OPTICS. – *On the asymmetry of the optical space and the laws of reflection.* Note ([1]) of M. ERNEST ESCLANGON, presented by M. Deslandres.

The following observations that I have the honor to present to the Academy seem to reveal an optical asymmetry of celestial space, as reflected by terrestrial observations.

The telescope L is a rotatable about a vertical axis (altazimuth at the Observatory of Strasbourg, F = 1m, 50). In front of the objective lens O is mounted a first mirror M whose normal makes an angle of about 55° with the optical axis FO. The rays coming from the horizontal wire F of the reticle are reflected after leaving the lens, the mirror M and then normally on a second mirror M', followed by the same route in reverse, back in F. A lamp placed in L lights the wire F that can be seen along with its mirror image through the microscope eyepiece m. The mirrors M, M' and the lamp l are *integral* with the optical device. The wire F is mobile and its vertical movements measured by a micrometer screw. The procedure is as follows for the observations, although very delicate. The optical device is placed horizontally in the *north-west*, is brought into coincidence the wire F and its image, which, in this position, defines the direction *relative to the telescope*, the beam returning on itself. Ten coincidence readings are made in this position, then the optical device is rotated gently, without touching it directly, around the vertical axis of the instrument to bring in the *north-east*, so many times. An observing session includes 25 to 29 uninterrupted series

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([1]) Meeting of 19 December 1927.

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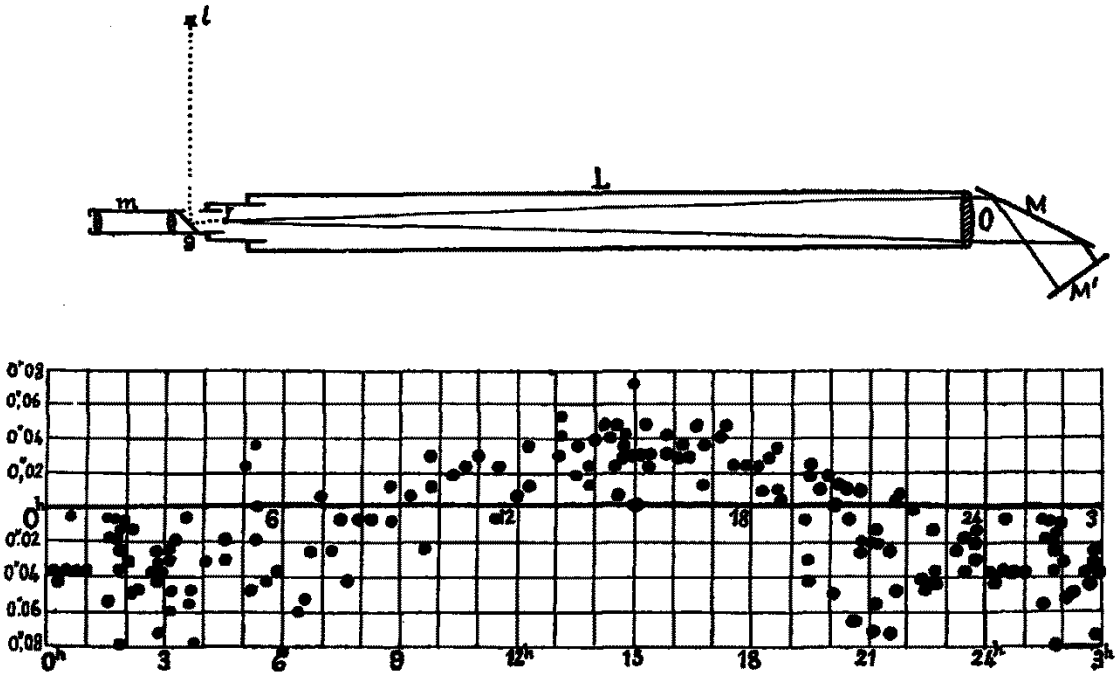
of observations and alternative positions in the northwest and northeast.

But there is a systematic difference between these two systems of readings, *a difference that depends only on the mean sidereal time of the observation session*; that is to say, the orientation of the celestial sphere of fixed stars to the instrument. The figure below shows the result produced by



150 sessions that included 40,000 points of observation. The abscissa spans the sidereal hours, the ordinate differences P–P′ (readings northwest and northeast), each point represents the average provided by a session. The comments I started in this form in February 1927 and continued to correspond regularly for the most diverse solar hours, both day and night, in the summer season as well as winter. Ordered according to mean solar time, the observations are scattered in no apparent order, without defining any curve outside of the x-axis O which represents the average, this character indicates that the motion of the Earth in its orbit around the Sun, to the degree of precision obtained, is foreign to the phenomenon. The experimental technique is exactly the differential; observations are made with artificial light (closed dome) and only on cloudy days when the temperature is very constant. Systematic errors may come from light bending, etc., are perfectly eliminated.

In summary, the ray that is reflected on itself occupies, *with respect to hardware system* consisting of the optics and mirrors, *a variable position, the sole dependence, the degree of precision experiments, on the orientation of the telescope with respect to the celestial sphere of fixed stars*. The difference P–P′ values ranged between –0.036 and +0.036 arc seconds for 3h and 15h respectively; they cancel at around 9h and 21h; hours corresponding to the meridian transits of the optical axis of symmetry (if there is a symmetry axis of this asymmetry in space).

What is the origin of this asymmetry? It comes from the absolute motion of our star system? Categorical explanations would be too premature; the question for now belongs to the purely experimental field.