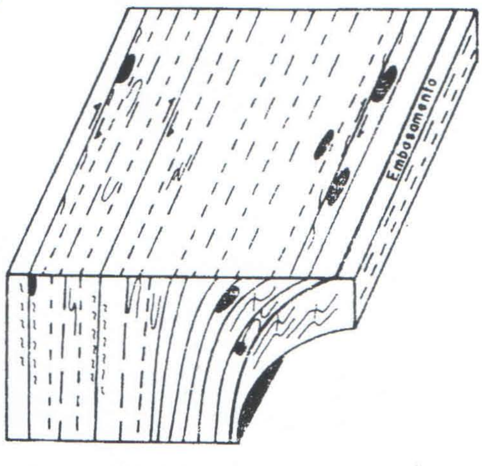

Figura 2 - Esboço tectônico da Faixa Orós, onde ressalta-se uma estruturação em leque assimétrico ("semi-leque").

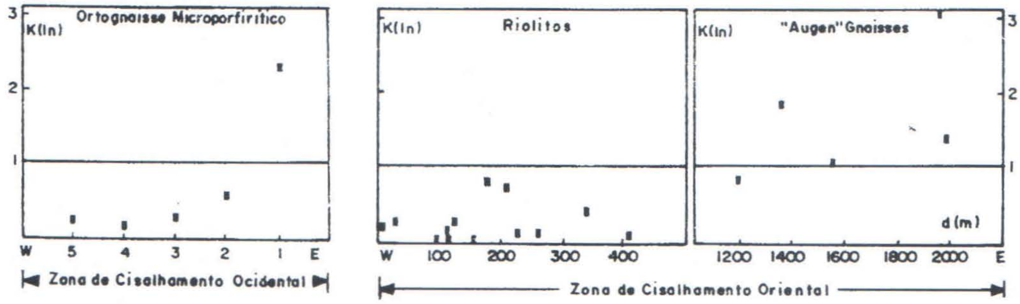

Figura 3 - Diagramas binários dos parâmetros K(ln) de Ramasay (1967) *vs* localização das amostras nas zonas de cisalhamento da faixa Orós. A linha horizontal K(ln)= 1 separa os domínios do achatamento (K<1) e constrição (K>1)

THE BORBOREMA SHEAR ZONE SYSTEM: A TECTONIC MODEL

A. Vauchez - Univ. de Montpellier II, France; **V. Amaro** - UFRN, Natal, Brasil; **C. Archanjo** - UFRN, Natal, Brasil / Univ. de Toulouse, France; **M. Arthaud** - Univ. Fortaleza, Brasil; **J.L. Bouchez** - Univ. de Toulouse, France; **R. Caby** - Univ. de Montpellier II, France; **M. Corsini** - Univ. de Nice, France; **M. Egydio-Silva** - USP, São Paulo, Brasil; **E.F. Jardim de Sá** - UFRN, Natal, Brasil; **S.P. Neves** - UFPe, Recife, Brasil; **J.M. Sá** - UFRN, Natal, Brasil; **A.N. Sial** - UFPe, Recife, Brasil.

During Neoproterozoic time, the Borborema province was entirely affected by the Brasiliano orogeny that resulted in the development of a complex network of continental-scale transcurrent shear zones, over an area exceeding 200,000 km^2. This network (fig. 1), one of the largest and most complex in the world, is composed of notheast-trending dextral strike-slip faults in the northwestern domain, and by east trending dextral strike-slip faults associated with north to northeast-trending metasedimentary belts in the central and southeastern domains. Combining remote sensing, kinematic analysis and $^{40}Ar/^{39}Ar$ dating of rocks from the shear zones, it is suggested that the entire network forms a mechanically coherent system the Borborema Shear Zone System - resulting from a single, long lasting tectonic event.

