

with the Crossley reflector at the Lick Observatory. It has developed that a great number of the nebulae, though of an extent and form that differentiate them from stars, yield continuous spectra. A further application of the spectroscope, through the circumstance that an approaching or receding star will show the characteristic lines of the elements displaced to an extent determined by the velocity of approach or recession, has disclosed the fact that many stars are attended by an unseen companion and has thus created an astronomy of the invisible. It is found that, as in the case of visible binaries, the two bodies move round each other in a way in accord with Newton's law of attraction so that with a constitutional unity of the universe we have, at least, one law that seems to be generally valid.

It is in place now to bring together the more essential facts revealed to us by the different methods of investigation: we have

(1) A sun and its attendant planets separated from other celestial objects by distances vast almost beyond comprehension by beings who may speak freely of the ninety or more millions of miles that separate our earth from the sun. This system, independently of the relative motion of its parts, is moving, as a whole, at a great velocity toward the constellation Hercules.

(2) In the vast depth of space is a great wilderness of stars — probably 100,000,000 of magnitude not below 17. These are far from being uniformly distributed throughout the sky, being very markedly condensed towards the Milky Way. The Milky Way itself seems to be a great system with respect to which our solar system occupies a somewhat central position. Round us it seems to coil probably in a widening spiral.

(3) Joint tenants of the deeper space with the stars are the nebulae, the number of which estimated by Keeler in his photographic survey is probably 120,000. Comparatively few are gaseous, and these lie near the Milky Way. The stellar nebulae — those with a distinct nucleus surrounded by nebulous matter — shew a like affinity. The spiral nebulae constitute the numerous class of nebulae; they avoid the neighborhood of the Milky