5. THE PROPOSED REVISION OF THE ALBANY GENERAL CATALOGUE

W. Fricke

At the Astrometric Conference, held in May 1959 in Cincinnati, a resolution was adopted which urges that the Albany General Catalogue be revised, with the omission of certain stars for special reasons and the addition of supplementary stars. This resolution was the result of a discussion after D. Brouwer (*A.J.* **65,** 186, 1960) had presented an interesting paper on a method of constructing a revised General Catalogue. Before entering such a great undertaking it seems necessary to estimate whether an essential improvement of positions and proper motions of the GC, systematically and individually, can be reached at the present time.

As G. van Herk and A. J. J. van Woerkom (*A.J.* **66,** 87, 1961) pointed out recently, there are modern meridian catalogues which show systematic differences against each other of the same order of magnitude as catalogues based on old observations. In view of the large number of catalogues incorporated in the GC, one might conclude that no appreciable systematic improvement can be expected by addition of the available modern observations. However, after the completion of the fourth Fundamental Catalogue at the Astronomisches Rechen-Institut (FK 4), it turned out that appreciable systematic corrections could be derived for the right ascension system, which is based on absolute observations after 1900, and that also the corrections to the declination system, which is based on observations from about 1840 onwards, are by no means negligible. The individual corrections, which are based on all observations included in FK 3 and in modern catalogues, have already proved to give an effective improvement of the accuracy. From recent observations with Danjon's impersonal astrolabe, Guinot was able to show that suspected systematic errors in FK 3 are no longer present in FK 4. The reason for the individual and systematic improvement is (1) a more critical weighting of older catalogues, and (2) the quality of modern observations which are essentially free from well-known deficiencies of catalogues prior to 1900.

It can thus be stated that, from the experience with the revision of FK 3, a revision of the GC should result in a very effective improvement of positions and proper motions. It must be doubted, however, whether a more reliable system than that of FK 4 can be constructed at the present time. Therefore, a revision of the GC should start with a reduction of positions and proper motions of GC stars into the system of FK 4, a procedure which demands special investigations of the magnitude effects for fainter stars. From then on an individual revision of the data of all stars should be carried out.

For the northern hemisphere quite a number of more recent meridian catalogues and the AGK 3 will make an important contribution to higher accuracy. Also, in the southern hemisphere, modern meridian observations of GC stars carried out at the Cape, as well as photographic positions, are available. In view of the planned southern meridian programme similar to the AGK 3R, however, the last steps of the southern part of a revised GC should be postponed until the star positions of this programme become available. The great importance of the southern meridian programme is generally recognized. For the improvement of the positions of brighter stars the recommendation of IAU Commission 8 should not be forgotten. This urges the use of astrolabes in a chain of conveniently distributed stations down to latitudes as close as possible to $-60°$.

As to the techniques of revision of GC our experience with the formation of the FK 4 warns us against a premature formulation of a fixed procedure. For example, the extent to which older observations have to be omitted is one of the questions which have to be investigated in the course of the work. From the very beginning, however, it is clear that the analysis of such a vast body of data makes imperative the most efficient use of modern documentation

and computation facilities. All observational data are needed in machine-readable form, preferably on punched cards, and all steps of the revision programme are to be carried out on an electronic computer. The first step is therefore the key-punching of those old and new star catalogues which have to be incorporated into the General Catalogue. (For future publications of observational and other catalogues the publishing institutions themselves should make their catalogues available on punched cards.) The Astronomisches Rechen-Institut will distribute a list of star catalogues which are needed with highest priority on punched cards, and an enquiry shall determine whether assistance in key-punching can be expected.

The existence of star catalogues in machine-readable form (e.g. on punched cards) is a necessary condition not only for the formation of a General Catalogue but also for any kind of future analysis of observed star positions. In the past it was only in rare cases that all the star positions in observational catalogues were analysed. In the future, however, it will be easily possible to make use of the full amount of information contained in the observations. The key-punching of the old and new star catalogues—if shared by various institutions—can be expected to be completed within a few years. After all necessary data are on punched cards, the formation of the revised General Catalogue when carried out on an electronic computer will be feasible in well-controlled steps in a reasonable time. The programming of the various steps for the electronic computer is under way at the Astronomisches Rechen-Institut.

6. WHAT DATA WILL BE PROVIDED BY THE AGK3?

W. Dieckvoss

For the region of declination $-2^{\circ}\cdot5$ to the northern celestial pole the plates of the AGK 2, comprising the zones Bonn, Bergedorf and Pulkovo, have been repeated at Bergedorf. All stars contained in the photographic part are measured and proper motions have been derived.

The final AGK 3 catalogue will thus give proper motions of 180 000 stars with mean errors of $\pm 0''\cdot008$/year. Those stars belonging to the meridian circle work of the AGK 2 (printed in the relevant volumes under the headings 'Babelsberger Meridianbeobachtungen') will be omitted. Also other double stars with uncertain co-ordinates will be omitted.

The system of the AGK 3 will be the FK 4. Spectral types and photographic magnitudes will be included and, in a belt of 20° width around the galactic equator, colour equivalents also.

Extensive tables in the introduction will provide means of correcting the positions of the AGK 2 for errors depending on magnitude and colour.

With these 180 000 absolute proper motions in a unified system a basic material will be available to bring other catalogue work to a unified system, especially the immense Yale-zone work.