Astenospheric Subduction and Oceanization

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History and mechanics of differentiation of the lithosphere formed before the Phanerozoic shown. The expansion of the Earth, which had occurred at the middle of the Paleozoic, resulted in dividing of the lithosphere by deformational belts into plate heterogeneities split by intra-plate belts into central (protocontinental) and marginal (protooceanic) platforms.Convective astenospheric flows flew from protooceanic middle ridges below the plate margins and melted sialic elements out of their basements. The enriched with these elements flows were extruded below protocontinents, growing and granitizing the lithosphere. Early Alpine expansion of the Earth in the Jurassic supplemented the astenospheric flows with the axifugal spreading and plateau-basaltic volcanism of protooceanic platforms. Late Alpine contraction of the Earth in the Late Cretaceous has been marked by healing of spreading joints and by retreat of the front of volcanism towards the mid-oceanic ridges, accompanied by rejuvenation of early spreading anomalies.Redistribution of lithosphere substance was accompanied byemergence of continents and dynamothermal basification of protooceanic platforms. In the process of the Alpine spreading, dehydration of serpentinous hyperbasites of the basaltic layer of the protocrust occurred and Moho boundary rose; eclogitic layer zonally transformed into gabbroid one due to basaltic intrusions. This layer became the third oceanic layer during isostatic submergence of platforms, which had followed the retreat of the front of spreading volcanism. The oceans were supplemented with the released at the basification water, which had oceanic salt composition. During neotectonic expansion of the Earth, which had begun in the Late Miocene, the World Ocean originated. Its origin marked the radical breaking of the geotectonic regime.