4.8.6. CONCEPTS FOR GEODYNAMICS OF THE BALKAN PENINSULA IN SERBIA AND MONTENEGRO

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Majority of experts in tectonics in the regions of former Yugoslavia accepted the plate tectonics concept in a short period of time. They did not consider how realistic the concept was, but tried to formulate as original as possible tectonic concept of these regions using the plate tectonics concept as the starting point.

It was possible to find virtual explanations of some tectonic events using opening and closing of micro-oceanic regions and movements of micro-plates. However, those explanations could not be controlled and therefore can be placed within the domain of constructions.

Among these views, some theoreticians believe that the outer Dinarides floated from somewhere to their present position. There are some views claiming that the Adriatic plate was subducted below the outer Dinarides which caused the Dinaric blocks to slope towards southwest. Earthquakes along the Adriatic coast have been explained by submerging of Africa below the European continent, etc. Nevertheless, due attention is not paid to vertical faults parallel to the coastline of the Adriatic sea. Along those faults carbonate basement permanently descends in a part of the sea enabling deposition of 1,500 meters thick sedimets in Pleistocene. Deposition of so thick sediments happened simultaneously with the gradual faulting and lowering of their basement; which resulted in release of energy and earthquakes.

Within the course of investigations of hydrocarbonates in the region of the outer Dinarides and the Adriatic Sea, seismic investigations were performed on several occasions and several wells were drilled. Interpretation of the obtained makes it possible to get a more realistic view of the tectonic and depositional development of the rock complex in the region of the Dinarides and the Adriatic Sea. It also makes possibility to estimate different schemes and models that appeared in this area based upon the plate tectonics concept.

In the course of oil geologic investigations that took many years, using the whole set of up to date geological and geophysical methods, useful results were obtained. They make possible a unique approach in comprehension of the basic elements of geotectonic and depositional – historic development of the rock complex in certain parts of the onshore and offshore areas of Montenegro.

It is obvious today that all hydrocarbon reserves are related to the contemporary sedimentary basins or the basins that had once existed and than broke down in the course of geotectonic and depositional development, so that hydrocarbons can be found in the reduced parts of those basins.

There is a large number of realistic information (seismic profiles and wells) obtained from different geotectonic entities, types of basins and areas of different depositional

and stratigraphic characteristics of the sedimentary complexes. Analysis of those areas make it possible, using similarity criteria, to comprehend the mentioned elements in a more realistic way even in those regions for which there are considerably less available information.

Two types of deposition can be observed within the contemporary sedimentary basins: clastic and carbonate. As it is known, carbonates are the only rocks produced from the material present in the same environment in which they are being formed. Clastic depositions are produced from the material connected in the relief and lithological composition of the adjacent hinterland area from which water flows transport the material into the basin.

The basic elements conditioning carbonate sedimentation are tectonics and climate, which together control the other important variable – rising and lowering of the sea level.

However, the most important role is played by geotectonic relations because they set up the basic condition of carbonate sedimentation – they prevent the basin from being filled with clastic and muddy materials. There are numerous cases throughout the World confirming it.

What has been said indicates that analysis of depositional cycles could be used as the ground when we make conclusions about Paleo-tectonic properties of the adjacent areas, as well as about the position of the source of sedimentation in time related circumstances.

According to the obtained results, tectonic genesis, with some phases of longer or shorter inaction, gradually moved from the region of the Paleozoic mountain ranges in the North to the frontal region of tangentially deformed Miocene clastic sediments in the SW part of the offshore area of Montenegro. This complex gets thicker moving towards the coastline region including paleogenic clastic sediments. These deformities in the coastline area partly include Mesozoic carbonates.

In deposited sediments in this onshore and offshore area alteration three depositional cycles can be observed, starting with the Paleozoic – Mesozoic clastic sediments within the paleo-foreland zone of mountain ranges of Paleozoic age then Mesozoic carbonates and finishing with Paleogenic and Neogenic clastic sediments (Fig. 4.8.6.1.).

