Our observations show that points occur generally on the outer edge of the penumbra of spots. They are very small, only fractions of seconds of arc. They are numerous—three or four per spot. Average life times are of the order of nine minutes, but may be as short as two. They are recurrent.

Points frequently have been observed to be at the base of small active dark flocculi. Our observations to date indicate little or no positional relationship between points and major flares, even though the latter have broken out in the field during well controlled observations of points. The generality of points in the neighborhood of inactive as well as active spots suggests that they should be considered as part of normal spot development.

Ellerman, F. 1917, *Ap. J.* **46**, 298.

Lyot, B. 1944, *Ann. Astroph.* **7**, 31.

Severny, A. B. 1956, *Observatory*, **76**, 241.

*McMath-Hulbert Observatory,
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Pontiac, Mich.*

Osterbrock, Donald and Flather, Edith. Electron densities in the Orion Nebula, II.

New observations are presented of the $[OII]$ $\lambda 3729/\lambda 3726$ intensity ratio at various points in the Orion Nebula. These observations were made at positions selected to fill in gaps in the series reported in an earlier paper (Osterbrock 1955), and they approximately double the number of points for which this intensity ratio is known. In addition, approximate relative intensities of $H\beta$, of the $[OIII]$ green lines, and of $[OII]$ $\lambda 3726 + \lambda 3729$ have been determined for all the points.

On the basis of these observations, the law of variation of electron density with distance from the center of the nebula is derived. The densities range from 2×10^4 electrons per cm^3 near the Trapezium to 3×10^2 electrons per cm^3 in the outer parts of the nebula. Comparison of the model derived in this way with published optical surface-brightness measurements and with radio flux-density measurements shows that there are pronounced density fluctuations in the Orion Nebula, and permits an estimate of the size of these fluctuations to be made.

Osterbrock, D. E. 1955, *Ap. J.* **122**, 235.

*Mount Wilson and Palomar Observatories,
Pasadena, Calif.*

Rinehart, John S. On the nature of the meteoritic debris at the Arizona Meteorite Crater.

As previously reported (Rinehart 1958), the Smithsonian Astrophysical Observatory sent an expedition to the Arizona Meteorite Crater in the summer of 1956 to determine the nature, amount, and distribution of meteoritic debris about the crater. Numerous physical, chemical, and metallurgical tests have now been made on the many samples collected and their physical natures and individual distributions established. Particles in various stages of metamorphism are represented. Small metallic, occasionally partly oxidized, spheroids form the bulk of the material. The spheroids are high in nickel, 15 to 20 per cent. They may have been molten at some time but do not seem to have cooled suddenly from a molten state. It is doubtful whether they condensed from vaporized metal. They could be remnants of disintegrated solid masses. The spheroids are confined to regions, principally to the northeast of the crater, where the quantity of meteoritic material is relatively high. Oxidized meteoritic material forms most of the remainder although an occasional particle has been heated to a high temperature and quenched rapidly and some have not been heated at all. A significant percentage of particles are clusters made up of small quartz crystals and grains of meteoritic oxide cemented together. The observations are consistent with impact from the southwest, with large amounts of material being thrown north-eastward by the impact.

Rinehart, J. S. 1958, *Smithsonian Contributions to Astrophysics* **2**, No. 7.

*Smithsonian Astrophysical Observatory
and Harvard College Observatory,
Cambridge, Mass.*

Underhill, Anne B. A wave-length study of the spectrum of HD 188001, η Sagittae.

Twenty-one high and moderate dispersion spectrograms of η Sagittae have been measured for wave length over the region $\lambda 3100$ to $\lambda 6700$. The spectrum consists of the well-known, broad O-type absorption lines and very many narrow, sharp, shallow absorption lines which may be formed in a shell. Altogether 1247 lines were measured of which 333 cannot be identified.

The following spectra were identified:

definitely present: $H I$, $He I$, $He II$, $C II$, $C III$, $C IV$, $N III$, $N IV$, $O III$, $O IV$, $Ne II$, $Mg II$, $Si IV$, $P III$, $S III$, $K III$, $Ti IV$, $Fe III$.