a 1:10,000 scale, each made up of several similar facies, are the following: 1) dark-grey, fine-grained monzodiorites (Mdf); 2) medium-coarse grained monzodiorites (Mdc), which locally show either abrupt or transitional contacts with Mdf; 3) more leucocratic monzodiorites to monzonites (Mle), invading both Mdf and Mdc; 4) still later, grey monzonites (Mgr) and light-colored quartz monzonites (Qmle). The two last types are observed mainly as marginal facies.

Mgr show sparse plagioclase and microcline megacrysts, with greenish-brown biotites (partly derived from green hornblende); accessory minerals are allanite, sphene, apatite, zircon, magnetite and ilmenite. Qmle facies (locally, quartz syenites) are light pink rocks, with megacrysts of microcline, in a quartz-feldspar matrix with aggregates of green biotite and green hornblende; green hornblende is missing in more leucocratic varieties. Accessory minerals are as mentioned for Mgr. In contrast, older facies of the Mdf, Mdc and Mle associations are more plagioclase-rich and show brown biotite and Ca-pyroxene.

Mgr varieties are somewhat earlier than Qmle, although parallel flow structures observed in some areas of mutual contact suggest overall contemporaneity. Structurally, the two late facies invade older rocks of the Mdf and Mdc facies, permeating them as irregular veins and sheets; the overall aspect of these "mixed" rocks, which often appear as wide bands (up to several hundred m in thickness) is that of a "migmatite", with elongated (plastically deformed?) ellipsoids of the older rocks separated by varied amounts of the "neosomatic" Mgr and Qmle.

The late facies are clearly intrusive within basement rocks (Mgr shows xenoliths of orthogneiss attributed to the Socorro Complex, while Qmle invades early-Brasiliano basement migmatites).

Older facies (Mdf, Mdc and Mle) show several features, at a mesoscopic scale, interpreted as the result of selective mobilization (nebulitic structures; millimetric leucocratic, feldspar-rich, syenitic ocelli, locally so abundant as to define a "spotted" mixed facies; etc); some mobilizates are also observed as cm- to dm-sized bands, showing, composition and texture similar to those found in Mgr and Qmle.

Based on the discussed textural, petrographic and geologic features, Mgr and Qmle can be interpreted as mobilized material collected by segregation, probably generated during partial fusion of the Piracaia massif. Differences in composition of the mobilizates can be attributed to variation in the degree of partial fusion and/or differences in composition of the melting Piracaia protolith. — (*12 de novembro de 1985*).

THERMAL AND EMPLACEMENT HISTORY OF THE SOUTHERN EQUIGRANULAR GRANITOIDS OF THE MORUNGABA MASSIF, EASTERN STATE OF SÃO PAULO* — SILVIO R. F. VLACH AND HORSTPETER H. G. J. ULBRICH, presented by A. C. ROCHA-CAMPOS — *Instituto de Geociências, Universidade de São Paulo, São Paulo, SP* — The Morungaba granitoid massif, in eastern State of São Paulo, southern Brazil, is composed mainly of late, mostly equigranular and earlier porphyritic granites (3a and 3b) and quartz (qtz) monzonites, with subordinate amounts of melagranites, granodiorites (grd), qzt diorites and porphyries intrusive into ortho- and paragneisses. The equigranular varieties crop out mainly in the southern and NE part of the massif, covering about 130 km^2.

Over thirty equigranular facies were identified, grouped as follows (field terminology): melagranitoids (qtz diorites to grd and 3b granites) usually with biotite (bi), hornblende and sphene (sph); grey facies (grd and 3b granites), with bi ± muscovite (mu) ± garnet (gar) ± sph ± magnetite (mt) ± ilmenite (il), where sph is incompatible with the pair gar-primary (?) mu; "two feldspar" (2F) facies (white plagioclase and pink microcline), mainly qtz monzonites and 3a-3b granites, with bi ± sph ± mt ± il; pink and white facies (3b granites) with bi ± mu ± mt ± il; granitoid porphyries (qtz and feldspar phenocrysts in a fine-grained, sometimes granophyric matrix). All facies groups, with exception of the pink and white varieties, may appear either with massive or oriented textures.

