is of the first order of magnitude. Then the fifth-order coefficient J_5 for the earth is comparatively large.

We have solved the equations of motion by applying H. Andoyer's method, which appeared in *Bull. Astron.* **20**, 1903. The present equations are very similar to his except for the sign of some coefficients. In Andoyer's case, which is related to the asteroidal problem of the commensurable mean motion, the coefficient β' is always positive, but in our case, β' is given by

$$\beta' = \frac{2}{3} (J_2 + J_4/J_2 - J_3^2/J_2^2) (a_0)^{-2},$$

which can be positive or negative. For the earth, this expression is negative; the treatment must be changed accordingly. Thus a new criterion, dividing into several cases, must be necessary.

This work was performed under NAS-NRC Resident Research Associateship.

Depth of Formation of MgI Lines in the Solar Spectrum. R. GRANT ATHAY, *High Altitude Observatory and University of Colorado*.—Estimates of optical depths in MgI lines are made from their shapes and intensities in the Fraunhofer spectrum, their chromospheric intensities, and by computation using a model atmosphere. Curves are derived showing the relationship between the surfaces $\tau=1$ and geometrical depth in the solar atmosphere as a function of wavelength from line center.

Photoelectric Recording of Astronomical Seeing. H. W. BABCOCK, *Mount Wilson and Palomar Observatories and Carnegie Institution of Washington, California Institute of Technology*.—An instrument has been built and tested for objectively and continuously monitoring the quality of astronomical seeing. A reticle in the form of a fine grid or lattice is placed at the focus of a small telescope, which is pointed at Polaris. Image tremor (imperfect seeing) causes fluctuations of the light passing the reticle and entering a photomultiplier, thus producing a Fourier frequency spectrum. (The component due to scintillation can be distinguished by occasional defocusing; it is generally of secondary importance.) The signal is analyzed with the aid of an ac amplifier, bandpass filter, rectifier, and recorder. Tests at Mount Wilson have shown that the instrument discriminates well among various grades of seeing, and that it can be calibrated by comparison with large telescopes.

Light-Curve of RV Ari Obtained by Means of an Image Orthicon Tube. GUSTAV A. BAKOS AND JUSTUS DUNLAP, *Dearborn Observatory and Organ Mountain Station*.—An attempt has been made to use the image orthicon system of the Organ Mountain Station for recording the light changes of a fast variable, RV Ari. This RR Lyr variable has a period of 2^h15^m and an amplitude of 0.65 mag.

The kinescope screen was photographed on a 35-mm film every 15-min and the diameters of the images of the variable and a comparison star were measured. The measures were converted to a magnitude scale by means of the formula

$$m_{\text{var}} = m_{\text{comp}} + b(D_{\text{var}} - D_{\text{comp}}).$$

The points, compared with a photoelectric light curve, show an average deviation of 0.04 mag. This figure agrees closely with other estimates of photometric accuracy of the image orthicon system made previously by one of the writers.

Spectroscopic Observations of the Galactic Nova of 1963. A. H. BATTEN, E. H. RICHARDSON, AND K. O. WRIGHT, *Dominion Astrophysical Observatory*.—The bright nova discovered on 5 February 1963 has been observed at Victoria on every suitable night since its discovery was announced. The single-prism spectrograph, giving a dispersion of 30 Å/mm at $H\gamma$, was used at the Cassegrain focus of the 72-inch telescope to obtain spectrograms in the normal photographic region and at $H\alpha$. Various grating combinations were used at the coudé focus of the 48-inch telescope to obtain spectrograms from 3000 to 9000 Å. The dispersions used were 2, 5, and 10 Å/mm in the ultraviolet and visual regions, and 30 Å/mm in the infrared.

Even the earliest spectrograms showed characteristics generally associated with the post-maximum development of a nova. The principal spectrum showed strong hydrogen lines, and strong lines of Ca II and Fe II. Also present were sharp lines (half-width about 0.7 Å) of Ti II, Fe II, Fe I, and O I. Strong lines of O I were also seen in the infrared. Also present was the diffuse enhanced spectrum consisting of lines of hydrogen, Fe II, Ca II, and Mg II. This last faded very rapidly. Emission was associated with the hydrogen and Fe II lines, and to a lesser extent, with the Ca II lines. Some broad lines of the Orion spectrum (half-width about 3 Å) were clearly identifiable even on 9 February. They include lines of He I, O II, and N II.

Velocity displacements were measured on the one-prism spectrograms. The principal spectrum showed a velocity of approach of 840 km/sec on 9 February increasing steadily to 1230 km/sec on