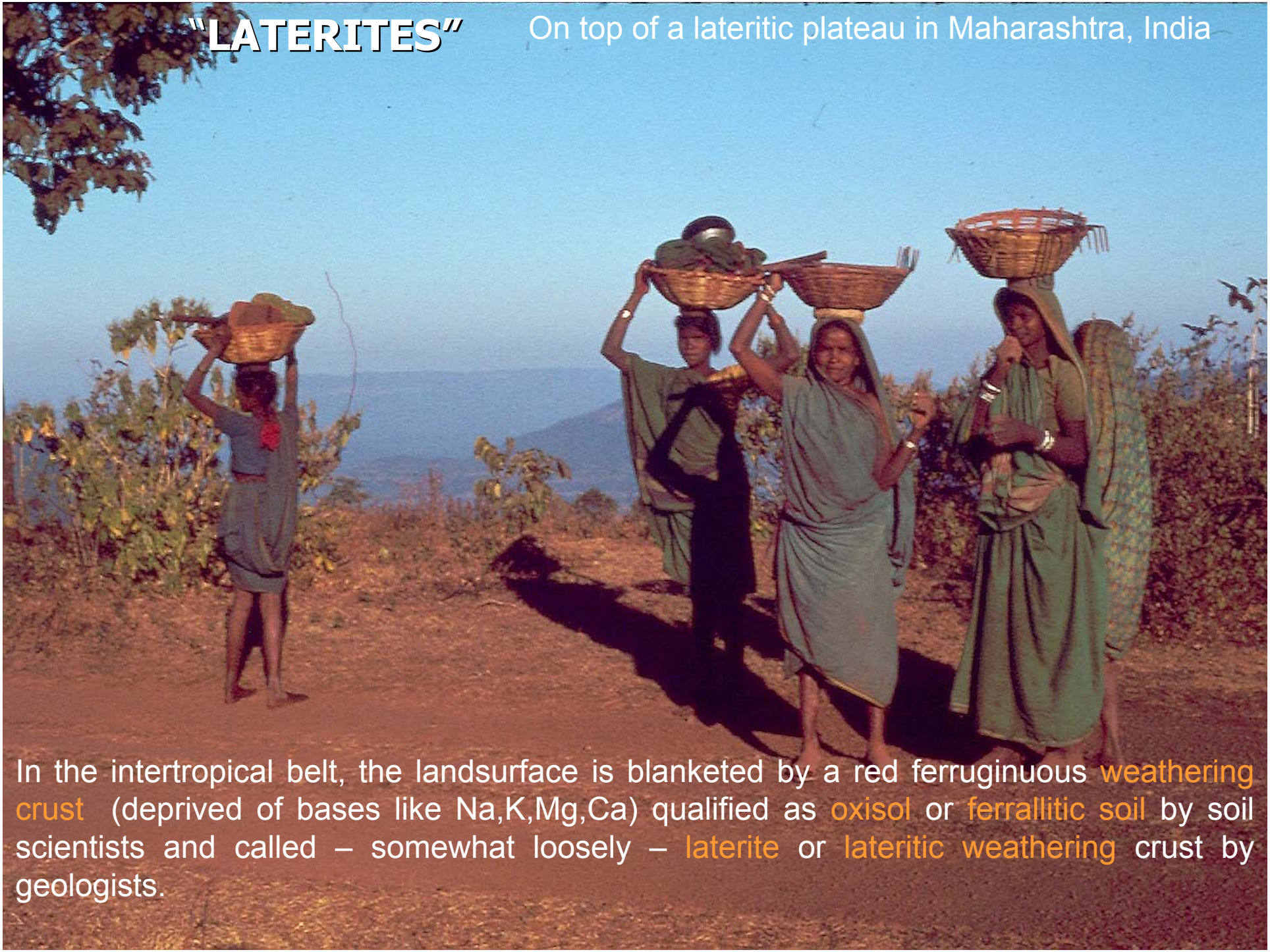