Field observations show a "more mafic" to "more felsic" emplacement sequence, as follows (older to younger): most melagranitoids (actually, recrystallized basement rocks) — most grey facies — "2F" types — pink and white facies — late porphyries; within each facies group, a similar age pattern is also observed (e.g., more mafic grey facies preceding later more felsic varieties).

In the southern part of the massif, facies groups are arranged according to a zoned, roughly concentric, pattern. Inequigranular early "2F" types crop out as an elongated N-S body within a subcircular structure, constituted by pink and white facies which, in turn, are surrounded almost completely by felsic "2F" granitoids, followed on the outside again by pink and white types (at the SW and NW borders) and by more mafic "two feldspar" varieties. Grey types and melagranitoids are found mainly along the eastern border of this structure, as lenticular to irregular bodies. Granite porphyries are observed as minor lenticular outcrops within pink varieties, and as late dikes, cutting both granitic and basement rocks.

Concentric petrographic zoning, coupled with textural and structural features, suggest an emplacement sequence, in the southern part, controlled by thermal and/or uplift history. Earlier "2F" granitoids, located both as an inner central lens and as border facies, show oriented textures and were emplaced under more "forceful" conditions, into hotter and weaker country rocks, than the latter pink and white varieties; granite porphyries invaded already cool country rocks.

Differences in depth of emplacement between earliest and latest magma invasions may not be too significant. All magmas invaded probably at medium "mesozone" depths; the subvolcanic textural aspects of porphyries are mimicked

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more by emplacement conditions into cool and brittle rocks, than by very shallow depths. — *(12 de novembro de 1985).*

K-FELDSPARS FROM THE POÇOS DE CALDAS NEPHELINE SYENITES, SOUTHERN BRAZIL: CHEMICAL, OPTICAL AND XRD STUDIES* — MABEL NORMA COSTAS ULBRICH, presented by A. C. ROCHA-CAMPOS — *DMP-IG-USP, São Paulo SP* — Potash feldspars (KF) comprise 40-60% of both miaskitic and agpaitic nepheline syenites (NeS) of the Poços de Caldas alkaline massif (M. Ulbrich *et al., An. 33° Congr. Bras. Geol.*, 4362-4376). In most rocks, KF (Or 80-100) are homogeneous or weakly zoned. However, early miaskitic facies of the so-called "Pedreira NeS" present Sr-rich (1,2% Sr) KF with higher Na, Ca and Ba contents. Fine-grained NeS of the Pedreira type show zoned KF ranging from $Or_{54}Ab_{40}An_6$ (cores) to $Or_{85}Ab_{14}An_1$ (borders), while coarse to medium-grained varieties show zoning from $Or_{71}Ab_{28}An_1$ (cores) to $Or_{82.2}Ab_{17}An_{0.8}$ (borders); the An molecule in the above formulae includes both Ca and Sr.

In some border facies, late albite (metasomatic, Ab 98-100) is found enclosed within KF, together with locally conspicuous microperthites of the string or rod varieties, sometimes as veins or patches.

KF structural state is variable. In most NeS, orthoclase coexists with highly-ordered microcline, either within single grains or in different crystals or the same sample. Orthoclase shows $2V_\alpha \sim 23\text{-}55°$, equivalent to $2t_1 = 0.69\text{-}0.82$ (Stewart & Ribbe, 1983, *Rev. Mineral.*, II, 2nd. ed., 121-139). Some microcline grains show $2V_\alpha \sim 60\text{-}65°$, corresponding to $t_1o + t_1m = 0.84\text{-}0{,}87$ (equivalent values from X-ray patterns are 0.93; Kroll & Ribbe, 1983, *Rev. Mineral.*, II, 2nd. ed., 57-99). In the Pedreira NeS, orthoclase is the only KF observed in the fine-grained rocks, while in the coarser varieties, it coexists with intermediate microcline ($2V_\alpha = 54\text{-}56°$ in the cores and 44-46° at the borders, with unresolved 131 and 131 X-ray peaks). Maximum microcline is found as the only KF in some agpaitic and miaskitic facies ($2V_\alpha \sim 76\text{-}84°$; $t_1o + t_1m = 0.93\text{-}0.99$).

