DISCUSSION

In the period following the papers on instability among the hot stars of low luminosity, Dr L. Gratton presented a brief account of work in progress on η Carinae by Dr Platseck, Miss Ringuelet, and himself at Córdoba and La Plata. The bright line spectrum of η Carinae is being studied in detail; one interesting observation is that the emission lines of Ti II are quite weak as compared to their intensities in novae of comparable excitation. The Balmer lines are also faint. The hydrogen emission lines consist of fairly wide structures upon which are superimposed narrow emission cores, as well as absorption features. The La Plata workers find that the narrow emission lines originate in the nuclear star, while the bright lines that arise from the nebulosity in the immediate vicinity are very wide, their breadths corresponding to a velocity range of 500 to 1000 km./sec. The radial velocities vary greatly from one part of the nebula to another. Gratton and his colleagues believe that η Carinae is actually a member of the Carina O-association upon which it is seen superimposed. The corrected distance modulus of this complex is 12·3 magnitudes, with an uncertainty of less than half a magnitude. It follows that η Carinae at its maximum in 1843 had an absolute magnitude almost certainly exceeding -13, and even now is a fairly luminous object of $M=-5$ or -6. The La Plata astronomers believe it to be improbable, therefore, that η Carinae is a nova-like variable or a super-nova, but think rather that the object is to be regarded as similar to S Doradus or Hubble's variables in extragalactic nebulae. They comment on the probable membership of both S Doradus and η Carinae in O-associations, and suspect that this connexion may be of great evolutionary significance.

Dr E. Kharadze stated that he found the report of Walker on the light variations of old novae to be very interesting and important, and described recent work of his own on P Cygni, an object of interest from this point of view. Kharadze believes it is possible that P Cygni, because of its large dimensions and high luminosity, might suffer disturbances of the equilibrium between gravity and light or gas pressure, at least in its outer layers. He and Dr Magalashvili, at the Abastumani Observatory, have been making regular observations of the brightness of P Cygni since 1952, and have found variations exceeding 0·2 or 0·3 magnitude. For example, in July 1952 a decrease of light by 0·2 magnitude was observed, but the brightness recovered in the following 10 days. Similar, or even more striking variations occurred in 1954. In yellow light the light variation was noticeably prompter. Dr Kharadze commented that the magnitudes of P Cygni, and of P Cygni-like stars, deserve regular observation.

Dr E. Schatzman drew attention to the theory he has proposed for the origin of the novae, and which seems to him to be confirmed by the work reported by Walker. The novae must be stars very near a state of instability, and a secular change of structure would lead to an explosion. Schatzman pointed out also that should a white dwarf approach instability, the period of its pulsation would be of the order of 2 sec.