RADIAL VELOCITIES WITHIN THE GREAT NEBULA OF ORION

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The *Astrophysical Journal* for October, 1914, contained an important paper by MM. Bourget, Fabry, and Buisson of Marseille, summarizing the results of their application to the Orion nebula of the photographic interferometric methods of M. Fabry. They found variations in the radial velocity from one point to another within the nebula, differences as large as 10 km. per second at points quite close to each other being indicated by local deformations of the interference rings. They also detected graat collective movements, the northeastern region receding, and the southwestern region approaching, relatively to the mean velocity at the trapezium, with velocities of about 5 km. per second.

It seemed of interest to repeat these determinations independently by the standard spectrographic method, and toward the close of the winter observations were begun at Yerkes Observatory with the Bruce spectrograph, arranged with a dispersion of one prism. The radial velocity was inferred from the displacements of the hydrogen lines β and γ and the lines of nebulium at λ 5007 and 4959. At the position of the western star of the trapezium, No. 619 in Bond's catalogue of stars in the nebula, the radial velocity of the nebula was found from measures of eight plates (taken occasionally during the past eleven years) to be $+15.6 \pm 0.5$ km. per second (recession). This is the mean of independent measures of each plate by the writer and Mr. C. A. Maney, and it agrees almost exactly with the value of $+15.8$ km. found by the observers at Marseille for the region of the trapezium.

For several other positions around the trapezium, and not over 2′ from it, we obtained values ranging from $+6$ to $+17$ km. The probable error for the velocity at one point, from the mean of measures by the two observers of a single plate, should be about ± 1.5 km., so that the reality of the difference may be regarded as fully confirmed. Exposures of from two to three hours were required at some of the positions, so that the accumulation of plates was slow, and additional observations will be required when the 'open season' for Orion returns.

We must accordingly alter our conceptions of the nebula as an enormous mass of quiescent gas, and regard it as seething with local whirlpools besides perhaps having a considerable motion of rotation as a whole.