Microcline twinning, different from the normal cross-hatched pattern, resembles either "chess-board albite" (incipient, thin twin lamellae) or well-developed "tiled microcline twinning" (cf. Smith e McLaren, 1983, *Phys. Chem. Minerals*, **10**, 69-76).

Ordering of Or-rich KF, as suggested by crystals partially converted into microcline, proceeds by rapid growth of pre-existing highly-ordered triclinic domains spreading throughout the grain. The process, which leads directly from orthoclase to almost maximum microcline, is probably enhanced by the peralkaline character of the parental magmas and the cooling history of the rocks. Similarly, perthite coarsening is directly related to activity of Na-rich residual solutions, which also form metasomatic late tabular albite.

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Nepheline-KF geothermometry (M. Ulbrich, 1985, *An. Acad. brasil. Ciênc.*, **57**, 131) shows a geothermometric T of 500-600°C in rocks with coexisting orthoclase and microcline, while rocks with only maximum microcline present submagmatic re-equilibration T of less than 500°C. Highest T(730-800°C) are found in the fine-grained orthoclase-bearing miaskitic Pedreira types. Medium coarse-grained Pedreira varieties exhibit coexistence of orthoclase and intermediate microcline, with a geothermometric T of 500-600°C. A different ordering process is here at work, probably influenced by kinetic factors due to unknown structural controls (KF are richer in Na, Sr, Ca and Ba). — *(12 de novembro de 1985).*

POPULAÇÕES MARGINAIS E O PROBLEMA DE ABASTECIMENTO DE ÁGUA* — URIEL DUARTE E MARIO SIROU KANEHISA, credenciados por A. C. ROCHA-CAMPOS — *Centro de Pesquisas de Águas Subterrâneas, Instituto de Geociências, Universidade de São Paulo, São Paulo, SP* — Aceita-se universalmente que o abastecimento adequado de água potável, para higiene pessoal e outros fins domésticos, e a existência de um meio adequado de disposição dos dejetos, são essenciais à saúde pública e ao bem-estar humano. Infelizmente, um vasto número de pessoas nos países em desenvolvimento, grande parte delas residentes em áreas periféricas às cidades e na zona rural, não têm acesso a uma fonte higiênica e conveniente de água e quando o têm não dispõem normalmente de equipamentos satisfatórios para a disposição dos dejetos.

Esta circunstância é agravada pelo fato de o atendimento das necessidades das populações e comunidades, notadamente no que tange aos serviços sociais básicos, depender do desempenho das economias nacionais.

As diferentes formas de captações de água disponíveis para os habitantes das periferias urbanas e zonas rurais, que correspondem a cerca de 40% da população brasileira, são os poços tipos cacimba, ponteira e as nascentes, fontes ou bicas. O esgotamento das águas residuais é feito através de fossa negra ou poços de infiltração ou, ainda, através do escoamento superficial, em locais onde o lençol freático é aflorante, impossibilitando esta infiltração.

A localização de captações, em função do sistema de disposição de esgoto, de acordo com as regras sanitárias, não é obedecida por esta parte da população brasileira, quer por ignorância do problema, quer por problemas decorridos do tipo de loteamento, dimensões dos terrenos individuais, comuns nas periferias das grandes cidades e, ainda, pela inexistência de recursos para o transporte dos líquidos.

O conjunto de circunstâncias acima resulta na poluição dos mananciais captados e conseqüente ocorrência de endemias, doenças de veiculação hídrica, etc., que normalmente atingem as populações, provocadas pela ingestão de águas contaminadas.

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