type stars situated within 15° of the north galactic pole. Within 12.5° of the pole, observations of both types are available for all (66) of the stars of HD types A2 or earlier, and data are also available for eight fainter BD stars. The faintest star considered has $V=10.8$.

Six peculiar A stars and 19 metallic-line stars were found, as well as several other unusual objects. The U , B , V photometry is discussed both in terms of its application to the problem of selective absorption in this direction and in terms of its implications concerning the nature of the stars involved. Many of the stars, including some of the faintest, lie very near the normal $U-B$, $B-V$ plot, indicating that the selective absorption, in general, is too small to be determined by this method. The stars deviating from the normal curve in such a way that they might be thought to be reddened do not, in fact, appear to be so.

On the Design of a Photographic Star Map with Coordinate Grid. A. BRANDENBERGER, *Ohio State University*, AND H. B. WACKERNAGEL, AFCCDD (CCSTN), *L. G. Hanscom Field, Bedford, Massachusetts*.—A new and unique star map is in the process of being constructed by the Institute of Geodesy, Photogrammetry and Cartography of the Ohio State University for the National Space Surveillance Control Center. The atlas will cover the entire sky and contain a coordinate grid, epoch 1950.0. The primary purpose of this atlas is to obtain quickly, and with an accuracy of approximately one minute of arc, the positions of artificial earth satellites and space probes from film exposed with a Baker-Nunn satellite-tracking camera. This atlas will be useful for many other projects as well, e.g., for a search for comets. The construction and use of such an atlas was originally suggested by G. Miczaika. The project initiation was done under his supervision.

The atlas consists of 212 sheets, 94 each for the northern and the southern calotte and 24 for the equatorial belt. Each sheet covers an area of 15° by 15° in gnomonic projection. The atlas sheets are mosaicked together from nine 5° by 5° pieces cut from 30° by 5° frames obtained with two of the Mark-II Baker-Nunn cameras. The pieces are aligned with the help of $9 \times 3 = 27$ match stars, for which the position has been computed in the gnomonic projection. The two hemispheres are photographed by the cameras in California and in Chile.

The scale of the atlas corresponds to a nominal focal length of 500 mm. The optimal projection distance for minimizing the scale differences is 496 mm. The edition to be used in conjunction with the Baker-Nunn cameras is mounted between glass. These glass plates fit into the special blink microscope.

A second edition on photographic paper and with a scale corresponding to a focal length of 1000 mm will probably be published at a later date.

The Ottawa Mirror-Transit Telescope. GEORGE A. BREALEY, *Dominion Observatory* (introduced by MALCOLM M. THOMSON).—The design of the Ottawa Mirror Transit, which is located near the main building of the Dominion Observatory, is well advanced and some preliminary test observations have begun.

It is housed in a well-insulated building which is cooled in order to hold the instrument at anticipated nighttime temperatures. The north and south ends move apart on rails, completely exposing the instrument and giving a clear line of sight to within 13° of each horizon along the meridian.

An 11-inch diameter, 2-inch thick quartz mirror is held in the central axis with its plane in the axis of rotation. The mirror reflects the starlight into either one of two horizontal telescopes, which are each of 10 inches aperture and 168 focal length, there being a gap of some 160 inches between the two objective glasses with the axis assembly midway between. Each telescope can "see" 20° or more beyond the zenith, providing a convenient overlap.

The direction of the mirror normal is obtained from four, or possibly six, of the conventional microscopes, having objectives of five inches focal length, magnification $6\times$. These photograph the divided circle, which is marked in three-minute intervals. The behavior of the mirror in its various attitudes is determined by autocollimating telescopes which view small mirrors cemented to the east and west flanks of the main mirror.

Two bright-wire recticles, one fixed, and one movable with the star image, are placed, face to face, at the prime foci of the telescopes; and all images are transported about six inches by unit magnification to the film plane. Observations may be by photographic or visual means, the lead screw in either case being driven at the correct velocity by an analogue computer.

Early Solar Evolution. R. R. BROWNLEE AND A. N. COX, *Los Alamos Scientific Laboratory, Los Alamos, New Mexico*.—Using fully time-dependent nonlinear and nonadiabatic equations pertaining to stellar structure, the early evolution of a nonrotating solar mass of composition $X=0.744$, $Y=0.236$, $Z=0.02$ has been computed. Features such as the path on the bolometric magnitude vs log effective-temperature diagram, the time scale, the burning of primordial deuterium, and the depth of the hydrogen convection zone at various times are discussed. Comparisons are made with the earlier work of Henyey *et al.* For the hydrogen convective layer special