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Digitization, Measurement, and Analysis of a 1905 Barnard Atlas Photographic Plate

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In the second paper in a series on observatory data digitization, we improve on our previous demonstration of the ability of a commercially available graphic arts scanner to aid the production of scientifically useful scans of astronomical photographic plates. We describe a method using freely available software to extract magnitude measurements from the star images on sky-survey plates, which reside in observatory archives worldwide. We detail the use of this method on one plate in particular, Plate 8 in E. E. Barnard's A Photographic Atlas of Selected Regions of the Milky Way; examine the effects of our scanning method on our magnitude measurements; discuss the difficulties encountered when measuring the magnitudes of stars in crowded fields; and present a case study of red supergiant stars appearing within the field. Our work results in a catalog of more than 66,000 measurements of stellar positions and magnitudes in the central 68 × 68 field of view.

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