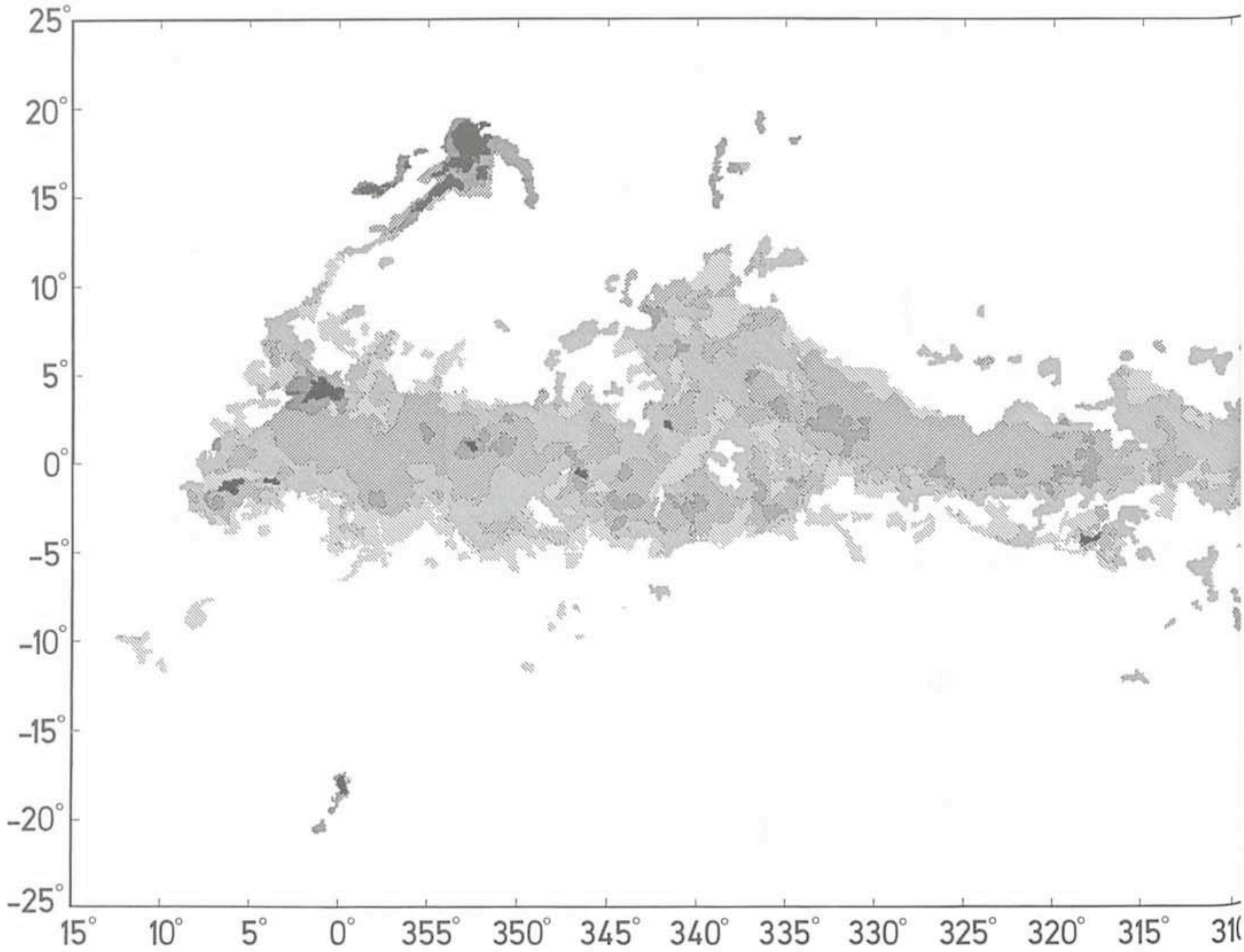

Fig. 1: *The distribution of dark clouds (> 0.01 deg²) in galactic coordinates. This map exists in a machine readable, digitized form as a 500 × 1,400 pix*

A Catalogue of Dark Nebulae for the Southern Hemisphere

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A catalogue of dark nebulae and globules has been compiled from a study of the ESO (B) and SRC J Sky Atlas for galactic longitudes $240° < l < 360°$. This catalogue closes the great southern gap open since the work of Lynds (1962) for the northern hemisphere. To secure utmost consistency and comparability between both surveys we followed as closely as possible Lynd's method in searching, determining and describing the dark nebulae.

The 606 fields of the southern atlas were examined for the presence of dark clouds; for $|b| > 30°$ no dark clouds are found, although our search extended up to $|b| = 90°$. The catalogue (with cross references) contains positions, sizes, opacities and the van den Bergh (1972) classification on the filamentary morphology of 489 dark clouds and 331 globules.

