GEOCHEMISTRY OF TERMITARIA AND SOILS COVERING FERRICRETE: APPLICATION TO GOLD EXPLORATION IN WESTERN AFRICA.

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In West Africa termites are very common and some recent studies indicate that they play an important role in the remobilization of the lateritic weathering profiles. Their mound-building activity results in an upward transfer of clay, silts and fine sand particles to the ground surface. On plateaus, the main source of fine materials is located at several meters depth below the ferricrete and corresponds mainly to the mottle zone or to the top of the lithomarge. Termite mounds are subsequently eroded, their material is washed out during the rainy season, transported downslope and deposited in low-lying areas of the landscape. This process of mechanical dispersion and formation of silty-clay soil cover was evidenced in the lateritic landscape of the Kangaba area (South-Mali) after comparative studies of different sampling media.

This dispersion model in lateritic environment is further investigated in the vicinity of a primary gold mineralization in order to better assess the representativity of termite mound composition and its use as an alternative sampling media for geochemical exploration of lateritic covers.

Termitaria were sampled over an area of 1 km^2, with a regular density of 100×50m corresponding to the sampling grid of a previous geochemical survey of ferricretes and soils.

Two kinds of termite mounds are easily distinguished in this area:

- large conical-shape mounds (height>1 m) with thick walls, called cathedral mounds, more frequent in wooded areas, belong to *Macrotermes*;
- mushroom-shape mounds, more common and widespread, are attributed to *Cubitermes*.

Greater amounts of organic matter is stored as twigs and straw fragments in the alveoar cells of *Cubitermes* termitaria. This is characterized by LOI excess after normative calculation of mineralogic composition and also by higher contents of P.

Morphology is an important differentiation factor: termite mounds sampled on the top level of the plateau are richer in kaolinite (55%) and iron (10%) and poorer in quartz (35%) than mounds collected on silty-soil cover in lower flat areas (kaolinite=20%, iron=3%, quartz=75%). Therefore a composition gradient related to altitude and morphology is clearly visible on geochemical maps with a gradual transition along the glacis slope. Many trace elements are associated with kaolinite and goethite (K, Ba, Cr, V, As, Cu, P, Sr, Zn, Mn) and vary in opposition with quartz and Zr. Some other elements (Ti, Co, Y, Nb, Ce) are more independent of the dilution effect by quartz and are enriched in the north-eastern part of the area along a stream incision of the ferricrete. This latter association probably represents another mineral phase such as biotite or chlorite.

The mineralized ore-body on the plateau is well delineated by Au and As anomalous contents and is better characterized than in ferricrete sampling by other indicators elements (B, K, Ba, Sr, Cd, Pb, Cu). The dispersion halo of gold is more widespread and more contrasted in termitaria than in ferricrete with less erratic values corresponding to a diminution of the 'nugget effect'.

Termite mound composition conveys a strong expression of the gold bedrock mineralization upwards to the ground surface, but this geochemical signal is also probably enhanced by old mining works contributing to mechanical dispersion of surficial materials in this area.

