A COMPOSITE COLOR-MAGNITUDE DIAGRAM FOR A NUMBER OF VERY POOR CLUSTERINGS IN THE MILKY WAY

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There are indications of the presence of numerous stellar clusterings in the Milky Way which are so poor and unconspicuous that they become detected merely by accident. The true frequency of such objects is probably considerable as there is reason to believe that only a minor fraction has been detected.

The candidate objects in the present investigation have been revealed by couples of apparently identical spectra appearing with so small angular separation on objective-prism plates that they form a conspicuous configuration at visual inspection. The observed frequency of such coincidences significantly exceeds the expected random frequency. In rather few cases it has been impossible to detect additional clustering members but the few solitary couples found may be interpreted as the ultimate remnant of a dynamically disintegrating cluster, formed by its most massive stars.

Tentative V vs. B-V diagrams have now been drawn for a number of candidate objects in the Carina-Crux-Centaurus region. Each object consists of the coincidence couple and a few stars (10-30) in its nearest surrounding, for good reasons suspected to be fellow clustering members. Subsequently, all diagrams have been superimposed in order to form some kind of a blurred "average loose clustering diagram". In an idealized case, the relevant points should form a distinct pattern in the diagram whilst the irrelevant ones should tend to be more homogeneously distributed. A recent detail investigation of a selection of candidate objects, including studies of scanned slit spectra, gives an indication of an extremely high frequency of multiplicity. As a practical consequence of this fact one has to consider the occurrence of multiple stars as responsible for a considerable part of the scattering of the points in the diagram.

In order to standardize the diagrams with respect to the position of the sequences, an AO-age-zero point has been indicated in each diagram, basically by means of the objective-prism spectra of relevant stars. At the superposition every such point has been placed at the same spot in the

A. Maeder and A. Renzini (eds.), Observational Tests of the Stellar Evolution Theory, 117–118.

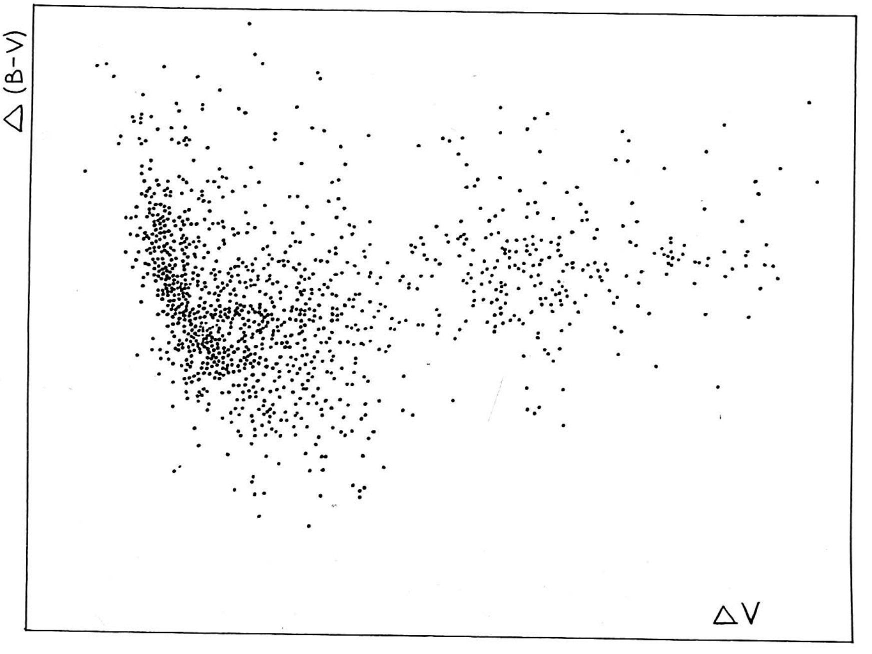

diagram. The final result is shown in the figure above which represents about 50 candidate objects and 1400 stars.

By means of the figure one may then draw some conclusions which are particularly interesting with respect to problems concerning stellar evolution, for instance:

1. A majority of the candidate objects are closely related to ordinary open clusters (a few of them might be considered as an apparent intermediate configuration between multiple system and open cluster - typical "micro-cluster").

2. As the true frequency of such objects must be very high, it is reasonable to believe that most stars (if not all) are born within clusters or associations of various types.

3. The "typical" turn-off point indicates a "typical" age of about 150 million years and a range from 50 to 200 million years.

4. There is a pronounced deficiency of stars on the main sequence below A2 in these clusterings (as in ordinary open clusters).

An interesting question is: To what extent is the difference in cluster appearance conditioned by a difference in the state of dynamical disintegration?