Satellite imagery together with field data stress the extension and geometry of individual shear zones and the relationships between the different structures forming the system (*e.g.* Amaro *et al.*, 1991), especially:

- The main fault zones are well defined and wide (from 5 km up to 25 km),
- NE-trending shear zones in Ceará (Granja sz, Senador-Pompeu sz) are rectilinear and continuous. On the opposite EW-trending shear zones of central Borborema (Patos sz, Campina Grande sz, Pernambuco sz) are discontinuous, composed of separate segments that terminate at the tip of NE-trending transpression belts to which they are linked in structural continuity,

- Westward, the Patos shear zone ends into a shear zone duplex to which are also connected the Orós system and the Portalegre shear zone.

Detailed petrofabric studies (*e.g.* Jardim de Sá *et al.*, 1988; Archanjo & Bouchez, 1991; Caby & Arthaud, 1990; Corsini *et al.*, 1991; Sá *et al.*, 1991; Vauchez & Egydio-Silva, *in press*) suggest that:

- The main activity of the Borborema system is coeval with low pressure-high temperature metamorphism and crustal melting; at this stage, both NE- and EW-trerding shear zones display evidence of a dextral shear sense;
- N- to NE-trending branches display evidence of transpression, whereas EW-trending shear zones are infilled by syntectonic magmas, what is more suggestive of transtension;
- NE-trending shear zones of Ceará have retained relicts of an early, higher pressure mylonitisation suggesting strike-slip faulting was associated with crustal thickening;
- The entire system has been subsequently reactivated under decreasing temperature conditions; at this stage, the strike-slip faults of the central domain form a Riedel system of EW-trending dextral faults and NE-trending sinistral faults.

Preliminary $^{40}Ar/^{39}Ar$ dating (Figueiredo *et al.*, 1992) supports a broadly synchronous deformation in the different branches of the system, and a low cooling rate. However the high-pressure shearing event yields a significantly older $^{40}Ar/^{39}Ar$ age that may be due either to an earlier deformation or to a higher cooling rate.

From these data a tectonic model is derived. It considers that the driving force results from an oblique collision at the northwestern margin. The systeme was develop in a hot and *highly* deformable crust. The NE-trending shear zones of Ceará would represent typical trench-linked strike-slip faults developed along a transpressional margin.

The EW-trending movement zones splay-off from the main NE-trending shear zones; their initiation would be due to a conjugate effect of a contrast of rheology at the northern boundary of the São Francisco craton and of the existence of NE-trending basins developed during the upper Paleoproterozoic (Sá *et al.*, 1991) and the upper Mesoproterozoic (Brito Neves *et al.*, 1990) that may have acted as zones of easier deformation.

REFERENCES

AMARO, V.; E.F. JARDIM DE SÁ & A. VAUCHEZ, 1991. Foto-análise preliminar dos lineamentos brasilianos da porção central da província Borborema. Simp. Geol. Nordeste, 14, Recife, *Atas*: 306-309.

ARCHANJO, C.J. & J.L. BOUCHEZ. 1991. Le Seridó, une chaîne transpressive dextre au Protérozoïque supérieur du Nord-Est du Brésil. *Bull. Soc. Géol. Fr.*, 162: 637-647.

BRITO NEVES, B.B.; W.R. VAN SCHMUS & M.A.S. BASEI, 1990. Contribuição ao estudo da evolução geochronológica do sistema de dobramentos Piancó-Alto Brigida. In: CONGR. BRAS. GEOL., 36, Natal, *Anais*, v. 6: 2697-2710.

CABY, R. & M. ARTHAUD. 1990. Compared petroestructural evolution of Archean and Proterozoic units suggestive of monocyclic, Brasiliano age tectono-thermal evolution in Ceará. In: CONGR. BRAS. GEOL., 36 , Natal, *Resumos*, p. 301.

CORSINI, M.; A. VAUCHEZ; C.J. ARCHANJO & E.F. JARDIM DE SÁ. 1991. Strain transfer at a continental scale from a transcurrent shear zone to a transpressional fold belt: The Patos-Seridó belt system, (NE Brazil). *Geology*, 19: 586-589.

