



Reconstructing Roman road network in Pannonia using anaglyph technology of rectified archive aerial photographs

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Transdanubia, the western part of Hungary, was part of Roman Empire as Pannonia Provincia for almost 500 years. The Danube river as a natural boundary served as limes, the border of the Empire for most of the time. Pannonia had very good communication with other provinces and Rome. However, we know very little about the location of this road network today. The main parts are known: the Amber Road on the west side, the limes road on the north and east side along the Danube, and in the south the road along the Sava River (in Croatia). Unfortunately, in the inner part of Pannonia only some small sections of the roads have been recognized. As a further problem the cities mentioned in Roman itineraries, (eg. Itinerarium Antonini, 4th century AD) and the explored ruins of Roman settlements can not be matched convincingly.

The reason why the identification of Roman roads is especially difficult in Hungary is partly the reuse of the stone material in medieval times and, more importantly, the destroying effect of the deep ploughing by heavy tractors applied since the late 1960s.

A widely used tool, the aerial photography is applied to reveal the traces Roman roads south of Lake Balaton, Hungary. Because of the aforementioned agricultural effects 50- year-old archive military airphotos of the Archive of the Institute of Military History (Budapest) were used in the study.

The images have been orthorectified in modern a coordinate system and combined with a high-resolution digital elevation model (DEM). We also have created anaglyph images. In these imagery we have spotted some linear features aligned with Roman camp directions.

In the Roman times the course tracing of roads was a difficult task because of the dense forest cover of the area. On flat wetlands they built roads in straight lines connecting mounds. In the gentle hilly region of Transdanubia, Roman engineers connected hill-tops with good visibility. In the mountainous areas roads are heading passes.

The position of the recognized linear features identified on aerial photographs fits to these conditions. This may imply that they are or were remnants of Roman roads. Today it is extremely difficult to check the validity of this assumption, because most of these sections could be destroyed or considerably disturbed. The image dataset has been rectified in the framework of the project T47104 of the Hungarian National Scientific Fund (OTKA). The Archive of the Institute of Military History (Budapest) is thanked for their close cooperation.