FIRST INTEGRATED PHOTOGEOLOGICAL MAP OF THE PRECAMBRIAN DYKE SWARM OF URUGUAI: SOME GEOLOGICAL INFERENCES *

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This microgabbro dyke swarm intrudes rocks exclusively belonging to the "Ancient Orogenic Cycle", which crop out in the southwestern region of Uruguay. It is formed by a very numerous set of subparalell dykes trending from N60E to N80E, with lengths from 1 to 20 km and widths varying from 1 to 50 m, 18 m being the most frequent value. The length of the swarm is about 220 km and its width about 100 km, but lithological evidence indicates its presence under the post-Cambrian sedimentary cover. Dyke contacts are mainly vertical to subvertical and planar, indicating a rigid context at the time of intrusion. The swarm is interrupted by a N-S dextral fault which affects its eastern end. Except for this case, the dykes are undeformed, although fractured and faulted with small displacements in several zones (Figs. 1, 2).

From a compositional point of view, they are tholeiitic microgabbros, mineralogically expressed by plagioclase (labradorite) 45%, clinopyroxene (mainly pigeonite with 2 V~0°) 45%, magnetite (automorph or skeleton) 5%, micropegmatite (quartz + orthoclase or quartz + microcline) 5%.

They are subophitic and equigranular - without exceptions, with grain size varying from 0.1 mm to 1.0 mm (for the plagioclase) in direct relation to the width of the dyke. Chilled margins are verified in all cases, and the grain size is constant throughout the rest of the body of the dykes.

The age of the country rocks is about 2.0 Ga on the basis of available Rb/Sr data (UMPIERRE & HALPERN, 1971). These values were obtained on synorogenic granitoids and intrusive late tectonic bodies which belong to the last tectonothermic episode in the evolution of the system.

The dykes intrude all lithological types present in the area and do not show mineralogical transformations that might suggest more recent metamorphic events. The K/Ar (whole-rock) ages initially obtained by UMPIERRE (pers.com.) were 1.6 Ga; the most recent ones referred to by GÓMEZ RIFAS (1988) yielded ages in the range of 1.4-1.6 Ga. Otherwise, field relations indicate an age between 1.9 and 0.6 Ga as there are no dykes of this type recognized in the Upper Cambrian "Modern Orogenic Cycle".

These dykes seem to be related to a mantle dome which caused crustal thinning and rupture (CAMPAL & PIÑEYRO, 1988). This aborted rift system may be characterized as a "mantle activated rift" in accordance with the classification proposed by CONDIE (1982).

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*This work was carried out with the aid of a grant from the International Development Research Centre, Ottawa, Canada.

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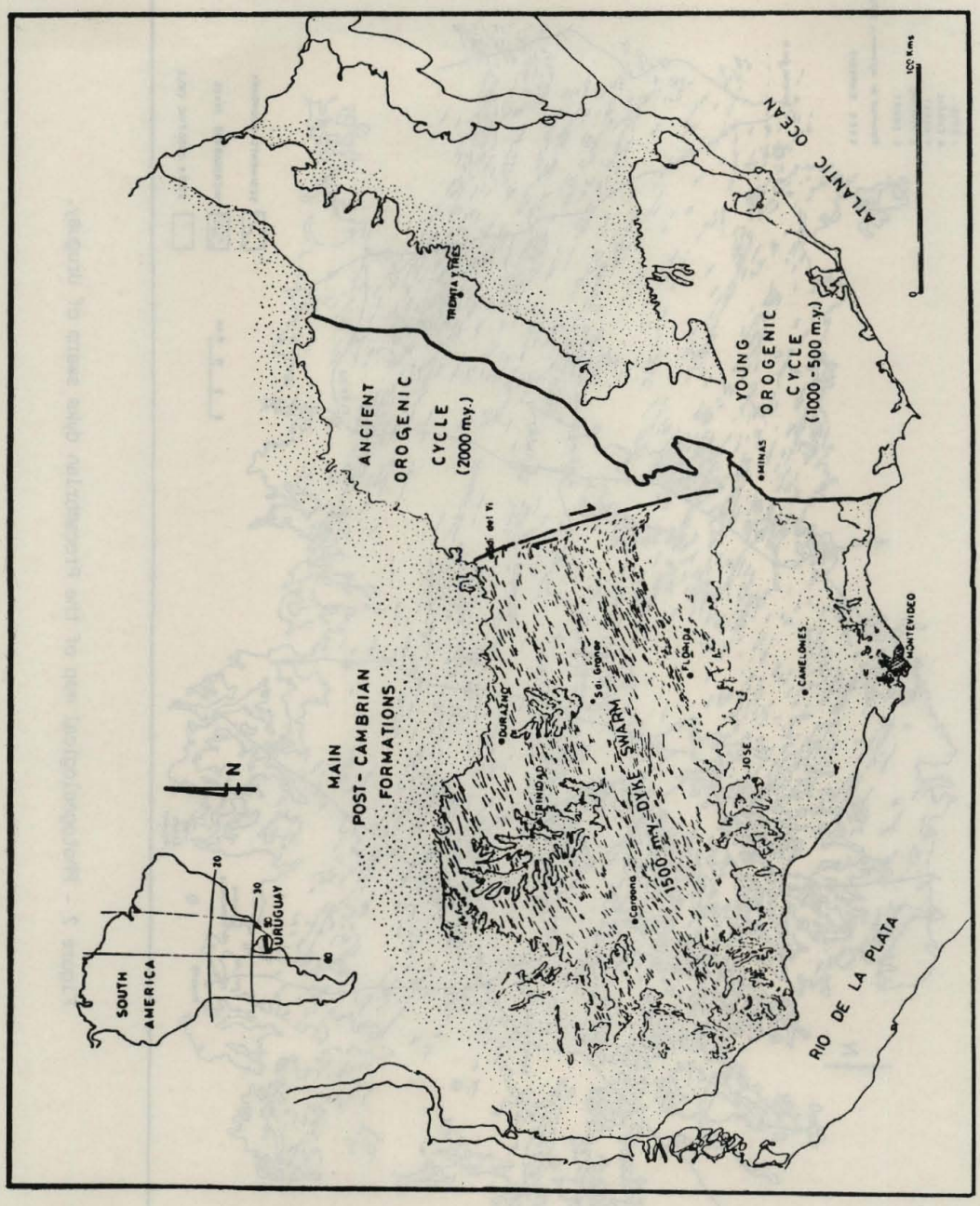

