

Our Astronomical Column.

TEMPEL'S COMET.—M. Fayet has given a very probable explanation of the discordance of the Kudara observation of this comet on May 25. He finds that its true R.A. on that day was exactly 2h. greater than the Kudara one, the declination being correct. Hence the alteration of a single figure in the announcement, which may have been set down wrong by inadvertence in preparing the message for telegraphic transmission, will make everything accordant, and further explain the fact that whereas Mr. Kudara stated that the comet was visible in a small telescope, many European observers searched in vain round the position indicated. The calculated daily motion on May 25 is +3m. 34s., N. 8', which agrees fairly well with the observed value +3m. 4s., N. 8'; the latter was probably deduced from observations extending over an hour or two. The following positions have been announced :

G.M.T.			App. R.A.			App. S. decl.			Observer	Place
d.	h.	m.	h.	m.	s.	°	'	"		
May 25	7	10 ^o	22	55	7 ^o	4	53	0	Kudara	Kyoto
July 20	14	5 ^h 6 ^m	1	52	49 ^s 48	1	17	0 ⁷	Michkovitch	Marseilles
	21	13 55 ⁴	1	55	14 ⁴⁴	1	18	58 ⁵	"	"
	21	13 12 ⁹	1	55	8 ⁶⁰	1	18	43	Mundler	Königstuhl
	22	14 35 ⁸	1	57	37 ⁵	1	21	2	Poitt	Barcelona
	24	13 40 ⁷	2	2	10 ⁶³	1	26	5 ²	Mundler	Königstuhl

The first R.A. is conjecturally increased by 2h. The following is a continuation of the ephemeris for Greenwich midnight :

	d.	h.	m.	R.A.			S. Decl.	Log r	Log Δ
				h.	m.	s.			
Aug.	20	...	2	48	26	3	55	0.1866	9.9466
	24	...	2	52	36	4	29		
	28	...	2	56	1	5	5	0.1987	9.9428
Sept.	1	...	2	58	38	5	44		
	5	...	3	0	28	6	24	0.2112	9.9400
	9	...	3	1	29	7	5		

M. Michkovitch noted that the coma appeared round, the diameter exceeding 1'. There was a well-defined nucleus of magnitude 9.8. Dr. Palisa noted that this was eccentrically placed in the coma.

STONYHURST OBSERVATIONS IN 1919.—The annual volume of the results obtained at Stonyhurst Observatory last year contains an interesting summary by the director, the Rev. A. L. Cortie, of the solar observations. The mean spot areas for 1917-18-19 are 12.1, 7.9, and 8.4 respectively, while the mean daily magnetic declination ranges in the same years are 11.8', 12.4', and 12.7'. The year 1919 probably represents the hump on the downward curve, which is frequently shown both in sun-spots and variable stars. Father Cortie associates the delayed maximum of magnetic—as compared with sun-spot—activity with the declining mean latitude of sun-spots, which increases their magnetic efficiency, since it makes them cross the sun more centrally.

The most remarkable spot group of 1919 was a triple group which was on the disc from August 13 to 25 (central about August 19). A very violent magnetic storm occurred on August 11-12; if this was connected with the spot group the discharge must have been directed tangentially, not radially, from the sun. The spot group persisted through four rotations, being last seen on December 7.

The report also gives the result of a comparison between the drawings of faculæ and the photographs of calcium flocculi. A close correspondence in position is found, so that every prominent flocculus has an accompanying facula.

A research is also in progress with the view of

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tracing the flow of faculæ in regions of long-continued spot activity. It is anticipated that this flow will prove to be connected with the cyclonic movements that produce the magnetic field in sun-spots.

THE STRUCTURE OF THE UNIVERSE.—*Science* for July 23 contains a lecture on this subject by Prof. W. D. MacMillan, of the University of Chicago. Prof. MacMillan dwells on the numerous analogies between the microcosm of atoms and electrons and the stellar universe. For example, he shows the close analogy between the two electrons of the hydrogen atom and the sun-Neptune system, the relation between their diameters and mutual distance being about the same. He gives the number of atoms in the solar system as 6×10^{55} , and the volume of the sun's domain in the stellar universe as 20 cubic parsecs, or 6×10^{56} c.c. So that, on the average, there is 1 atom to 10 c.c., which would put the atoms about as far apart relatively to their diameter as the stars.

It will be remembered that Prof. Eddington and others have recently made the suggestion that the annihilation of atoms through collision and the consequent release of their stores of energy may be going on in the hottest stars, and thus add enormously to the duration of their output of light and heat. Prof. MacMillan endorses these speculations, and adds the suggestion that the radiant heat of the stars in its passage through space may perform the converse transformation and build up matter once more from the products of such atomic collisions, restoring to them the property of mass which they had lost. He claims as a result of these agencies to have constructed a universe that is infinite, eternal, and unchangeable. But he can scarcely claim that this conclusion is based exclusively on known facts. Many of his postulates are doubtful, and rest on analogy only.

Textile Industries and Technical Education in Canada and the United States.

PROF. ALFRED F. BARKER, of the Textile Industries Department of the University of Leeds, has written an interesting report¹ of nearly 130 pages of text, accompanied by numerous photographic illustrations, of a visit paid in the summer of 1919 to Canada and the United States. In the course of the report he discusses, among other matters, the vast resources in water-power of Canada, which, used directly or in the development of electrical energy, render to manufacturing industry an immense service, and also education and educational institutions, housing, work and wages, and industrial enterprise as they came under his observation in both Canada and the States; and he offers interesting comparisons with the conditions which prevail in the United Kingdom. Prof. Barker is, however, chiefly concerned with the extent, variety, and progress of textile manufacture connected with the production of cotton, wool, and silk goods. He was everywhere given the fullest facilities for his inquiries and investigations, with the result that his observations cannot fail to be of the highest interest and value to producers and merchants engaged in these industries.

Almost all the cotton mills in the Dominion are in the province of Quebec, attributable, Prof. Barker observes, possibly to climatic conditions, to the manipulative skill and cheap labour of the French Canadian, or to some combination of all these causes with

¹ "A Summer Tour (1919) through the Textile Districts of Canada and the United States." By Prof. A. F. Barker. Pp. xi+197. (Leeds: Printed by Jowett and Sowry, Ltd., n.d.)