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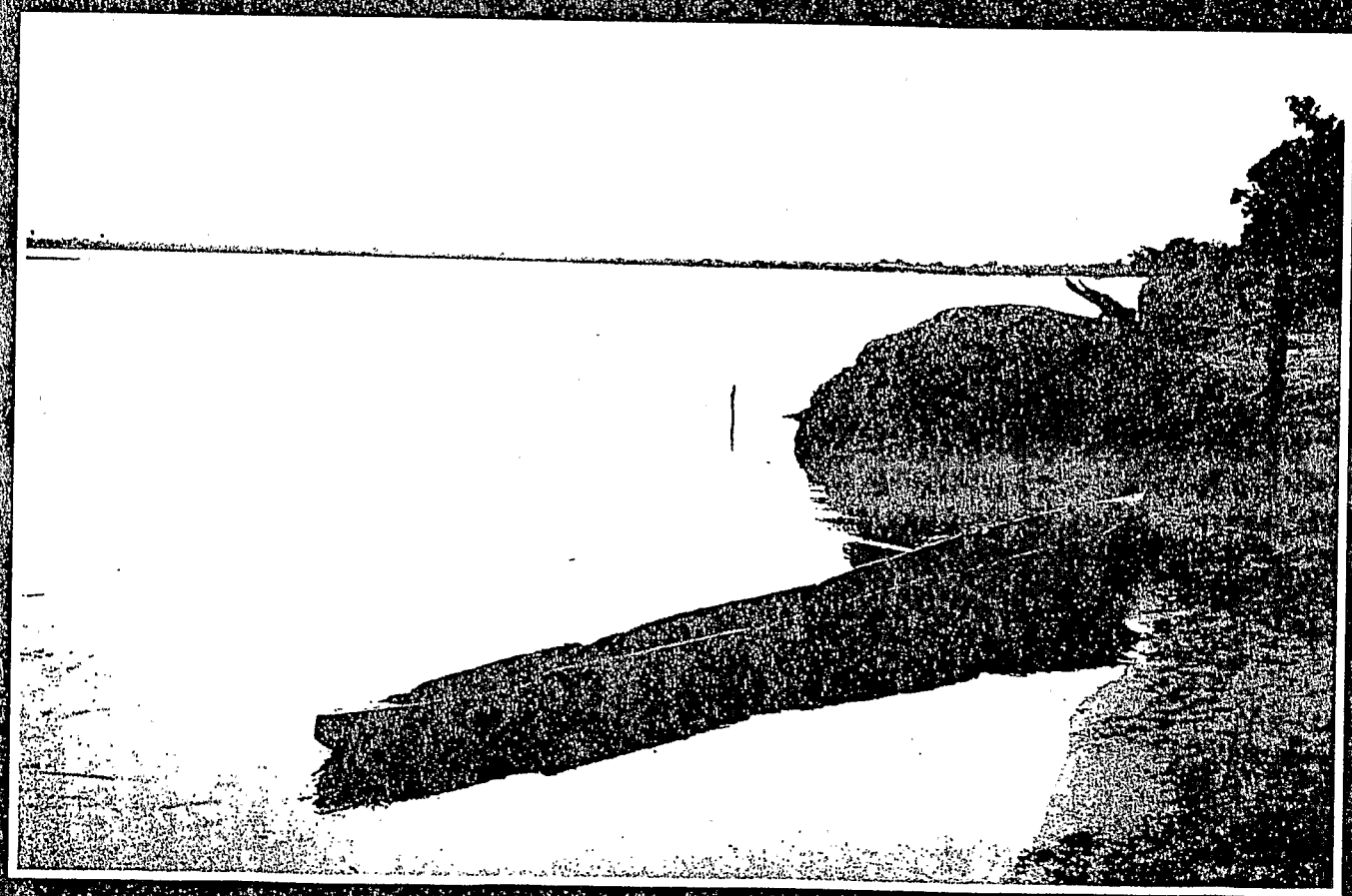

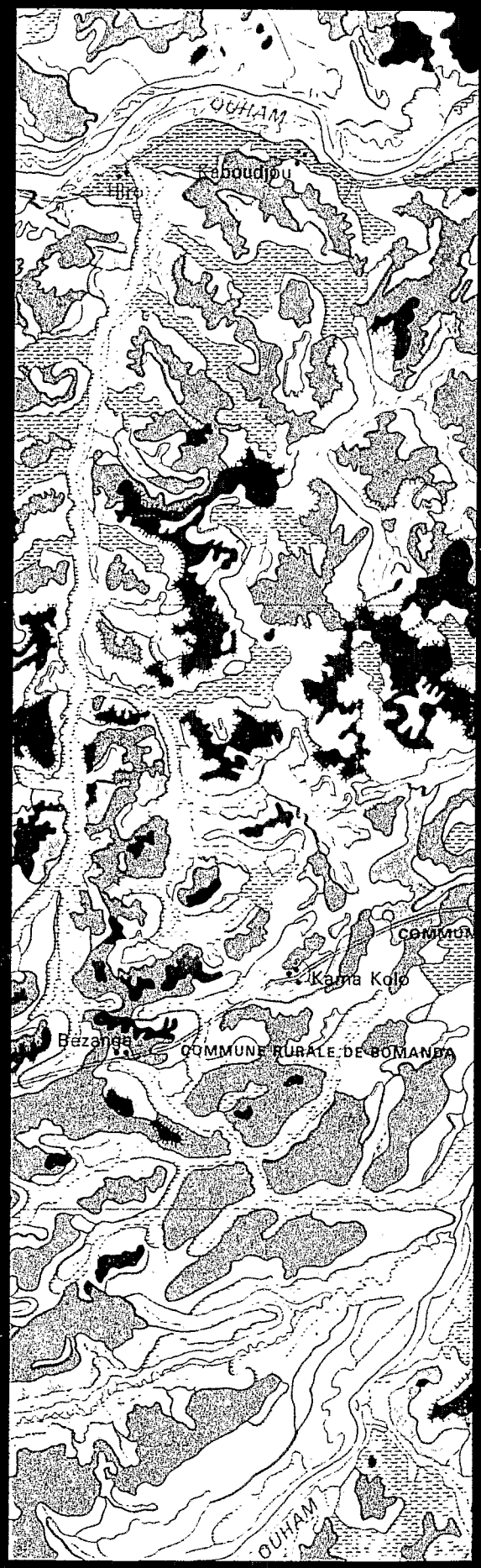

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