existence observed on high-resolution seismic sections that might have caused 10-12 km deep crustal subsidence of South Caspian Basin during Pliocene-Quaternary time. There are convincing signs of subsidence accommodated deposition of Pliocene seismic unit with their mites and horizons thickness increment trend towards the basin center where total Pliocene thickness averages 6-7 km with its base subsided down to 10-13 km during that time (Fig. 3). Due to the second option, basin subsidence is supposed to be driven by the solid crustal transtensional processes at recent time. Geodynamic condition of the region precludes resurgence of crust spreading and rifting subsidence of a solid crust and a relatively cool crustal blocks underneath the South Caspian Basin. Low heat flow and crustal neutral seismicity appears to have eliminated this option, too.

Fair correlation of geological events that took place almost synchronously and unusually quickly rise and thrust of mountains, extreme reduction of dimensions of depression and abrupt subsidence of the bottom, extra-avalanche sedimentation) indicates to a strong geodynamic factor acting on the crust in the area of convergence of the plates. This factor induces unusual reaction of a thin-oceanic consolidated crust of depression. In the zone of contact of this crust with a thick continental crust of the platform, with different rheology and lithology, actions of colossal compressing forces from the south and huge isostatic load from above resulted in subduction that was a starting “pulse" for abrupt subsidence of sedimentary formations and subsequent events.

Subduction of consolidated crust of depression is clearly seen on the models prepared with the use of data of ultra-deep seismometry (common depth point), seismotomography seismology and gravimetry (Fig. 4 and 5).

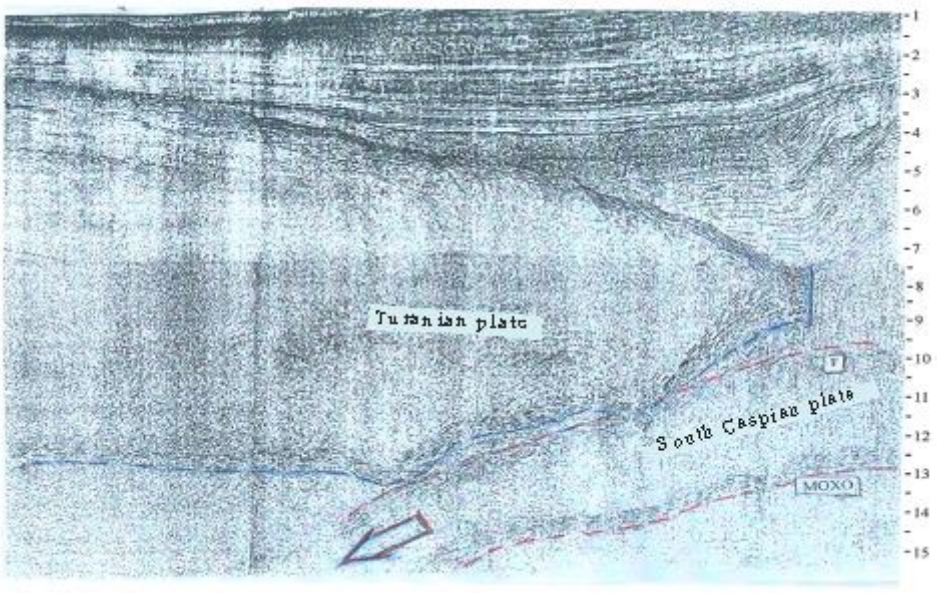

Fig. 4 The image of the Southern of ep-Hercynian platform and subducting oceanic type crust of South Caspian Basin.