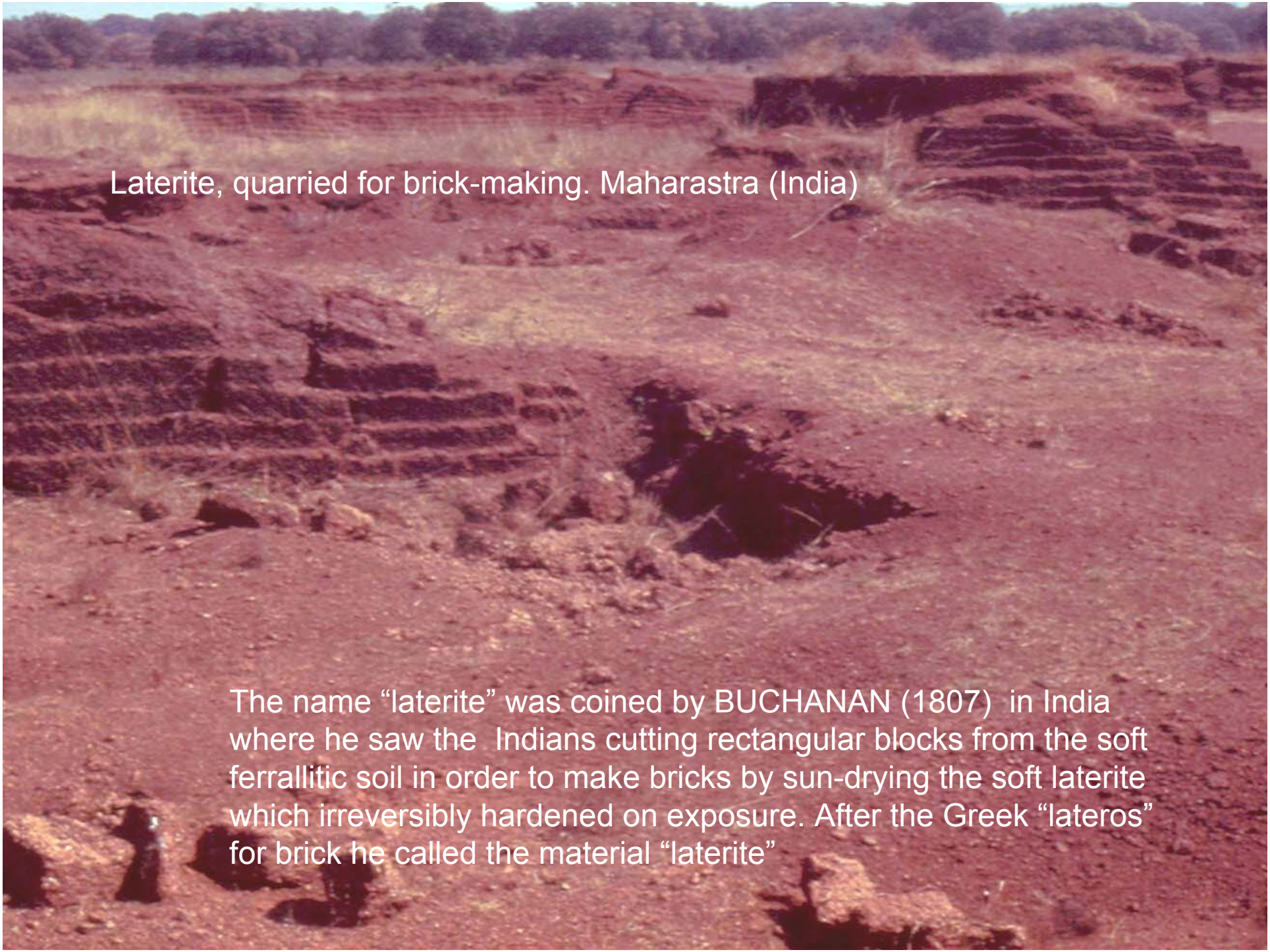
"LATERITES"