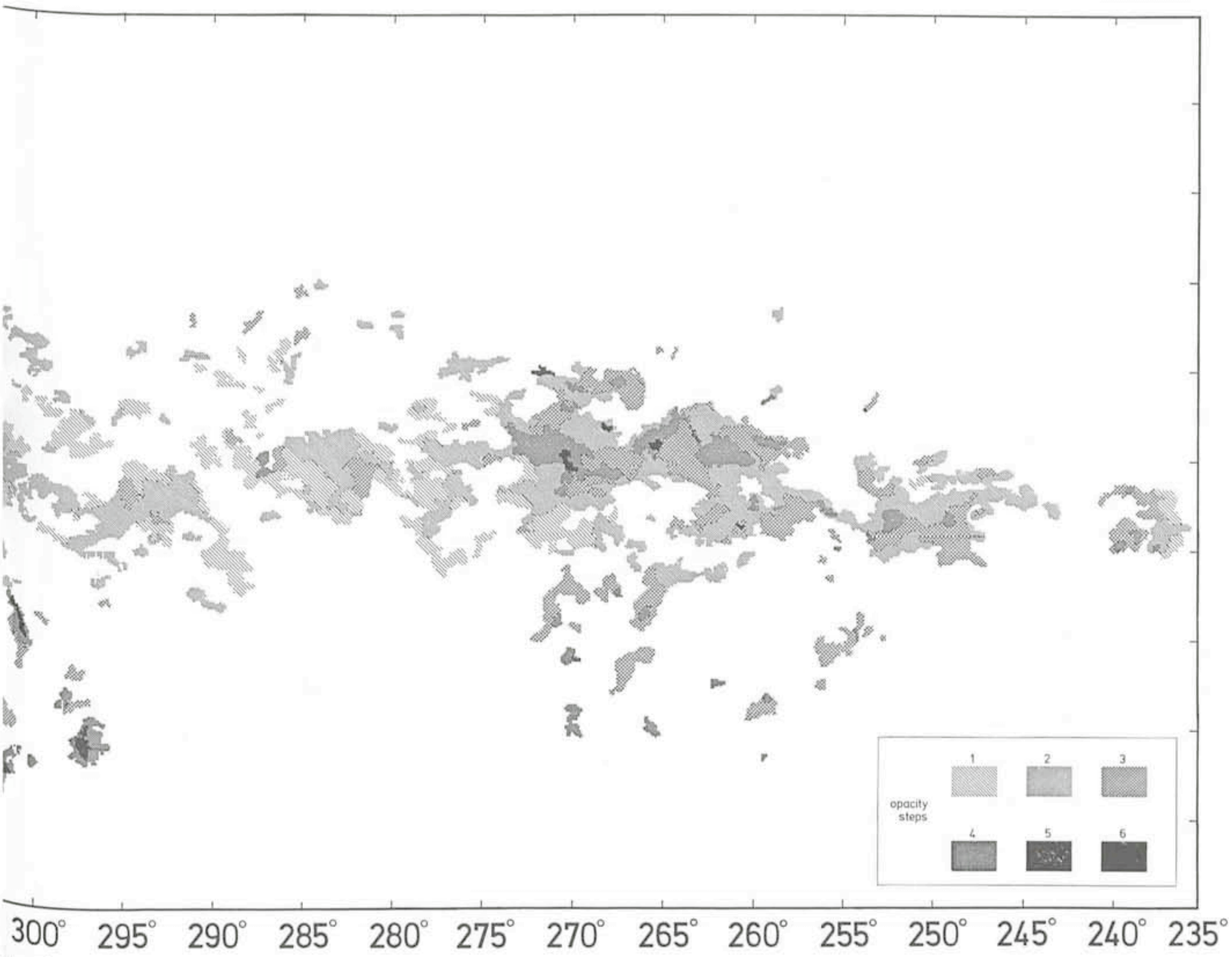
The overlapping regions between the POSS-Lynds survey and our work were used to calibrate our opacity classes. This linkage secures the equality of the opacity classes in both surveys, in spite of the different limiting magnitudes of the photographic material. Lynds used the red and blue POSS prints and recorded only clouds visible on both the red and blue photographs. She suspected that, by doing this, the more tenuous clouds, which may be transparent in the red, are not included. We have used the blue plates to obtain a greater completeness level. By comparing the clouds of the overlapping regions of the two surveys, we find that the cloud number per field is not influenced.

The percentage of the sky obscured by dark clouds is 4.98 % for the northern ($0° < l < 240°$) and 1.92 % for the southern part ($240° < l < 360°$), so the northern sky shows 2.5 times the obscuration of the southern hemisphere. The absolute numbers are (area > 0.01 deg²):

north: N = 1273 clouds, area = 1396 deg²
south: N = 437 clouds, area = 264 deg².

This reflects the well-known fact that the visible Milky Way band changes its morphological appearance from north to south.

The southern part appears more homogeneous as a consequence of the absence of the Great Northern Rift in the Milky Way. This results in fewer clouds of high opacity, which are responsible for the ruggedness. Furthermore the southern part is much brighter, also a reason for greater homogeneity.



l = 0°.1).

Besides their different opacities interstellar clouds show a bewildering variety of shapes and sizes. To take this fact into account, we supplemented the catalogue by descriptive categories: tail of a cometary globule, worm track, dark filament, etc., and the classification scheme of van Bergh (1972). The four categories: amorphous cloud (α) . . . sharp-edged absorption (δ) may be understood in terms of a simple physical picture of the evolution of interstellar clouds. These classifications should reflect the evolutionary history of the dynamical or thermal processes that once provoked the formation of the dark clouds and globules.

References

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The Chemical Enrichment of Galaxies

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Galaxies are thought to have formed out of a primordial gas consisting of ~77 % Hydrogen, ~23 % Helium and traces of Deuterium and Lithium without heavier elements. At the present time the chemical composition of the interstellar medium (ISM) in the solar neighbourhood shows a composition of ~70 % Hydrogen, ~28 % Helium and ~2 % heavier elements. This progressive enhancement of Helium and heavier elements at the expense of Hydrogen in the interstellar gas is referred to as galactic chemical evolution.

The chemical evolution of galaxies is governed by many factors such as the rate at which stars form, their mass spectrum, their evolution through successive thermonuclear cycles and the dynamics of the gas-star system. Each generation of stars contributes to the chemical enrichment of a galaxy by processing new material in the stellar interiors and restoring to the interstellar medium (ISM) a fraction of its total mass in the form of both processed and unprocessed matter, during various mass loss events (stellar winds, planetary nebula