South-West Pacific Geodynamic Model Based on the Ophiolites and Ophiolite-Related Metamorphic Rocks.

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The Papua-New Guinea, Solomon, New-Hebrides and New Caledonia ophiolitic massifs present beneath the peridotites, metamorphic soles formed in the amphibolite-green schists facies conditions with apparition of blue-schists when the ophiolitic assemblage is thrusted on a continental crust.

The petrochemical and structural study of those metamorphic rocks leads us to suppose that they are the result of a metamorphism arising at the expense of volcanic and sedimentary series forming the upper part of the oceanic crust involved in an intra-oceanic subduction zone. If one can support this hypothesis the almost similar age of the different ophiolite related metamorphic rocks would indicate that they would come from a same mechanism: an eocene intra-oceanic subduction occuring in SW Pacific.

Assuming this hypothesis the following reconstitution would be proposed to explain the breaking up of the eocene ophiolitic belt. The ophiolite emplacement in Papua-New Guinea and New Caledonia, would be directly related to and induced by this subduction. In this case, the presence of a continental crust close to the subduction would be the main factor of the blue-schists formation.

Afterwards or during this ophiolitic emplacement, the trace of the eocene subduction remaining in an intra-oceanic environment as in Solomon and New Hebrides islands would be broken by different transcurrent faults, more recent spreading phenomena and two other subductions (oligo-miocene and recent).

Paleographical and structural evolution of north-eastern Benue Trough during Cretaceous (Gombe-Yola area, NIGERIA)

by PINNA P., MAGNIEN A.P., OJO O.M.

Before the Middle Cretaceous (Aptian ?), there occurs a prominently acid magmatic phase (Burashika complex), with andesites and rhyolites, linked with extensive faulting and regional upwarping. During the Albian (?) extensive faulting produced a sharply-contrasted paleogeography : south of the Yola "triple junction" (Kaltungo threshold), there was a subsident, marine and lagoonal basin (Lamurde) correlated to the Asu River shales of the Lower Benue valley. North of the triple point, active N-S and NE-SW grabens were filled by coarse sub-aerial and fluviatile series. The western Gombe platform remained emerged, and thin, variable series deposited to the East. During the Cenomanian, subsidence rates attenuated and the fluvio-deltaic Bima sandstones prograded southwards along a N-S channel, and finally spread over the whole area. The Turonian marine transgression covered a flat surface.

During the Maestrichtian, a regression commenced in the north (lacustrine Gombe sandstone). Subsequent compressive tectonics induced a homogeneous N.NW-S.SE stress-field, which involved transcurrent and reverse plays of older faults and an E.NE-W.SW cover-folding oblique to the trends of Mid-Cretaceous faults.

The Mid-Cretaceous geotectonics seems to be of the intracontinental rift type with no generation of oceanic crust and very few similarities with ocean-floor-generating rifts. The compressive tectonics appear to be independant of this rift-system (no antithetic closing up), and could be linked with the Laramian phase of the Alpine cycle.

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