On top of a lateritic plateau in Maharashtra, India



In the intertropical belt, the landsurface is blanketed by a red ferruginuous weathering crust (deprived of bases like Na,K,Mg,Ca) qualified as oxisol or ferrallitic soil by soil scientists and called – somewhat loosely – laterite or lateritic weathering crust by geologists.


Laterite, quarried for brick-making. Maharastra (India)
The name “laterite” was coined by BUCHANAN (1807) in India where he saw the Indians cutting rectangular blocks from the soft ferrallitic soil in order to make bricks by sun-drying the soft laterite which irreversibly hardened on exposure. After the Greek “lateros” for brick he called the material “laterite”

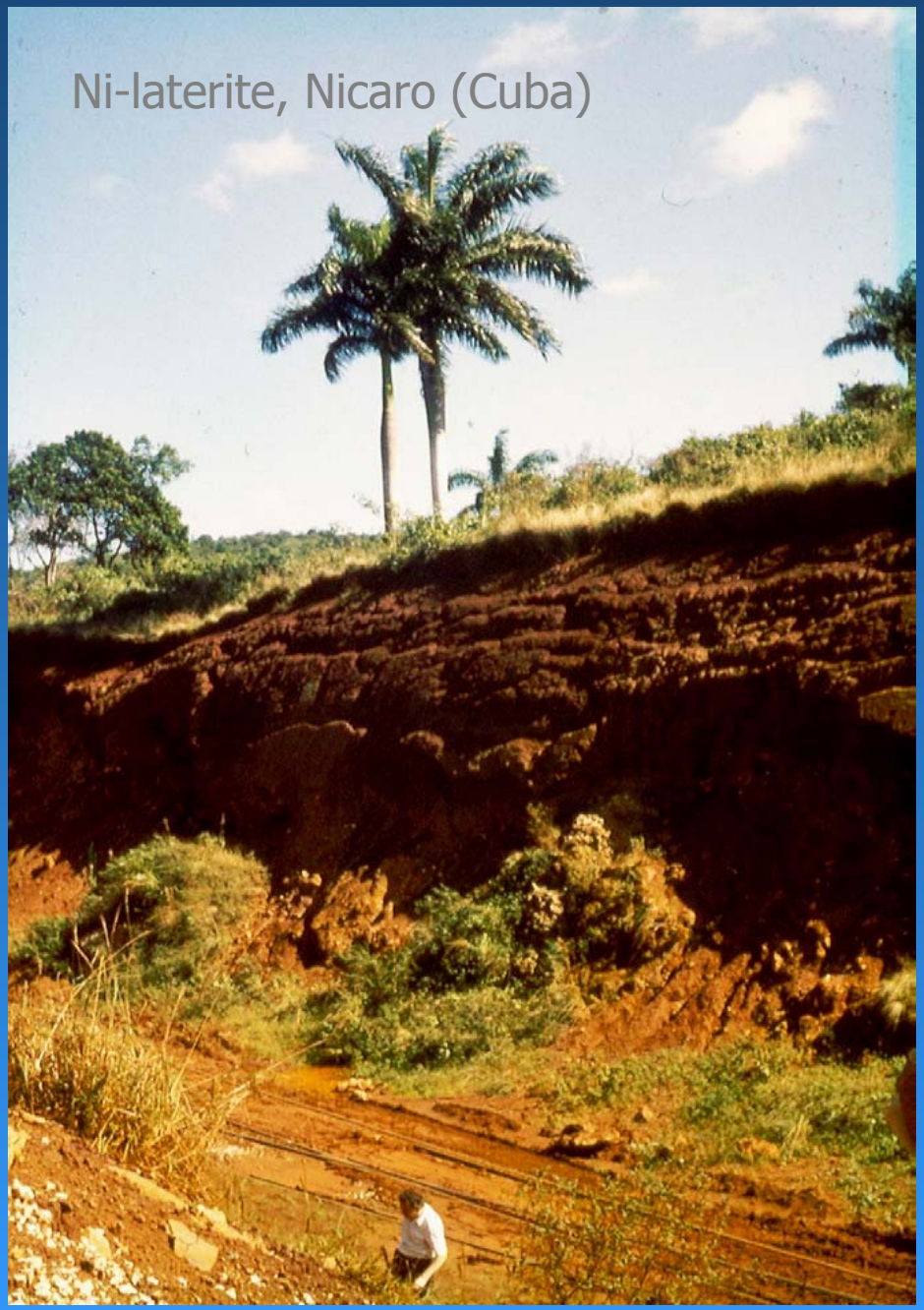
buildings made of sun-dried blocks of

close-up of a "brick"

the new wall

drying "bricks"

The use of laterite as construction material (In



At places of optimum leaching the thickness of the lateritic weathering crust may exceed 100 meters

Depending on parent rock chemistry, the weathering crust may become relatively enriched in Fe, Al, Mn or Ni even up to economic concentrations