FIGUEIREDO, L.L.; P. MONIE; G. FERRAUD; R. CABY; M. CORSINI; M. ARTHAUD & A. VAUCHEZ. 1992. Durée des événements tectono-métamorphiques dans les chaîne protérozoïques: premiers résultats $^{40}Ar/^{39}Ar$ sur le NE du Brésil. Réun. Sci. Terre, 14, Toulouse, France: Soc. Géol. Fr., *Résumé*: p. 63.

JARDIM DE SÁ; E.F.; M.H.F. MACEDO; H.H. FALCÃO TORRES & K. KAWASHITA. 1988. Geochronology of metaplutonics and the evolution of supracrustal belts in the Borborema Province, NE Brazil. Congr. Latino-Americano Geol., Belém, Brasil, *Anais*, v. 1: 49-62.

SÁ, J.M.; J. LETERRIER & J.M. BERTRAND. 1991. Évolution géodynamique et géochronologique (U-Pb, Rb-Sr et K-Ar) de la ceinture plissée d'Orós, NE du Brésil. *C.R. Acad. Sc. Paris*, 313: 231-237.

VAUCHEZ, A. & M. EGYDIO DA SILVA in press. Termination of a continental-scale strike-slip fault in partially melted crust. The west Pernambuco shear zone (NE Brazil). *Geology*.

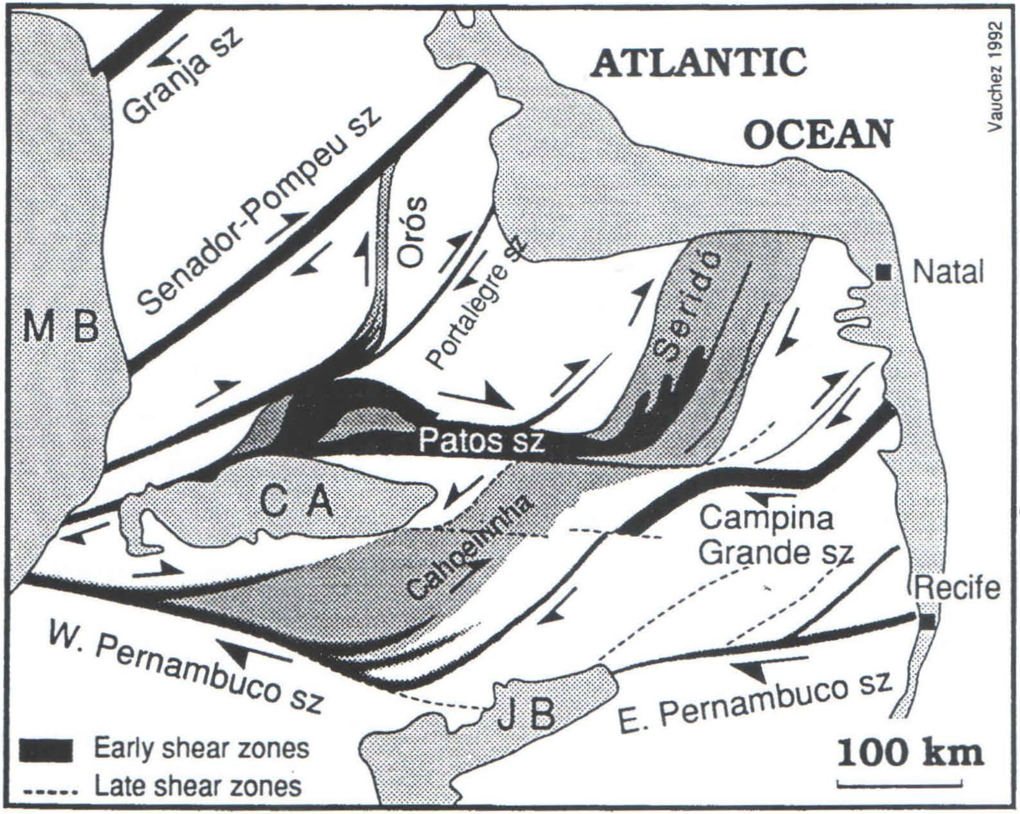

Figure 1: The Borborema Shear Zone System