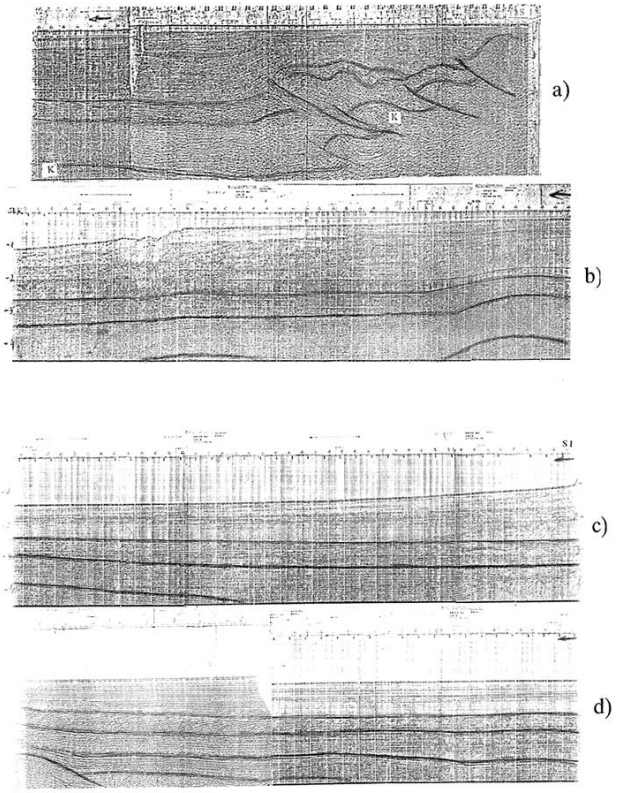

Fig. 4.8.6.1. Seismic line Bar/Montenegro – coast area of Italy (Dragasevic, 2005)

In Figs. 4.8.6.1. and 4.8.6.2., covering the area between the points in the vicinity of the Montenegrin and Italian shores, it can be observed that the rock complex between the frontal zone in the offshore region of Montenegro and Italian shore is tangentially non-deformed, with sediments deposited from Triassic to Quaternary period.

This tectonic depositional development covers the period of about 240 million years and the region about 200 kilometers wide.

This analysis of tectonic and depositional development of the Dinaric rock complex and the sediment complex in the Adriatic sea shows interdependence and continuity of the elements of tectonic and depositional events both in time and space. It excludes possibility of making various constructions in tectonic developments in these regions that would be based on subduction zones, opening and closing of oceanic areas that had appeared and disappeared in short time intervals without leaving any real trace upon which these processes might be followed.

By analyzing tectono depositional relations of rock complex of Dinarides mountain could be concluded that effects of orogenic movements were transmitted in phases from NW to SE. Tectogenizes were transmitted from central Paleozoic zone to the frontal line of tangential deformation in Adriatic sea area at distance of 200 km. That took around 240 millions years. This is approximately the same time as was necessary, to Africa and South America after plate tectonics concept to drift apart each from other for approximately 5,000 km.

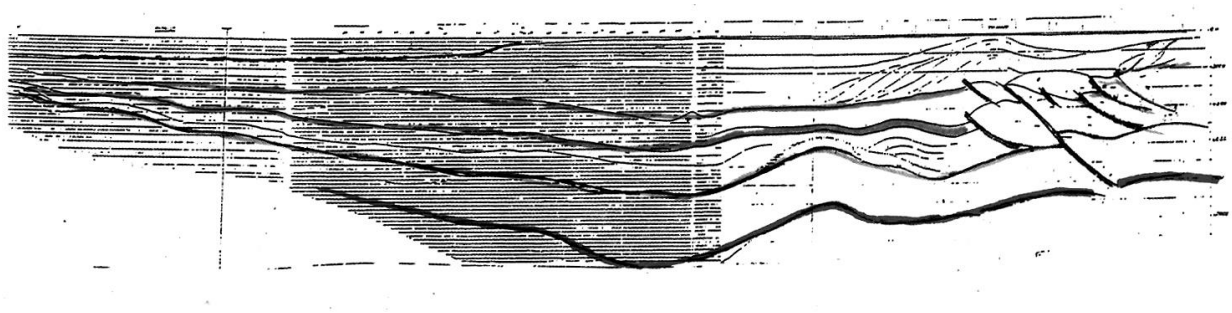

Fig. 4.8.6.2. Depth profile from the Fig. 4.8.6.1 (Dragasevic, 2005)

The new global tectonics does not take into account that historic development of the Earth has lasted for several billions of years. It also neglects the principles of that development. It takes into consideration only its last short time interval, in which the present global positions of oceans and continents already existed.

Nevertheless, the question arises of what was there before that and which are the ways of the Earth's development in the future?

It is necessary here to remind of the fact that the Earth is a part of the Solar planetary system. Therefore, all the principles and natural laws acting in the space to control interdependance and relationship among the cosmic bodies, minor or larger complex systems also apply to the Earth being a part of the Solar system.

Universal law of gravitation was also the basis for establishment of the contemporary balance within planetary systems. At the same time it was the basis for preservation of similar configurations, which were capable of adjusting themselves to that universal law. Formation of the Earth as a planet is measured in hundreds billions of years. Most probably, the Solar planetary system was differentiated in that time period as well. Effects of mutual interdependence and universal law of gravitation are manifested throughout the Earth in the form of tide alteration caused by the resulting effects of forces of gravitation at various positions of the Moon relative to the Earth and Sun.

Had such a radical redistribution of the mass of the Earth's crust and lithosphere happened in such a short period of time as claimed by the plate tectonics concept, the question necessarily arises about preservation of its rotational balance and balanced inter-relations within the entire planetary system.