

## CONCLUDING GENERAL DISCUSSION

H.M. Maitzen: Wasn't the existence of unseen matter implied in the old Schmidt model, which needed a component of about the same mass in addition to the disk component?

M. Schmidt: I do not think there was a halo, or a round component, in that model - was there? (Laughter.) It's rather long ago - I do remember that in those models, 1956 (Bull. Astr. Inst. Netherl. 13, p. 15) and 1965 (in "Galactic Structure", Stars and Stellar Systems, Vol. V, eds. A. Blaauw and M. Schmidt, Univ. Chicago Press, p. 513), there was the problem of the density gradient in the solar neighbourhood. In my 1956 thesis I had the trouble that the high then prevalent ratio of A/B (19.5/-6.9) made the density gradient so large that clearly disk stars could not supply it. Therefore I probably talked about unknown stars or matter, but not in the present sense.

A. Blaauw: When editing our 1965 book on Galactic Structure, Schmidt and I wondered whether we should add a chapter on the evolution of the Galaxy. We thought of one person who could perhaps write something that might make sense, but we decided that the time just had not come yet.

J.P. Ostriker: In the Proceedings of the 1957 Vatican Symposium ("Stellar Populations", ed. D.J.K. O'Connell S.J., Amsterdam: North Holland/New York: Interscience, 1958; also Specola Astr. Vaticana Ricerche Astron. Vol. 5) there was a section which summarized thoughts at that time about galactic evolution.

Blaauw: In "Galactic Structure" I wrote a chapter on Stellar Populations, which summarized definitions and introduced tables about ages and metallicity etc. - but it did not go beyond that; it did not conclude to evolutionary scenarios.

R.H. Sanders: Another historical point. In the book on "Galactic Structure" the Galactic Centre was mentioned in the final chapter by Woltjer, who discussed the 3-kpc arm discovered in 1956 by Hugo van Woerden (and others: H. van Woerden, G.W. Rougoor and J.H. Oort, Comptes-rendus Acad. Sci. Paris 244, 1691). Woltjer suggested that its radial motion might be due to an explosion, and estimated that the explosion energy would have to be of order  $10^{58}$  erg. Some years later Prendergast and I did a numerical calculation; we found after a lot of computing that it took  $10^{58}$  erg to produce the 3-kpc arm. Now I think most of us believe what Frank Kerr first suggested (in I.A.U. Symposium 31, "Radio Astronomy and the Galactic System", ed. H. van Woerden, London: Academic Press, p. 239): that the 3-kpc arm has a more natural explanation by non-circular motions in the potential of a broad oval distortion or something like that --- (Ostriker: You would not want to say: a bar?) --- a bar, O.K., but it is interesting that, because of the unique point source and the remarkable infra-red and radio-continuum structure at the Galactic Centre, we are now coming back to thinking that there might be something unconventional going on there, though on a much smaller scale.