formed only in warm water. Finally, vegetation of the adjacent land: *Cynamomun, Ulmus etc. is the vegetation of a warm climate.*

Unlike the Pannonian Province, where Lower Sarmatian is predominant (Middle Sarmatian only partly developed), the Dacian Province includes all three divisions of the Sarmatian: Lower, Middle and Upper. Palaeoecological features of the two provinces, however, are very similar, like those in the Badenian. Sarmatian sediments of the Dacian Province were also formed in a shallow and warm sea.

Significant data about characteristics of a climate and life environments on land in the early Sarmatian, besides vegetation, are obtained from fossil land mammals. In the succession of Tertiary mammal fauna, during Badenian and Volinian, the Prebreza-fauna exists which may be correlated with Chios-fauna in Greece and Platybelodon-fauna in Asia. The structure of Prebreza-fauna shows that even in the early Sarmatian, steppes and savannas prevailed in these areas. Numerous diverse highly specialized bovids *(Hypsodontus, Eotragus etc.) point to that, as well as accompanying steppe predators (Gobicyon, Crocuta* etc.). Still, besides steppe ones, forrest inhabitants are also found there *(Anchitherium, Listriodon* etc.) which had a predominant role in the previous, Angustidens-fauna. Out of the steppe-savanna part of the Prebreza fauna, a new, even richer, steppe Hipparion fauna will have been developed, which will have migrated south and will have dominated during Mio-Pliocene (Pickermi-fauna).

KINEMATIC ANALYSIS AND TERTIARY EVOLUTION OF THE PINDOS-VOURINOS OPHIOLITES (EPIRUS-WESTERN MACEDONIA, GREECE)

D. Mountrakis, A. Kilias and N. Zouros

Dept. of Geology and Phys. Geography, School of Geology, Aristotle University of Thessaloniki, 540 06, Hellas.

Pindos and Vourinos ophiolites are continuous at depth below the Meso-Hellenic Trough and represent fragments of the destroyed oceanic lithosphere of Neo-Tethys. Kinematic analysis of the structures was carried out using shear criteria and kinematic indicators, in order to distinguish the tectonic features of the successive events that affected both Pindos and Vourinos ophiolites. Field data, mainly striated faults, computed using numerical methologies (quantitative analysis) is an approach to define the strain ellispoid for each tectonic event.

Stretching lineations observed in the amphibolites of Pindos metamorphic sole, as well as in the Vourinos ophiolite and the underlying carbonates, are remained elements of the initial emplacement of the ophiolites but they are not associated with the significant kinematic indicators for the sense of the emplacement movement. Tertiary evolution started in Late Eocene time with a compressional, folding, thrusting and

imbrication of the Pindos flysch before the emplacement of the ophiolite over the flysch. It was followed by an important extensive event (minimum σ_3 axes E-W) in Early Oligocene times, which caused a semi-ductile to brittle deformation in the area i.e. major extensive feetures in the ophiolites, the emplacement of the ophiolites over Pindos flysch and certainly the formation of the Meso-Hellenic Trough. Two younger successive events, with the maximum stres axes trending E-W and N-S respectively, took place during Middle-Late Miocene (the second probably evolutionary to the first). Some very import and strike-slip and inverse faults are attributed to both events.

THE NEOTECTONIC STRUCTURE OF THE EASTERN MARGIN OF THE AXIOS - THERMAIKOS GRABEN IN WESTERN CHALKIDIKI (CENTRAL MACEDONIA, GREECE)

D. Mountrakis, G. Syridis, L. Polymenakos and S. Paulidis

Dept. of Geology, Aristoteles University of Thessaloniki, 54006 Thessaloniki

The investigation of the neotectonic evolution of the western Chalkidiki area, representing the eastern margin of the large neotectonic graben of Axios river - Thermaikos gulf, has been attempted through the study of morphotectonics, tectonostratigraphy, fault kinematics, and photolineaments, both from satellite images and aerialphotos. Recent data concerning the Neogene - Quaternary lithostratigraphy of the area, as well as some published results on the palaeogeography and geophysics of the broader region have also taken into account.

The investigated area constitute a weak deformed block bounded by great large structures (North Aegean Trough NE-SW trending dextral strike-slip faults; NW-SE Thermaikos major faults) and important active faults of Anthemountas (E-W normal to sinistral oblique-slip structure), Olynthos (NNE-SSW dextral) and Toronaeos fulg (NW-SE) smaller fault zone. A NE-SW extension effecting pro-Neogene and late Miocene-Pliocene sediments (post Oligocene? - Pliocene) has been weakly detected using fault slip and joints data. The more or less N-S trending middle Pleistocene (?) - active extension and the related faults are well reflected in the morphology, while this phase accompanied by significant strike-slip movements. Dating of some distinct tectonic events to Middle Miocene, Turolian, Ruscinian and Middle Pleistocene arrise from the tectonostratigraphic studies.

