

XXV. *Extract of a Letter from Mr. Lexel to Dr. Morton.*
Dated Peterburg, June 14, 1774.

Redde, Mar. 16,
 1775. **A**S I propose to make some researches concerning the difference of the meridians of the principal Observatories of Europe, which I am persuaded can best be ascertained by the occultations of the fixed stars by the Moon; it would be of great service to me to be furnished with the observations that have been made, or that will be made, this year, of the occultations of α or of γ Tauri by the Moon. I beg, therefore, SIR, you will please to desire Mr. MASKELYNE to communicate them to me, towards the beginning of the next year, directed to Mr. EULER, secretary of our Academy. It would also be of great use to me to have the observation of the occultation of the Pleiades by the Moon the 15th of March, 1766, in case it has been taken at Greenwich.

Here are some observations of Mr. Wargentín, of the occultations of α and γ Tauri.

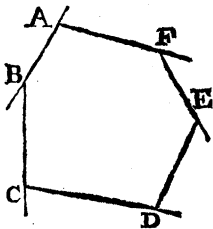
1773,

1773, Nov. 1	h' "	11 56 12	Emerfion of α , uncertain to fome feconds.
1774, Jan. 22		6 0 26½	Immerfion of the eye of γ , } both very certain.
		7 15 51	
Feb. 18		6 39 51	Immerfion of γ , very certain.
		7 19 33	Emerfion, within two feconds.

The following are my obfervations.

1773, Nov. 1	h' "	12 56 47	{ Emerfion of α almost certain; the immerfion was not obferved on account of clouds.
1774, Jan. 22		7 2 52	
		8 20 44	Immerfion, } both certain.
April 14		8 28 34	
		9 3 20	Immerfion of α , very certain.
		9 3 20	Emerfion of the fame.
		15 9 32 0	Immerfion of FLAMSTEAD'S 115 in γ .
		16 10 21 31	Immerfion of a ftar of the 6th magnitude in π .
May 22		13 2 20	Immerfion of m Virginis, very certain.

I have lately difcovered two curious theorems, which I fhall here communicate to the Royal Society.



T H E O R E M.

Let A, B, C, D, E, F, be a polygon whose fides are named a, b, c, d, e, f ; and the exterior angles $\alpha, \beta, \gamma, \delta, \epsilon, \zeta$, fo that the fide a be placed between the angles α and β , b between β, γ , &c.

$$1. \frac{a \times \sin. \alpha + b \times \sin. (\alpha + \beta) + c \times \sin. (\alpha + \beta + \gamma) + d \times \sin. (\alpha + \beta + \gamma + \delta)}{+ e \times \sin. (\alpha + \beta + \gamma + \delta + \epsilon) + f \times \sin. (\alpha + \beta + \gamma + \delta + \epsilon + \zeta)} = 0.$$

$$2. \frac{a \times \text{cofin. } a + b \times \text{cof. } (a + \beta) + c \times \text{col. } (a + \beta + \gamma) + d \times \text{col. } (a + \beta + \gamma + \delta) + e \times \text{col. } (a + \beta + \gamma + \delta + \epsilon) + f \times \text{col. } (a + \beta + \gamma + \delta + \epsilon + \zeta)}{=} 0.$$

In fact it is $\text{fin. } (a + \beta + \gamma + \delta + \epsilon + \zeta) = \text{fin. } 360^\circ = 0.$
 and $\text{cof. } (a + \beta + \gamma + \delta + \epsilon + \zeta) = + 1.$; but in order to give the same form to the two expressions, I rather chose to represent them as I have done. By means of these two theorems the solution of polygons will be as easy as that of triangles by common trigonometry.