the external Hellenic orogenic wedge over the Adriatic platform. Back-thrust structure geometry with NE -ward vergency is also recorded. Striaetion lineation on the thrust planes exhibits a ENE-WSW to NNE-SSW strike. Paleostress analysis shows a subhorizontal, E-W to NE-SW trending maximum main axis σ_1 and a subvertical minimum main σ_3 -axis.

A late D2 deformation style of Oligocene –Miocene age, overprints the former D1 structures, producing WNW-ESE to E-W trending compressional structures, such as asymmetrical steep folds and thrust faults.

Sense of movement is evaluated mainly towards SSW to S. Striaetion lineation along thrust planes exhibits progressively a NNE-SSW to N-S trend. NW-SE dextral and NE-SW sinistral trending strike slip faults, associated with the D2 compressional structures, induced a SE- or NW-ward orogen parallel motion. Furthermore, some of the D1 thrust faults were reactivated during the D2 as strike slip faults. Paleostress analysis shows a subhorizontal maximum main axis σ_1 in a N-S to NNE-SSW direction during D2 event.

Both in map and outcrop scale curvature of D1 structure trace, as well as the orientation geometry of the D1 and D2 structures, imply a continuous deformation regime during Tertiary time under oblique plate convergence and a transpression related strain field.

Seismotectonic model on geological data for 1892 Dulovo earthquake, lower Danube valley

Shanov S. and Radulov A.

Laboratory of Seismotectonics, Geological Institute, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria, s_shanov@geology.bas.bg, radulov@geology.bas.bg

The potentially active faults in the area of Lower Danube Valley between the arcs of Carpathian and Balkan mountain chains are not properly recognized. The epicentre of the only historically known “strange” earthquake on the territory of Bulgaria with a magnitude evaluated at $M_s = 7$, known as the “1892 Dulovo Earthquake” is situated in this area. The first step for creating a seismotectonic model for this earthquake is the identification of the nearby active fault. The analysis has shown that it is realistic to accept that the earthquake occurred in the frames of the Tutrakan Graben. A fault segment of the Dulovo Fault, the most probably activated during the 1892 Dulovo Earthquake, is recognised. Its length is 42±5 km, and the width is 15±2 km. The offset of the normal faulting from the last seismic events is evaluated at 2 m. Three approaches are used for determination of the maximum magnitude of the earthquake that can be generated. They give M_s in the range between 6.8 and 7.5. The most probable value is 7.0.

Migrations caused by catastrophic flooding of the Black Sea during the Holocene

Shopov Y.[1], Yalamov T.[2], Dimitrov P.[3], Dimitrov D.[3] and Shkodrov B.[2]

[1]*Sofia University, University Center for Space Research and Technologies, James Bourchier 5, Sofia 1164, Bulgaria, YYShopov@Phys.Uni-Sofia.BG*

[2]*Institute of Ancient Civilizations, Dimitar Manov 74-b, Sofia 1408, Bulgaria, fedix@mail.orbitel.bg, bono_@gmx.net*

[3]*Section of Sea Geology and Archeology of the Institute of Oceanology of BAS, Purvi May street 40, P.O.Box 152, Varna 9000, Bulgaria, margeo@io-bas.bg, dimpetdim@yahoo.com*

Geological data suggest an exceptionally large natural catastrophe in the Black Sea region 7500-7600 yrs. BP. Before it Black Sea was a fresh water lake with coasts 90–120 m below the recent sea level. This catastrophic rapid flooding of the Black Sea by the Mediterranean Sea waters was dated in numerous samples by ^{14}C at 7 560 ±50 cal. yrs BP. It flooded 160000 km^2 and destroyed settlements of the early civilizations around the Black Sea coast. At that time here were settled Indo-Europeans.

We mapped the migration of some of the Vedic tribes all the way from the Black Sea region to India by precise positioning of the established 4399 toponims and hydronames formed on the base of their ethnic names derived from processing and linguistic analysis of 6 900 000 toponims and hydronames on the maps of India, Pakistan, Bangladesh, Afghanistan, Uzbekistan and Iran.

We make critical analysis of the available geological and archeological data related to the Black Sea Flood in order to establish its reliability and to refine its dating and extend. We demonstrate that timing of the start of formation of sapropel sediments; the formation of hydrogen sulfide zone in the Black Sea as result of decomposition of the sapropel deposits; the appearance of the first marine organisms and the abrupt replacement of the Black Sea freshwater dinocysts by a Mediterranean population coincide in the frames of the experimental error of the dating, with the best age estimate of 7 160 ±50 radiocarbon years BP= 7 560 ±50 cal. yrs BP. It allows us to relate it with the major human migrations at 7500 yrs. BP as traced and dated by paleolinguistic analysis and archeology. We present a number of climatic, oceanographic, linguistic, calendar, geographic and archaeological evidences suggesting that these events are related. Catastrophic flooding of the region appear to initiate migration of Indo-Europeans and their separation and differentiation in groups like German, Thracian, Illyrian, Greek, Arian, etc. tribes. Thus it strongly affected the development and history of all Indo-European people. The scale of this natural catastrophe suggests that this was perhaps the largest human migration produced by a natural disaster. This work examines the evidence for the flooding triggering this migration and also examines the extent of that migration.

The timing of the Black Sea Flood as determined by marine evidences and the timing of the start of the massive migration out of the Black Sea region coincides in the frames of the experimental error and is the same as the beginning of the Bible chronology (Creation of the World), i. e. 5500 years B.C. and also as the beginning of the Byzantine and ancient Bulgarian calendars (5505 years B.C.). This suggests that this catastrophic event was so dramatic and had so great consequences for great number of people, to be used as the beginning of the time counting by the people leaving in approximate vicinity to the affected region. At that time all Indo- Europeans (including the ancestors of the ancient Greeks and Bulgarians) were settled at the Black Sea coast, so it is quite reasonable to presume that their chronology starts from the Black Sea Flood as far as this was the most dramatic natural phenomena they faced in their history. It is reasonable to suggest that the migration out of the Black Sea region was initiated by the Black Sea Flood as far as it flooded a significant part of this densely populated region. This submerging of 160 000 square kilometers was caused by a rapid rise of the Black Sea level with about 100 meters. It left homeless and without food supply great part of the Indo Europeans settled around the former sea coast. Therefore this most dramatic disaster in the human history forced them to migrate out of this dangerous region. This way the Black Sea Flood played major role in the Indo Europeans history.

We provide vast range of data demonstrating that Black Sea Flood triggered an out-migration from the Black Sea area into India with major repercussions for present population characteristics as established by comparative genetic studies.

Acknowledgements: This research has been funded by grant 02-337 by the National Science Fund of Bulgarian Ministry of Education and Science

Is it possible to use natural resources in a sustainable manner after intensive exploitation?

Shtiza A.

Katholieke Universiteit Leuven, Geo-Institute, Celestijnenlaan 200E, B-3001 Heverlee, Belgium, aurela_shtiza@yahoo.com

Due to the long isolation period and the development of various industry sectors, the contamination of land and additional negative environmental impacts have been continuous and severe in the period 1950-1990 for Albania. Based on data published in literature, this review is a first attempt to put together the natural resources and the sites where the ore