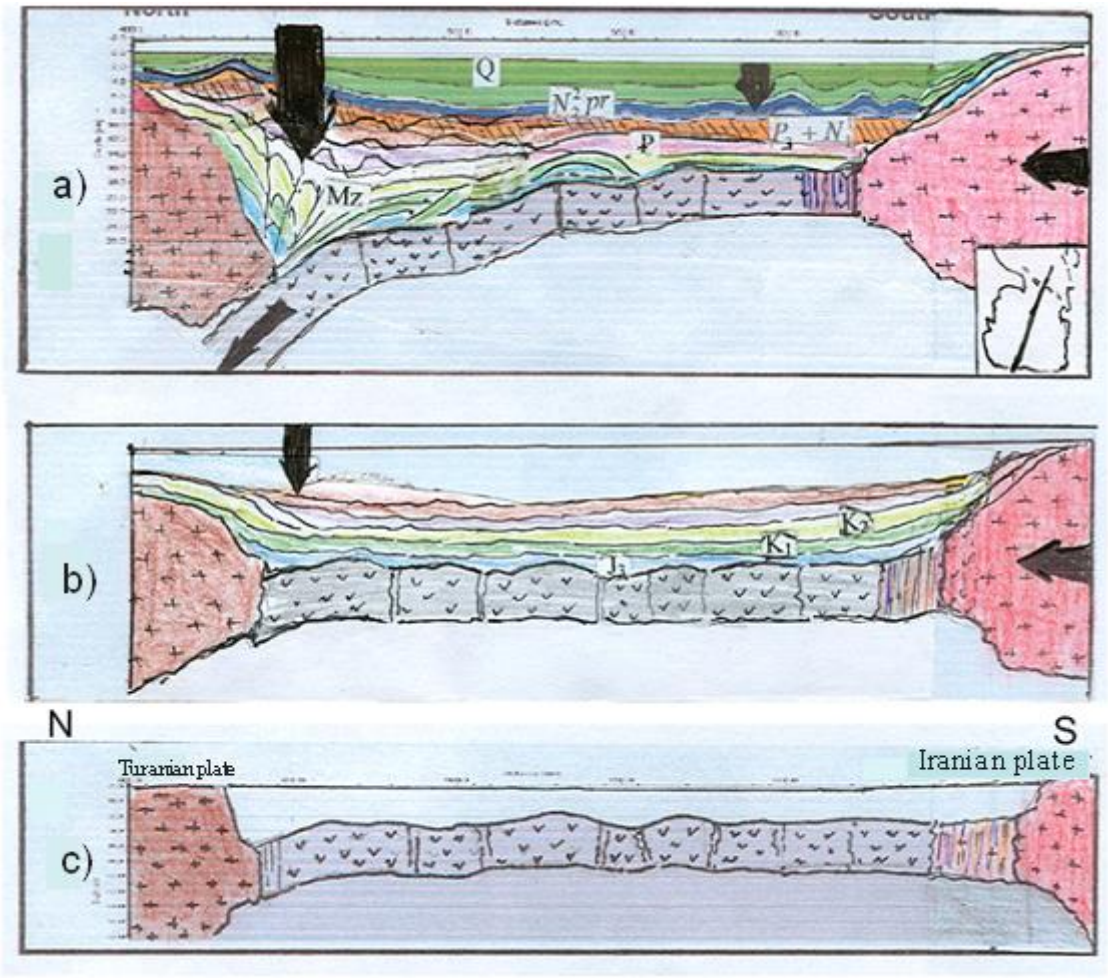

Fig.5 Illustration of subsidence and subduction stages of SCB oceanic crust under the influence of geodynamic compression regime and the overburden pressure.

3. ANALYSIS OF FEASIBLE REASONS OF SOUTH CASPIAN BASIN RAPID SUBSIDENCE

Brunet at al., (2005, 2013, 2013) consider one of the feasible causes of rapid subsidence during Pliocene-Quaternary time as bending effect of increasing transpression upon the basin lithosphere. The point of an offered mechanism is the effect of initial bending stage of elastic plate respond on external force similar to that of lithosphere as a whole. In order to calculate effective thickness of lithosphere along the basin longitudinal section a special algorithm has been used. South Caspian Basin lithospheric section has been simulated based on P.Z.Mamedov (2006, 2012).

Simulated South Caspian Basin overburden was assumed to be around 25 km thick, and a solid crust 10 km thick. Transpressional tension equating to the fold of 25 of typical interplate stress had caused just 2- 3 km subsidence. Such magnitude of South Caspian Basin crustal subsidence was sufficient to fill the basin with additional 2-

3 fold of sediment influx (that is, in the range of 4-8 km thick, making allowance for sediment compaction and basin depth shallowing from 2.5-3.0 km depth in Miocene down to 0.5-1.0 km during Quaternary time). Geophysical data acquired recently, from South Caspian Basin survey along with geologic/geophysical intelligence related to structural evolution of the region shed light on the basin rapid subsidence as a result of subduction process P.Z. Mamedov, (2005, 2012).

According to some geoscientists Caucasus - South Caspian sector of AGPP is referred to the long lived subduction zones where Tethys and Meso-Tethys closure signs are witnessed. Intracontinental subduction zone in these segment has been traced based on region-wide seismic tomography data. Zonen-shine et al., (1990) and others assume that South Caspian Basin and adjacent areas are precisely the areas where several ancient and recent subduction zones have been encipient and evolved. He considers that within the juncture of TransCaucasus and Euro-Asia plates during orogenic stage there appear to have generated an Amshtuts typte intraplate subduction zone slopping down to the north. According in P.L. Zonenshine et al., (1990) an extensive sive underthrust of Transcaucasul microcontinent had happened at 6-7sm\yr rate. The undertrust intensity significantly decreased during Oligocene-Miocene and its rejuvenation resumed by Later Miocene-Early Pliocene. Was suggested that most subduction zones slopping down under Great Caucasus was kept live up to Quaternary time. Increasingly, subduction processes might have resumed within collision zone of South Caspian and Epi-Hercinian platform at the extremely trans- pressional stage. South Caspian solid crust subduction beneath the platform has been displayed in several sketches and models built up based on seismology, gravimetry (Granath et al., 2000), as well as a result of paleogeographic analysis.

