

HUNGARIAN GEOGRAPHICAL BULLETIN

2011

Volume 60

Number 3

CONTENT

Studies

- Ferenc SCHWEITZER, János BALOGH, László TÓTH and Péter MÓNUS*: Relationships between geomorphology, neotectonics and earthquakes in the Danube Flat between Ercsi and Madocsa and on the Danube–Tisza Interfluvium233
- Éva KIS, Ferenc SCHWEITZER, István FUTÓ, Gergely VODILA, János BALOGH and Mária DI GLERIA*: Special paleogeographic characteristics and changes in $\delta^{18}\text{O}$ values in Upper Pleistocene deposits of the Moravian Plateau247
- András TRÓCSÁNYI*: The spatial implications of urban renewal carried out by the ECC programs in Pécs261
- Tamás T. SIKOS and András KOVÁCS*: Retail competitiveness in a middle sized border town (Komárno, Slovakia)285

Literature

- Glückler, J., Ries, M. and Schmid, H.*: Kreative Ökonomie. Perspektiven schöpferischer Arbeit in der Stadt Heidelberg (*Ferenc GYURIS*)307
- Jeffery, S. et al. (eds)*: European Atlas of Soil Biodiversity (*Zoltán SZALAI*)309

Chronicle

- Report on the 6th International Congress of the European Society for Soil Conservation (ESSC) (*Ádám KERTÉSZ*)311
- Report on the 2011 Annual Meeting of the Association of American Geographers (*Zoltán KOVÁCS*)317
- In memoriam David Turnock (1938–2011) (*Erika NAGY*)318

Relationships between geomorphology, neotectonics and earthquakes in the Danube Plain between Ercsi and Madocsa and on the Danube–Tisza Interfluve

FERENC SCHWEITZER¹, JÁNOS BALOGH¹, LÁSZLÓ TÓTH² and PÉTER MÓNUS²

Abstract

Investigations into interrelationships between geomorphology, neotectonics and seismicity in the Danube Plain and in the northern part of the Danube–Tisza Interfluve bear importance due to the socio-economic significance of these landscapes. Studies on geomorphology and neotectonics are aimed at getting knowledge about the landform evolution of the actual surface, seismic events and at collecting evidence of the latter. The results have been represented in thematic maps, where landscape boundaries based on genetic notions coincided with neotectonic fault lines in several places. In order to make geomorphological and tectonic models correct the geological sediments of the high bluff of the Danube were analyzed palaeogeomorphologically, lithostratigraphically, chronologically and sedimentologically. The most important fault lines and areas of subsidence were singled out according to geomorphological and seismological features.

Keywords: geomorphology, neotectonics, fault lines, areas of subsidence

Introduction

Neogene history of evolution of the Carpathian Basin has played an essential part in geomorphic position, extension of micro-landscapes, and shaping landforms in the Danube Flat and on the Danube–Tisza Interfluve. After the regression of the Pannonian inland sea structural movements, i.e. uplift and subsidence of various degree, occurred. Intense movements during the late Pliocene and early Pleistocene accompanied by red clay formation have been responsible for the emergence of macro landforms, whereas crustal movements having resulted in microforms continued into the Holocene.

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An antecedent of the present-day drainage system was a consequence of these structural movements plus that of the erosion by water and sedimentation during the post-Pannonian, i.e. late Pliocene Csarnotanium.

Pliocene and Quaternary deposits, Pleistocene alluvial cones, landforms initially built of wind blown sand during Pleistocene and subsequently rejuvenated by sand motions in early Holocene, flood plains and channel configuration of water courses are typical of micro-landscapes to be studied below. In some places boundaries drawn according to genetic notions coincide with fault lines of neotectonism.

Sketch of the Neogene evolution in the Carpathian Basin

In the early Miocene most of the land what is now Hungary was part of a continent with landform evolution characteristic of subtropical areas. This terrestrial period terminated in the Carpatian phase, when crustal movements triggered marine transgression in two narrow strips from the south-west. Transgression kept on in the Badenian phase so the land had become smaller than the areas inundated by sea.

