together some interesting observations bearing on the variation of British land and fresh-water Mollusca.

MR. THOMAS WILSON, of the Smithsonian Institution, calls attention in the *American Naturalist* to the fact that the importance of the subject of criminal anthropology has not hitherto been so thoroughly appreciated in the United States as in Europe. A step in the right direction, however, has been taken by the New York Academy of Anthropology, which lately held a meeting for the consideration of questions connected with criminal anthropology. These questions were classed under two heads, criminal biology and criminal sociology. In the circular summoning the meeting it was contended that the true way of studying crime is to begin with the study of the criminal himself. "It is impossible," said the writer, "to evolve the criminal out of one's inner consciousness. Knowledge of his peculiarities is essential to any rational treatment of him, and this knowledge can only be gained by systematic, intelligent observation of his physical and mental habits, supplemented by an exhaustive analytical comparison of the facts observed, with a view to their right classification and interpretation."

THE Mitchell Library, Glasgow, has now been ten years in existence, and the Committee, in the Annual Report just issued, express the belief that no consulting or reference library has ever made so much progress in so short a time. Speaking of the character of the reading, they say that it continues satisfactory, and bears evidence of a desire on the part of readers to seek solid information from the abundant resources at their disposal. Unfortunately, the Committee have to report that during 1887 twenty-one books were stolen.

THE Royal Microscopical Society will hold a *conversazione* on Wednesday evening, the 25th inst.

AN Aëronautical Exhibition was opened at the Rotunde in the Prater at Vienna on April 1.

THE additions to the Zoological Society's Gardens during the past week include an Arabian Baboon (*Cynocephalus hamadryas* ♀) from Massowah, presented by Mr. D. Wilson-Barker, R.N.R., F.Z.S.; two White-necked Crows (*Corvus scapularis*), two Spotted Eagle-Owls (*Bubo capensis*) from South Africa, presented by Captain Henry F. Hoste, s.s. *Trojan*; a Muscovy Duck (*Cairina moschata*) from South Africa, presented by Mr. W. Shuter; four Half-collared Doves (*Turtur semitorquatus*) from Africa, presented by Mrs. Wisely; a Slowworm (*Anguis fragilis*), British, presented by Mr. F. W. Pilkington; two Indian Swine (*Sus cristatus* ♂♂) from India, a Greater Vasa Parrot (*Coracopsis vasa*) from Madagascar, a Blue-eyed Cockatoo (*Cacatua ophthalmica*) from South Australia, a Goffin's Cockatoo (*Cacatua goffini*) from Queensland, an Asp Viper (*Vipera aspis*) from Italy, deposited; four European Pond Tortoises (*Emys europæa*), European, purchased; two Collared Fruit Bat (*Cynonycteris collaris*), born in the Gardens.

#### OUR ASTRONOMICAL COLUMN.

HARVARD COLLEGE OBSERVATORY.—The most interesting item in the forty-second Annual Report of the Director of the Harvard College Observatory is the account of the threefold accession to its resources which it has received during the past

year. This consisted of the funds provided by Mrs. Henry Draper for carrying on the photographic study of stellar spectra as a memorial to her late husband; the fund left by the late Uriah A. Boyden for the establishment of a mountain Observatory; and the large bequest of the late Robert Treat Paine. Prof. Pickering points out, however, that the Observatory still stands in need of further endowment, as its new resources are necessarily largely absorbed in those new lines of research for which they were specially designed, and considerable improvements are required in the principal building; and he adds that it is probable that there has never been a time in the history of the institution when so large a return could be obtained from a given expenditure as at present. The most striking results obtained during the year have been those secured by the use of the Henry Draper Memorial Fund in the photographic study of stellar spectra, and which have been already referred to in these columns. Under the Boyden Fund several instruments have been devised and constructed for the automatic registration of the meteorological conditions and general fitness for observing of sites for Observatories, and these have been carefully tested at various elevated stations. The usual observations have also been kept up, including the observation with the meridian photometer of the magnitudes of stars in zones at intervals of 5° in the region covered by the Southern D.M. This work was about half finished, and would, it was expected, be entirely completed within the present year. The east equatorial had been used in the observation of eclipses of Jupiter's satellites and of comparison-stars for variables. A wedge photometer, arranged in a somewhat modified manner, is employed with this telescope, and is to be used in the investigation of the phases of asteroids and in the observation of zones of D.M. stars. The meridian circle is to be engaged in the observation of one of the zones required in the proposed revision of the Southern D.M.

COMET 1888 *a* (SAWERTHAL).—Dr. L. Becker has computed the following elements and ephemeris from observations made on February 18 at the Cape, March 13 at Palermo, and March 27 at Strasburg. From the outstanding deviation of the middle place it may be inferred that unless there be some considerable error in the observations the true orbit will prove to be elliptical.

T = 1888 March 16<sup>9</sup>6412 G.M.T.

$$\left. \begin{aligned} \pi - \Omega &= 359^{\circ} 49' 45'' \cdot 1 \\ \Omega &= 245^{\circ} 30' 40'' \cdot 2 \\ i &= 42^{\circ} 17' 47'' \cdot 4 \end{aligned} \right\} \text{Mean Eq. 1880}^{\circ}.$$

log q = 9<sup>8</sup>44562

Error of middle place (O - C).

