Letters to the Editor.

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The Observation of the Opposition of Eros.

IN *Astronomische Nachrichten*, No. 5722, is published an article "Zur Beobachtung der Eros-Opposition", by Prof. Hartmann, in which certain recommendations are made to those who will be co-operating on the observations of Eros around the forthcoming opposition.

As chairman of the Solar Parallax Commission of the International Astronomical Union, I desire to state that some of these recommendations cannot receive the support of the Commission. Prof. Hartmann recommends that observations should be limited to the period 1931, Jan. 1 to Feb. 26, and that they should be secured at intervals of four days throughout this period, except that from Jan. 25 to Feb. 6—when the parallax of Eros has practically its maximum value—observations should be secured daily. Southern observers are recommended to obtain daily observations, in addition, on Mar. 14–18, when Eros is near a stationary point. He further recommends that observations should be secured at large east and west hour angles only, and states that observations on the meridian, between a northern and southern observatory in co-operation, are not to be recommended in view of the possibility of observations being frequently secured at one of the co-operating observatories and not at the other. He considers that the advantages of the co-operative and practically simultaneous observations—elimination of the errors of positions of comparison stars and of the ephemeris of Eros—do not outweigh the loss of weight in parallax factor as compared with observations by the east-west method.

The co-operative programme of observations has for its purpose the accurate determination of (1) the solar parallax, (2) the mass of the moon and other related constants. In so far as (1) is concerned, limitation of observations to the period recommended by Prof. Hartmann would undoubtedly provide adequate weight for the derivation of the solar parallax, if weather conditions were satisfactory throughout the period.

It must be remembered, however, that observing conditions at this time of year at most places in the northern hemisphere are not generally satisfactory, and that long spells of cloudy or unsettled weather are possible. By the end of February Eros will have moved too far south to be accessible to most of the co-operating observatories in the northern hemisphere, and if observations have been unduly interfered with by bad weather, it will then be too late to obtain additional material. From this point of view, it is desirable that northern observatories should secure observations before Jan. 1. From the middle of November the parallax of the planet is greater than 20″, increasing to nearly 40″ at the end of December; observations during this period can add appreciable weight to the derivation of the solar parallax. Observers in the southern hemisphere are more fortunate in that Eros is first accessible when its parallax is near its maximum value, and the extent to which observations need be continued as the parallax decreases will be conditioned by the weight of the material already accumulated.

As regards (2), observations over as long a period as possible are required in order to cover a number of lunations and so enable the lunar equation term to be more satisfactorily disentangled from the errors of the ephemeris of Eros. In this connexion, the experience of Mr. Hinks on the discussion of the observations secured at the 1900–1901 opposition (when the maximum parallax was only 28″) may be recalled (*M.N.R.A.S.*, **70**, 63, 1909): "For the parallax determination the observations made after Christmas 1900 had very little weight. But, on the other hand, it will appear that the part of the series most valuable for the determination of the mass of the moon is the latter half, from the middle of December to the end of February. It is fortunate, therefore, that some observers persevered throughout the unfavourable months of January and February, 1901, after those whose main interest was the solar parallax had stopped work." Dr. Jackson (*M.N.R.A.S.*, **90**, 742, June 1930) has recently directed attention to the discordance between the observed and theoretical values of the constant of nutation and the importance in this connexion of a determination of the mass of the moon. It is hoped that all observers will plan their observations with the view of providing material for the determination of the mass of the moon as well as of the solar parallax.

With regard to the co-operative observations between northern and southern observatories, these are not being planned to the exclusion of observations at large hour angles, but will be in addition to them. Observations obtained at one observatory, when conditions are unfavourable at the other, need not be wasted, as such observations can be utilised in connexion with the derivation of the errors of the ephemeris of Eros and of the mass of the moon. On the other hand, the simultaneous observations at the two observatories are ideal for the derivation of the solar parallax, being entirely independent of errors of comparison star places and of the ephemeris of Eros.

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A Simple Lecture Demonstration of Lattice-'Planes' in Two Dimensions.

STUDENTS frequently find some difficulty in picturing lattice-planes in X-ray crystallography, and in their elucidation, apart from isometric drawings and models of crystal forms and lattices, recourse is usually made to drawings of a two-dimensional lattice. I venture to hope that the following simple demonstration may be of service to those who have to lecture on this subject.

The device is an adaptation of the lecture-demonstration of optical diffraction patterns projected on a screen across the lecture theatre—a demonstration which is not so often shown as it deserves to be. By means of a condensing lens, the light from an arc is focused in front of a narrow slit, so that the length of the slit is filled with light, and a thin pencil of light passes beyond the slit to the diffracting object, placed (say) one foot away from the slit. In these circumstances, beautiful diffraction patterns of wires, straight-edges, needle-points, etc., can be readily observed by the audience on a screen placed several yards away. It is often advantageous to tilt the screen and so broaden the fringes.

If, in this arrangement, the diffracting object is replaced by an ordinary square-mesh wire gauze arranged normally to the incident light, it becomes