MODE OF OCCURRENCE AND TECTONIC CONTROL OF THE KIMBERLITE-BODIES IN EAST-KASAI (Zaïre).

C.L. Fieremans - Technical Manager - Société Minière de Bakwanga - Mbujimayi - Zaïre.

Two main kimberlite fields are known in Zaïre :
- the Mbujimayi-kimberlite field in the East-Kasai province;
- the Kundelungu-kimberlite field in the province of Shaba.

Notwithstanding the fact that the Kundelungu-field is the oldest known (1908) it is only the Mbujimayi-field (where the first diamond was found in 1918 and kimberlite only in 1946) which proved workable.

The Mbujimayi-field is composed of :

1°) a northern group of pipes including ten "bodies" of a xeno-tuff-breccia kimberlite showing in places a "sedimentary" aspect and lying on a straight E-W line. Each "body" does not represent necessarily a "pipe";

2°) a southern group of 4 pipes, also of a tuff-breccia type.

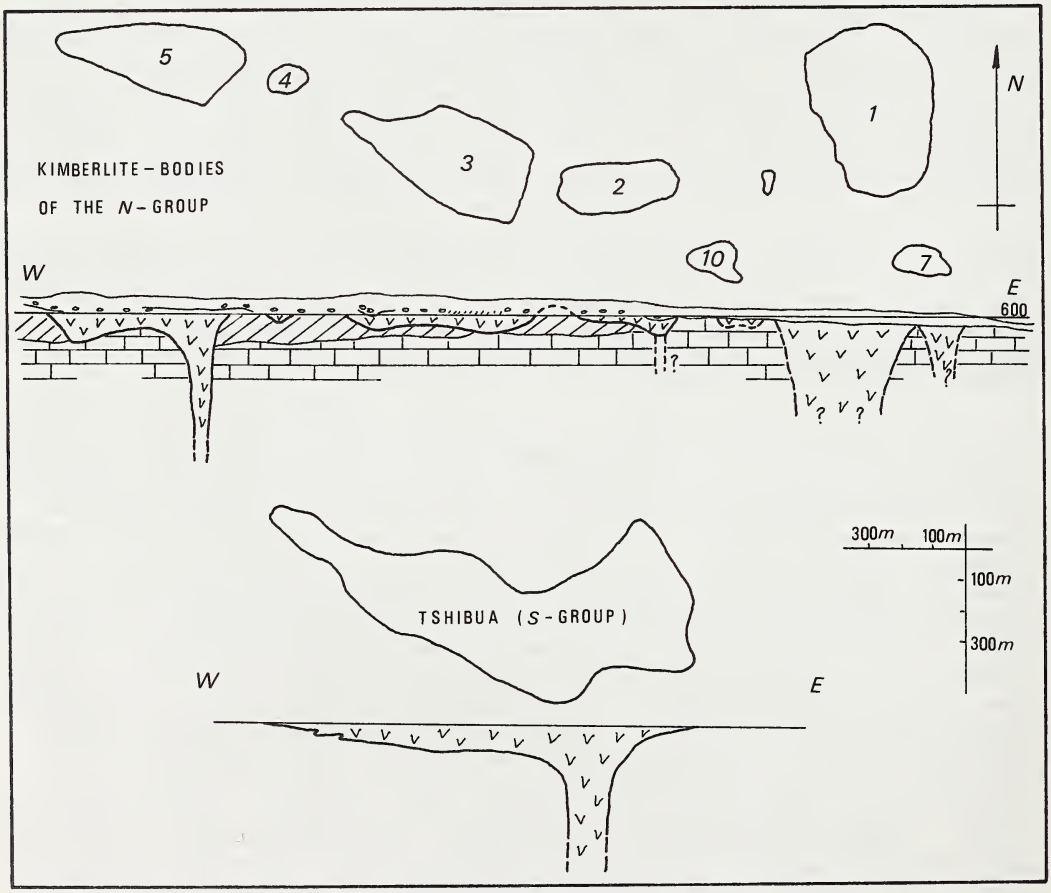
The kimberlite-"bodies" of the northern group exhibit an outstretched elliptical form and small "sacks" of kimberlite tuff occur between them. All lie on an E-W line, interpreted as a crustal fissure of minimum 10 km. length. A deep neck down these bodies is known with certainty in only one case but is suggested in three other cases. The other six bodies constitute tuffaceous material expulsed by the four pipes. One body with N-S orientation probably constitutes a pipe situated on a fault perpendicular on the E-W crack.

There is no visible tectonic connection between this northern group of pipes and the southern group, but the biggest kimberlite body of this last cluster (the Tshibua-pipe) shows also a manifest E-W stretched elliptical form. The body is very flat and connected deeply with a neck or pipe of small diameter, intruded in a deep-seated E-W dyke of norite intrusive in the old precambrian gneissic basement.

As to the Russian nomenclature (cf. Dawson) the kimberlite formation can be described as a xeno-tuff-breccia, containing a large quantity of extraneous material : fragments, blocks and minute particles of the intruded formations (precambrian gneissic basement, dolomitic layers of the Mbujimayi-system, mesozoic sandstone layers). The kimberlitic formation also contains numerous fragments and nodules of a "primary kimberlite", of deep-metamorphic and of eclogitic rocks, besides numerous grains of chromiferous pyrope-garnets, magnesian ilmenites, chromiferous diopsides and green phlogopite. Characteristic are also the yellow zircons and the black-brown baddeleyite. The fragments of "primary kimberlite" are always very altered but one may recognize easily two generations of pseudomorphosed olivine-crystals, the biggest being rounded or sub-rounded. The pseudomorphic products comprise mainly serpentine-minerals, montmorillonite and calcite. The inclusions of deep-metamorphic rocks comprise plagioclase gneisses, with oligoclase, garnet, biotite, quartz and sometimes sillimanite. The eclogites comprise diopsidites, typical eclogites and plagioclase eclogites. Very interesting to note are the silicified nodules where the diopside-grains are completely replaced by quartz. Ultrabasic nodules seem very rare and were only mentioned in the Tshibua-pipe.

Diamonds are for somewhat 97 % of the industrial type, as well in the southern as in the northern group of kimberlites; 85 % is crushing-boart. Characteristic are the dark green or brown cubes with rough surfaces and the very irregular "cindery" aggregates. As to their grade, the kimberlite-bodies of East-Kasai are the richest in the world.

Some authors have placed the East-Kasai pipes in a linear connection with the Angolan pipes situated at somewhat 400 km to the S.W. In particular some great graben-structure - the "Lucapa-graben" - would unite the two occurrences of pipes. As to our own observations however, as well in Zaïre as in Angola, there is nowhere any precise or definite indication of this graben-structure and the most typical tectonic structure in the basement-complex of the Kasai regions and also in Angola is the appr. E-W structure already mentioned. In Angola the most striking directions connecting the kimberlite intrusions are N. 75° - 85° E. and N. 20° W. These directions were also found back during aeromagnetic surveys and in the ultrabasic and basic dykes intrusive in the basement-complex of Kasai. Due to all this, we think that a relation graben-kimberlite does not exist.



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