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MESSRS. DULAU AND CO., LTD., 34 Margaret Street, W.1, have just issued a catalogue (No. 93) of second-

hand books in zoology offered for sale by them. Upwards of 3000 works are listed under the following headings : entomology and Arachnida ; conchology and Mollusca ; minor classes ; general zoology ; Mammalia, fishes, reptiles, etc. ; ornithology and oology.

MESSRS. BERNARD QUARITCH, Ltd. (11 Grafton Street, W.1) have just issued a catalogue (No. 370) of important and rare second-hand books on natural history. Upwards of 2000 titles are listed under "General Works" and eleven classified divisions. Mr. F. Edwards (83 High Street, Marylebone, W.1) has just circulated Catalogue No. 431, which is largely devoted to publications of learned and scientific societies, and to works on the topography of the English counties.

Our Astronomical Column.

LARGE FIREBALL.—On May 21, at 12.32 G.M.T., a large meteor was observed by the well-known variable star observer, M. Felix de Roy, at Antwerp, Belgium. The object moved slowly among the stars of Leo, and left a tail of sparks like a rocket. Its path was from $169^{\circ} + 9^{\circ}$ to $155^{\circ} + 18^{\circ}$. The same meteor was observed by Mr. J. P. M. Prentice, at Stowmarket, and he recorded the path from $203^{\circ} + 1\frac{1}{2}^{\circ}$ to $179^{\circ} + 15\frac{1}{2}^{\circ}$. The duration was estimated at six seconds. Comparing the two observations the radiant point is indicated at $280^{\circ} - 33^{\circ}$ in Sagittarius. The height of the object was from about 60 to 57 miles and the velocity 15 miles per second. The meteor passed over the region from the south-west of Surrey to south of Warwick.

It is possible that the object radiated from Scorpio at $250^{\circ} - 27^{\circ}$, and that its height was 60 to 42 miles, but the observations are not quite conclusive, and more data are required.

COMETS.—There is great difference of opinion as to the magnitude of Skjellerup's comet ; Dr. Steavenson makes it mag. 9 ; other observers, mag. 12. The following approximate orbit has been deduced from observations at Heidelberg, Yerkes Obs., and Milan, on May 20, 21, 22.

T 1922, May 19, 22 G.M.T.
 ω $1^{\circ} 15' 55''$
 Ω 207 56 17
i 21 19 4
 $\log q$ 9.94569

EPHEMERIS FOR GREENWICH MIGNIGHT.

	R.A.			N. Decl.	$\log r$.	$\log \Delta$.
	h.	m.	s.			
June 2	9	38	28	36° 34'	9.9638	9.5856
6	10	18	28	40 58	9.9747	9.5680
10	11	4	53	44 39	9.9871	9.5592
14	11	57	13	47 5	0.0011	9.5600
18	12	51	8	48 2	0.0161	9.5695

The comet should be looked for as soon as the sky is dark ; its path lies through Lynx (near Alpha on May 30), Leo Minor, and Ursa Major (near Mu on June 6, near Psi on June 10). Mr. G. Merton points out that the orbit closely resembles that of comet 1830 I ; identity does not seem to be possible, but the two comets are probably portions of a primitive single comet.

The Annals of Tokyo Observatory, Tom. v., fasc. 5, contains an investigation of the perturbations of Wolf's periodic comet from 1884 to 1918, by M. Kamensky, Director of Vladivostock Naval Obs., who has revised the work of M. Thraen, finding several small corrections, which produce a marked

improvement in the comparison with observation. Definitive elements are given for each return, the perturbations by all planets except Mercury, Uranus, and Neptune having been computed. M. Kamensky notes that there will be a close approach of the comet to Jupiter at the end of 1922 ; "it will experience such large perturbations that it is doubtful whether its seventh return to the sun—provided that it takes place—will be capable of being connected with the six preceding ones by a common system of elements." It is interesting to note that Brooks's periodic comet (1889 V) also makes a close approach to Jupiter this year, about the middle of June.

Lick Observatory Bull. No. 334 contains an investigation by H. M. Jeffers of the orbits of the two components of Taylor's comet, 1916 I, which was discovered at Capetown on November 24, 1915, as a small nebulosity 20" in diameter, with an eccentric nucleus. On February 9, Barnard found the comet to be double, the two components being 10" apart ; the northern component was at first fainter, but afterwards became the brighter, and remained visible for two months after the southern one had disappeared ; the following are the definitive elements found for the two components ; perturbations by Venus, Earth, Mars, Jupiter, Saturn have been applied. They are for the equinox of 1916.0.

Epoch and Osc.	Northern Component.		Southern Component.	
	1916, Jan. 21, 0 G.M.T.			
M	-1°	32'	6".4	-1° 32' 4".9
ω	354	47	57.7	354 47 21.8
Ω	113	54	10.2	113 54 25.1
<i>i</i>	15	31	40.6	15 31 27.8
ϕ	33	7	29.6	33 6 36.6
μ	557".274		557".695	
$\log a$	0.535959		0.535740	

The linear distance between the components was least at perihelion, when it was 0.000047 astr. unit. Four months later it was 0.000168. It is noted that in the case of Biela's comet the distance was a maximum at perihelion. The elements show some resemblance to those of Daniel's comet of 1909, but identity is not possible. Taylor's comet is due at perihelion about June 13, 1922, but the conditions are unfavourable for observation ; it may, however, be detected in the autumn.

The splitting of Taylor's comet does not appear to have been caused by Jupiter ; the nearest approach in the revolution preceding 1916 was 1.1 unit, which is scarcely close enough to explain disruption.