An evaluation of the prospective archaeo-cultural heritage of the Northern Romanian littoral zone

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Large displacements of the Western Black Sea coastline have been encountered during the Late Pleistocene and Holocene due to the Danube Delta's lobs evolution in time which gradually restricted and finally closed the former Danube Estuary and Halmyris Bay. The notable consequences of this processes were the change of the number and position of the Danube River's branches discharging mouths and related human activities such as: habitation, navigation, trade, etc. According to ancient historians (e.g. Herodotus in the 5th Century BC, Polybius in the 2nd Century BC, Strabo in the 1st Century BC, Pliny the Elder in the 1st Century AD, Ptolemy in the 2nd Century AD and others), at that time, the Istros River (the ancient name of the Danube River) discharged its waters into the Black Sea through five to seven mouths (branches), among which the most important was the Hieron Stoma (Holly Mouth), identified today as being the Sfântu Gheorghe branch of the Danube.

The combined result of the coastal zone subsidence (estimated amplitude of -2 to -4 mm/y) and the accumulative sedimentary regime within the Danube Delta area place the prospective cultural layer corresponding to late Prehistory – Early Antiquity at a burial depth that now exceeds 4-5 m, the only feasible way to investigate its extension being provided by geophysics. The applicability of the geophysical methods is also very closely linked to the ability of ancient human beings to modify, through their past activities, the habitation environment by generating local petrophysical contrasts. Such contrasts of physical properties (density, magnetic susceptibility, conductivity, etc.), all of anthropogenic origin, on which existence beneath the earth surface all geophysical investigation methods rely on, were only generated when the ancient inhabitants started to use the fire in increasingly larger scale, to excavate, to build (especially when using materials of allochthon origin) and, never the less, to use metallic tools and weapons. According to information gathered on the archaeological sites excavated on the adjacent Northern Dobruja, all these steps toward a better geophysical discoverability have been concluded since Early Bronze Age (3rd Millennium BC). The deep burial of the past cultural layers, set close to the sea level in ancient time, could explain the lack of success of all archaeological works carried out during the last decades toward the discovery of the Histria's and Argamum's ancient harbors.

The present position of the inhabited areas suggests the ancient ones were also located along the paleo-branches of the Danube and in the vicinity of the shoreline, at a safe distance from the effects of sea storms. Therefore, the most promising areas in this regard should be of course located in the close vicinity of the Sfântu Gheorghe branch's paleo-banks, the most important distributor of the Danube River in Ancient times. Here, on several points located on the littoral sector confined by the present day Sfântu Gheorghe and Sulina branches' mouths, the sea waves bring on the beach pottery remains originating from undiscovered yet antique wrecks caught in the relict beach ridge system and dug out by the intense erosion that presently deepens the seabed by 0.25 – 0.5 m/y.

The possibility that the beach ridges system was born until approximately 500 years AD in the southernmost part of the Danube Delta, that gradually closed the former Halmyris Bay, partly covered today by Sinoie Lagoon and marine shallow waters, to host remains of fortified points and mostly wrecks of the ancient ships connecting Histria and Argamum fortresses with other harbours of the Black and Mediterranean Sea, must be considered. Numerous fragments of pottery brought today by waves on the beach south of Gura Portiţa could be reworked from the erosion submerged beach ridges and clearly sustain this hypothesis. This entire prospective archaeological load, with ages ranging from 8th Century BC to 5th Century AD, contained by the Împuţita - Câşla Vădanei and Coşna - Vadu littoral sectors, supposed to be represented mainly by wrecks of ancient ships, are in

an imminent threat of being washed out by the intense erosion that now affects the shoreline as well as the adjacent seabed.

The results from monitoring of the Krupnik seismogenic area in SW Bulgaria

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The new results from monitoring of the Krupnik seismogenic area in the Southwest Bulgaria are presented. Special attention is paid to the geodetic analysis using present-day GPS data and seismological modelling of regional stress field in order to constrain the kinematics and dynamics of the region. On the base of the complex analysis of the recent seismicity, geodetic data and fault plane solutions modelling we can conclude that the present tectonic activity in the Krupnik area in SW Bulgaria is associated with the main geodynamic processes in the central part of Balkan region.

The Black Sea – an energy crossroads and/or an unconventional energy and resource center in Europe

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The irregular geographic distribution of the raw materials for the energy industry such as oil and gas on the world geographic map creates a problem with their transportation to the end consumer. Nowadays hydrocarbons are transported by tankers or via pipelines. Pipelines are preferable due to a number of reasons. Their advantages make them very attractive and are expressed as follows:

- considerably shorten the distance to the end consumer;
- transport charges for the transit of the products are avoided;
- risks of pollution during this means of transportation are reduced.

Russia and the countries from the Caspian region, the Middle East, the North Sea and Middle Asia are seen as the natural centers of energy resources for Europe. Since these centers of energy resources are available the economic advantage of their use is determined mainly by the methods of their transportation to the end consumers. Two competitive projects - the South Stream and Nabucco – are launched.

Even today we can often hear apocalyptic prophesies of the near end of oil and gas era and appeals to industrial societies to quit the use of oil and natural gas and to start using alternative energy sources and raw materials.

The only outcome is the search for unconventional (alternative) sources of energy, moreover that the prices of these resources will continue to grow in the foreseeable future. The search for unconventional alternative (oil and natural gas) resources and the prospects for their use will bring reassurance for the future of humanity.

New results were obtained over the past 20 years in the sphere of unconventional resources of energy in the Black Sea and the sophisticated technologies that made possible the development of several pilot projects. The topmost is the project for research and production of methane gas from the gas hydrate deposits on the bottom of the Black Sea.

The studies of DSOMS as a complex resource have indicated broad perspectives for their application in the sphere of agrobiotechnologies, nanotechnologies, construction sector, medicine and other spheres. Under the conditions of chronic energy crisis and shortage of quality food products we have to pay special attention to unconventional raw materials and resources of energy. An important factor for the organic farming in Bulgaria is the use of the