Figure 1 - Geological setting (stretch) of the Precambrian dyke swarm of Uruguay.

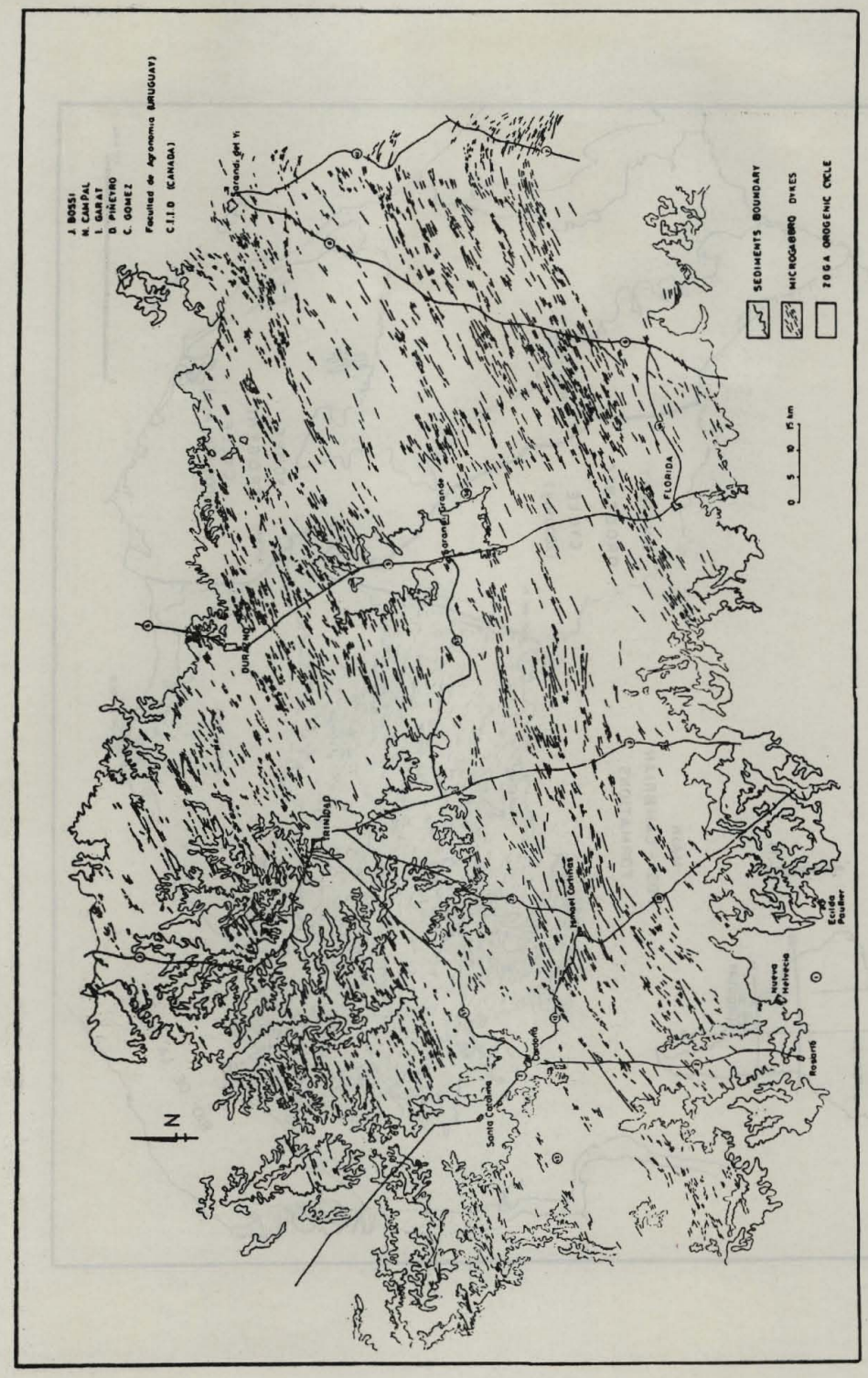

Figure 2 - Photogeological map of the Precambrian dyke swarm of Uruguay.