$\Delta \alpha \cos \delta = -2'61s. \quad \dots \quad \Delta \delta = +7'' \cdot 1.$

*Ephemeris for Greenwich, Midnight.*

1888	R.A.	Decl.	Log $\Delta$ .	Log $r$ .	Bright-ness.
	h. m. s.	° ' "			
April 20	22 57 31	00 22' 7" N.	0 <sup>0</sup> 1517	9 <sup>9</sup> 9912	0 <sup>3</sup>
22	23 2 48	21 44' 3"			
24	23 7 58	23 2' 3"	0 <sup>0</sup> 1681	0 <sup>0</sup> 143	0 <sup>3</sup>
26	23 13 3	24 16' 9"			
28	23 18 2	25 28' 3"	0 <sup>0</sup> 1835	0 <sup>0</sup> 369	0 <sup>2</sup>
30	23 22 55	26 36' 7"			
May 2	23 27 41	27 42' 2" N.	0 <sup>0</sup> 1980	0 <sup>0</sup> 588	0 <sup>2</sup> :

The brightness at discovery is taken as unity.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 APRIL 22-28.

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

*At Greenwich on April 22*

Sun rises, 4h. 50m.; souths, 11h. 58m. 21' 1s.; sets, 19h. 6m. right asc. on meridian, 2h. 2' 2m.; decl. 12° 26' N. Sidereal Time at Sunset, 9h. 11m.  
Moon (Full on April 26, 6h.) rises, 14h. 3m.; souths, 21h. 7m.; sets, 3h. 56m.\*; right asc. on meridian, 11h. 12' 3m.; decl. 8° 39' N.

Planet.	Rises.		Souths.		Sets.		Right asc. and declination on meridian.	
	h.	m.	h.	m.	h.	m.	h.	m.
Mercury..	4	31	10	52	17	13	0 55' 3"	3 21' N.
Venus ...	4	21	10	40	16	59	0 44' 1"	3 2' N.
Mars ...	17	24	23	1	4 38*	13	7 0'	5 12' S.
Jupiter ...	21	56*	2	10	6	24	16 12' 7"	20 8' S.
Saturn ...	10	7	18	5	2	3*	8 9' 5"	20 44' N.
Uranus ...	17	11	22	49	4	27*	12 54' 3"	5 4' S.
Neptune..	6	1	13	43	21	25	3 47' 6"	18 18' N.

\* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

*Occultations of Stars by the Moon (visible at Greenwich).*

April.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.
			h. m.	h. m.	
22 ...	B.A.C. 3837	... 6	18 9	19 32	90° 173'
25 ...	65 Virginis	... 6	4 19	near approach	17 —
28 ...	$\chi$ Ophiuchi	... 6	5 46	6 44	96 316

April. h.  
24 ... 22 ... Mars in conjunction with and 3° 16' south of the Moon.  
28 ... 1 ... Jupiter in conjunction with and 3° 26' south of the Moon.

*Variable Stars.*

Star.	R.A.		Decl.		h. m.
	h.	m.	h.	m.	
U Cephei ...	0	52' 4"	81	16' N.	Apr. 22, 3 21 m
U Virginis ...	12	45' 4"	6	10' N.	23, m
V Boötis ...	14	25' 3"	39	22' N.	27, M
$\delta$ Libræ ...	14	55' 0"	8	4' S.	24, 22 4 m
U Coronæ ...	15	13' 6"	32	3' N.	24, 1 14 m
S Coronæ ...	15	16' 8"	31	46' N.	25, M
U Ophiuchi...	17	10' 9"	1	20' N.	22, 0 38 m
					27, 1 24 m
$\beta$ Lyræ... ..	18	46' 0"	33	14' N.	22, 3 0 M
U Capricorni	20	41' 9"	15	12' S.	26, m
T Vulpeculæ	20	46' 7"	27	50' N.	23, 2 0 M
$\delta$ Cephei ...	22	25' 0"	57	51' N.	22, 21 0 m
S Aquarii ...	22	51' 1"	20	56' S.	23, M

M signifies maximum; m minimum.

GEOGRAPHICAL NOTES.

THE death is announced of Nicholas von Miklucho-Maclay, at the age of forty-two years. M. Maclay's name must be familiar to our readers in connection with New Guinea explorations. He was the son of a Russian nobleman, and studied medicine and natural science at St. Petersburg and at several Dutch Universities. In 1866 he accompanied Prof. Haeckel to Madeira; in 1867 he visited the Canary Islands, and, in 1869, Morocco. He then made preparations for an extended exploration among the Pacific Islands, and especially in New Guinea. He went by South America, Tahiti, and Samoa to New Guinea, and remained for over a year, 1871-72, on its north-west coast, afterwards exploring the south-west coast to the south of Geelvink Bay. In 1874-75 he visited Further India, and especially Malacca, where he explored several districts in the interior, and obtained important results. After visiting the Pelew, Admiralty, and other island groups, Maclay again went to New Guinea (1876-78), devoting himself to the north coast, where he was now well known, and was on friendly terms with several Papuan tribes. Maclay then went to Singapore and Sydney to restore his shattered health, but was in New Guinea again in 1879, afterwards visiting several Pacific islands and going on to Sydney once more. He returned to Russia in 1882, bringing with him rich collections in ethnography and in natural history. M. Maclay afterwards resided for some time in Sydney, where he founded a biological station. He recently returned to Russia, and at the time of his death, we understand, was preparing for publication a complete account of his many years' work. At present the records of his travels, with their rich anthropological results, are to be found mainly in the Proceedings of the Batavia Society and the Russian Geographical Society.

We also learn of the death of Herr Anton Stecker, who has done some good exploring work in Africa. In 1878 he accompanied Rohlf's to Kufra, and in 1880 he went out at the expense