3-3. - CRUSTAL SPLITTING DURING ALPINE SUBDUCTION IN THE EASTERN ALPS.

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Recent structural, metamorphic and geochronological studies have substantiated the traditional view that the Mittelostalpindecke of the Eastern Alps has a completely different geological history from that of the underlying Pennine basement. The Mittelostalpindecke has overridden the basement northwards by at least 80 km and is today separated from it by a complexly deformed series of rocks which include an extensive body (Peripheral Schieferhülle) of severely deformed and stratigraphically disordered and metamorphosed Mesozoic pelagic sediments and greenstones.

These are interpreted as a melange of oceanic floor material trapped between two areas of continental plate which collided after subduction of the intervening oceanic crust.

On the other hand seismic evidence today shows present plates to be between 60 and 100 km thick. The Mittelostalpindecke is, however, unlikely to be anywhere thicker than 15 km and the crystalline basement rocks which make its lower parts show no evidence of ever having been buried much deeper than this. The Mittelostalpindecke can, therefore, only be the uppermost part of a plate. It is proposed that as the two continents met, the southern one split into a thin crustal flake which over-rode the continent to the north and a thicker lower part which descended into the mantle along a Verschluckungzone inclined to the north beneath the Tauern. The Periadriatic intrusives, and the alpine metamorphism and mineralization are the result of heat generation during the Verschluckung process. The resulting disposition of crustal and subcrustal material provides a reasonable explanation of the distribution of crust and uppermost mantle seismic velocities in both the Eastern and Central Alps.