Experience shows that Ni-laterites are associated with ultramafic rocks, Fe-laterites with mafics while Al-laterites (bauxites) may develop on various kinds of igneous metamorphic and even sedimentary rocks. Laterites with economic concentrations of Mn are mainly associated with sedimentary or metamorphic already primarily rich in Mn

Anatomy of a lateritic weathering profile

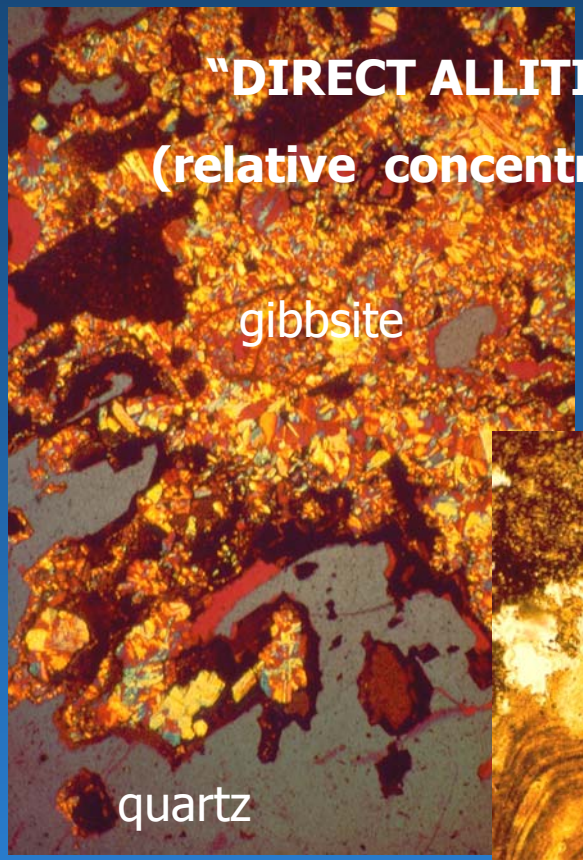
The degree of mechanical desintegration is increasing upwards

Specific surface increased on desintegration results in increased interaction with infiltrating rain-water nd therefore increased leaching → degree of alteration is likewise increased towards the top

Leaching is optimum on top, where the material consists essentially of Fe- and Al oxides and hydroxides

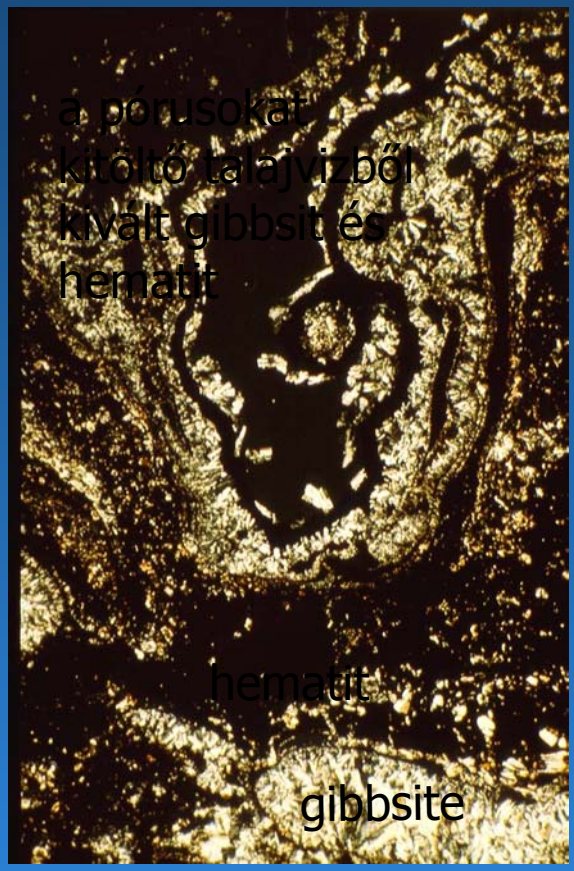
"DIRECT ALLITIZATION"

(relative concentration of Al)



"INDIRECT ALLITIZATION"

(textural reorganization)



Fe- and Al rich pore-space filling

(absolute concentration of Al and Fe)