Some of these concepts are very simplified and heuristic. Of all available South Caspian basin crustal models,. (Fig.2 ***b,*** 3) are justified based on actually reliable data of ultra-seismic long record Common Depth Point (CDP) data (16-20\sec) that provide picturesque information related to solid crust geometry, its thickness and geologic setting. A long record (CDP) reflection survey carried out over the conjunction zone, where South Caspian basin abuts Epi-Hercinian platform, has revealed that ocean type crust plunges down to the north with superimposed swell and a mosaic of basalt layer squash above (accretion prism), that along with other available data (gravimetry witnessing about deficit of dense masses, seismology supplying data about deep-seated earthquake focuses around Absheron sill) are the convincing arguments for South Caspian basin crustal subduction verification. Submitted subduction model is one of interplate tectonic models of the region evolution. Fig. 6 shows subduction oceanic crust of SCB and deep-seated earthquakes focuses around Absheron sill.

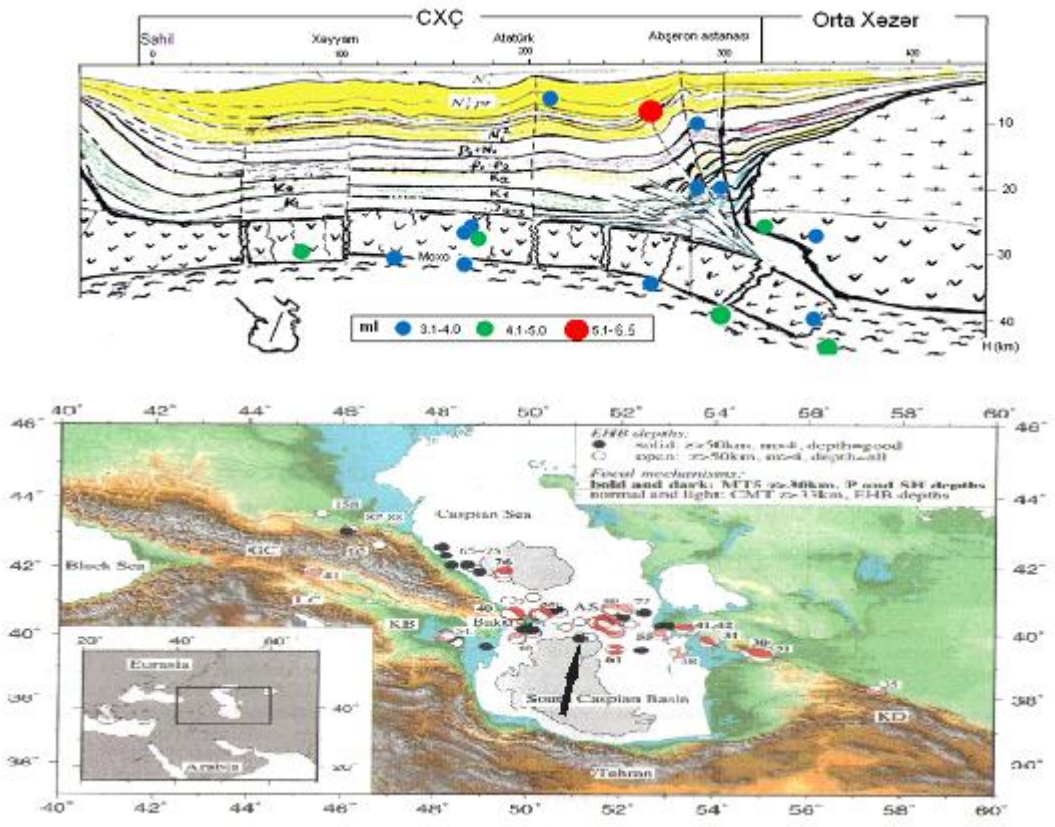

Fig. 6 Illustration of subduction oceanic crust of SCB and deep-seated earthquakes focuses around Absheron sill.

4. CONCLUSIONS

That might be a result of extra ordinary event happened in the region that had been exerted by a strong geodynamic process as convergent of plates to cause the ocean crus respond within a contact zone will thick continental crust of the plat form with different lithology and rheology.

Increasing transpressional strew exerted from the south and vertical force caused by overburden served as a threshold mechanism of the crustal abrupt subsidence and it! subduction under the platform It is1 just that very case when subduction might have caused abrupt sea floor subsidence at the Pliocene onset Alternative geodynamic process enable to cause such interrelated even except subduction is unimaginable.

Good correlation of extra ordinary geologic events happened almost simultaneously in extremely rapid pace (extensive emergence o mountain systems, overthrust and diapirism, basin shrinking and rapid subsidence, avalanche sedimentation) during the last 5.5 Ma in the region witness that all these events had been entailed by the same geologic event, that is, a crustal transpression that triggered subduction and sea floor subsidence that was most extensive in its northern

part.

Modelling suggest that it is possible to account for the observed pattern of subsidence and sedimentation in the South Caspian Basin by a process of sediment loading and compaction on a thermally-subsiding, later Mesozoic crust . Analysis of earthquake focal mechanisms and epicenter depths show that the north ern margin of the basin, the Absheron Ridge is characterized by deep earthquakes at depths down to 90 km. These deep earthquakes have been interpreted to result from the subduction of South Caspian oceanic crust beneath the Absheron Ridge.

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