

prove a great convenience for water-borne grain traffic, which at present is conveyed from Fort William and Fort Arthur on Lake Superior to Montreal *via* Lakes Huron, Erie, and Ontario. The new route, embracing a total distance of 440 miles from the entrance at the mouth of French River to the city of Montreal, will constitute a saving of 282 miles. There are naturally 346 miles of navigable lake and river and 66 miles of channel, in which the requisite depth can be obtained by dredging, leaving 28 miles only of canal to be constructed. There is a rise of 98 ft. between Georgian Bay and the summit level at Trout Lake, which will be surmounted by four locks from 21 ft. to 29 ft. in lift. Succeeding this there is a fall of 659 ft. to the St. Lawrence River, necessitating twenty-three locks from 5 ft. to 50 ft. in range. The intention is to provide a waterway 22 ft. deep, to accommodate lake boats 600 ft. long, 60 ft. beam, and 20 ft. draught. The estimated outlay is 100,000,000 dollars, and the work of construction will probably take ten years to complete. The canal project will materially alter the regimen of the Ottawa River, which forms the major portion of the route. At present it is a series of deep and wide basins, connected by narrow passages, which are broken by falls and heavy rapids. For the purpose of lockage, the falls are to be concentrated and all the small rapids eliminated. The forty-five dams required for the regulation of navigation (eighteen are of considerable size) will serve to concentrate the water-power at certain points, and it is computed that nearly a million horse-power will thereby become available, though possibly not more than 150,000 h.p. at minimum flow could be developed under existing conditions.

THE "Wellcome Photographic Exposure Record and Diary" for 1919 is issued by Messrs. Burroughs Wellcome and Co. as usual. Those who are in the habit of using this pocket-book will probably be surprised to find that the exposure calculator is improved, so that when set it shows the exposure required for all the ordinary apertures of lenses instead of one only, and that this is facilitated by printing the figures in different colours. The diary, the space for classified exposures, and the pages for notes and memoranda remain as before, while the tables of the sensitiveness of the various plates and papers on the market and the general information on photographic procedure are brought up to date. The book is a model of compactness and usefulness.

OUR ASTRONOMICAL COLUMN.

SCHORR'S COMET.—The following continuation of the ephemeris of this comet, for Greenwich midnight, is from the elements given in NATURE for December 19, 1918:—

	R.A.			N. Decl.	Log <i>r</i>	Log $\Delta$
	h.	m.	s.			
Jan. 2 ...	3	57	47	13 45		
6 ...	3	58	20	14 3	0.4015	0.2390
10 ...	3	59	16	14 22		
14 ...	4	0	33	14 41	0.4144	0.2751
18 ...	4	2	13	15 0		
22 ...	4	4	12	15 19	0.4271	0.3104
26 ...	4	6	22	15 38		
30 ...	4	8	53	15 57	0.4394	0.3448

Magnitude 15.

The following observations have been received:—

G.M.T.	R.A.			N. Decl.	Observer	Observatory
	h.	m.	s.			
Nov. 29.8297	4	7	37.6	11 47 47	Burton	Washington (Naval)
30.6602	4	7	4.2	11 49 47	"	"
30.7466	4	6	59.5	11 49 56	Barnard	Yerkes "

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BORRELLY'S COMET.—This comet was observed by Mrs. Freeman with a 3-in. telescope on December 23. It is now growing fainter, but should be observable until the end of January:—

Ephemeris for Greenwich Midnight.

	R.A.			N. Decl.	Log <i>r</i>	Log $\Delta$
	h.	m.	s.			
Jan. 5 ...	6	41	18	60 19	0.1776	9.7803
9 ...	6	36	45	62 3	0.1825	9.8026
13 ...	6	32	34	63 20	0.1876	9.8256
17 ...	6	29	43	64 30	0.1930	9.8488
21 ...	6	27	27	65 16	0.1984	9.8717
25 ...	6	26	38	65 48	0.2041	9.8947
29 ...	6	26	50	66 7	0.2098	9.9171

"THE COMPANION TO THE OBSERVATORY, 1919."—This useful work of reference is similar in form to recent issues. In addition to a summary of data from the Nautical Almanac, it contains Mr. Denning's list of meteor radiant for every night of the year, and ephemerides of variable stars classified into five types (Long Period, Algol,  $\beta$  Lyræ, Cluster, and Cepheid). The pages on double stars are due to Mr. Jonckheere; he gives recent observations of 128 pairs and ephemerides for 44. There are several tables of astronomical constants. The magnetic elements for Greenwich direct our attention to the increase in the rate of change in the westerly declination. It is now diminishing at the rate of 1° in six years, and should reach zero about the end of the century.

A misprint on p. 7 may be noted. The dates of planetary quadrature and station are all printed a line too high, opposite the wrong planet's name.

REDETERMINATION OF THE ORBIT OF 588 ACHILLES.—Mme. Julie M. Vinter Hinsen undertook the rediscussion of the observations of this number of the Trojan group made during the decade succeeding its discovery in 1906 (Copenhagen Observatory Publications, No. 29). Some trouble was caused by the fact that the object observed in October, 1914, proved not to be identical with Achilles. Omitting this, all the remaining normal places could be satisfied with no errors exceeding 6". The following is the final orbit:—

Epoch and Osculation 1907 May 28 Berlin Mean Noon.

M =	84° 3' 1.9"
$\omega$ =	125° 36' 22.4"
$\Omega$ =	315° 35' 58.2"
<i>i</i> =	10° 18' 13.7"
$\phi$ =	8° 36' 13.1"
$\mu$ =	295.96333"
log <i>a</i> =	0.719179

} 1910.0

THE MANCHESTER EXHIBITION OF BRITISH SCIENCE PRODUCTS.

ON Thursday, December 26, there was opened without ceremony, in the Municipal College of Technology, Manchester, a replica of the British Scientific Products Exhibition held in August and September last in King's College, London, under the auspices of the British Science Guild. The London exhibition attracted much attention and commanded a large attendance of the public interested in the progress of applied science in the United Kingdom, especially as a result of the circumstances induced by the war. It proved that much had been accomplished despite unfavourable conditions as to the supply of certain products, some of them of prime importance, inasmuch as they rank as "key" products upon which certain great industries depend for their successful prosecution.

It was felt that the exhibition should be brought