Provoked by tectonic movements that occurred at the end of the Sarmatian an intense subsidence of the present territory of Hungary and the larger Pannonian Basin started. At the same time due to the uplift of the Carpathians and Dinarides the inland sea having existed at the end of the Sarmatian became separated from the remains of the Paratethys and turned into a lake. It had a single connection with the Wallachian Lake across the present-day Iron Gate (WEIN, Gy. 1969).

Resulting from an intense subsidence of the basin the Pannonian Lake had covered a substantially larger area than the Sarmatian inland sea used to occupy. An overwhelming part of the Hungarian Middle Mountains, however, remained uncovered. Moreover, in the lower Pannonian stage a few islands existed in both Transdanubia and Great Plain (Alföld). Most of them were affected by marine transgression only later, during the upper Pannonian.

All the lakes as a rule become filled up by sediments sooner or later, especially those surrounded by a high mountain frame such as the wreath of Alps, Carpathians and Dinarides. Sedimentation of the Pannonian Lake had taken a relatively long time, because its bottom level, and that of the Great Plain in particular, had been in a permanent subsidence. The sedimentation took place through deltas. Lake currents transported the very fine grains (mud, silt) that did not deposit in the deltas, so they had reached the deeper parts of the basin and spread over there.

In the ultimate phase of sedimentation during the upper Pannonian (i.e. Pontian) stage the lake became very shallow. In the peripheries of the

Pannonian Basin formation of alluvial plains started and the rivers transported abundant sediment inside the basin. So the lake transport of an utmost importance previously had become subordinate steadily. Gradually the whole sedimentary basin turned into a fluvial-lacustric system. The rivers of this specific drainage network deposited a huge amount of sand. Cross-bedded sand with a thickness of 30–100 m had extended almost all over Transdanubia.

Within a relatively short period, by the end of the Pliocene the gradually shrinking lake had become filled up with a large amount of sediments brought by its tributaries; thus the Great Plain became an alluvial flat. At that time however Transdanubia was situated somewhat higher than the Great Plain which kept on subsiding. Coevally with the regression of the Pannonian Lake a new drainage network emerged in the basin. Nevertheless, that pattern of hydrography differed from the present-day one to a considerable extent.

Relation between recent crustal movements and geomorphology

Geomorphological investigations and studies on neotectonism are aimed at gaining knowledge about history of geomorphic evolution, analysis and provision of evidence about earthquakes.

A differentiated accumulation of Pleistocene–Holocene deposits refers to crustal movements extending over the entire area of Hungary even nowadays. Regional pattern of persistent subsidence is indicated by the thickness of Quaternary sediments over the lowlands. On the other hand an overall spread of an overall strong denudation testifies to an uplift character in the Middle Mountains. These trends, however, are liable to changes. For example in the western part of the Transdanubian Hills the subsidence of Zala Hills has turned into uplift so that Pannonian sediments are to be found up to 300 m a.s.l. (Kandikó, 301 m). Quaternary fluvial deposits only survived in patches owing to the denudation in the course of the elevation (PÉCSI, M. 1959).

Three focus areas of the ongoing subsidence in the Great Plain are South Tisza, Jászság and Körös depressions, where the Pliocene sediment have sunk to a depth of 600 m below surface, depicted in the maps of deposits underlying Quaternary sediments by UrbANCSEK, J. 1961, 1965. (*Figures 1 and 2*).

Relationship between rivers and depressions is explained by a constant striving of water of liquid state to move along the slope in a shortest way to reach the local base line represented by the nearby depressions. This is the cause of the strong impact of crustal movements upon the drainage network; this is why all recent depressions had turned into focuses of drainage and remained so until present, though water regulation measures diminished this relationship considerably. Extensive flood plains, channels of uncertain direction in the Little Plain and Drava Valley, at Maros mouth, Körös rivers and

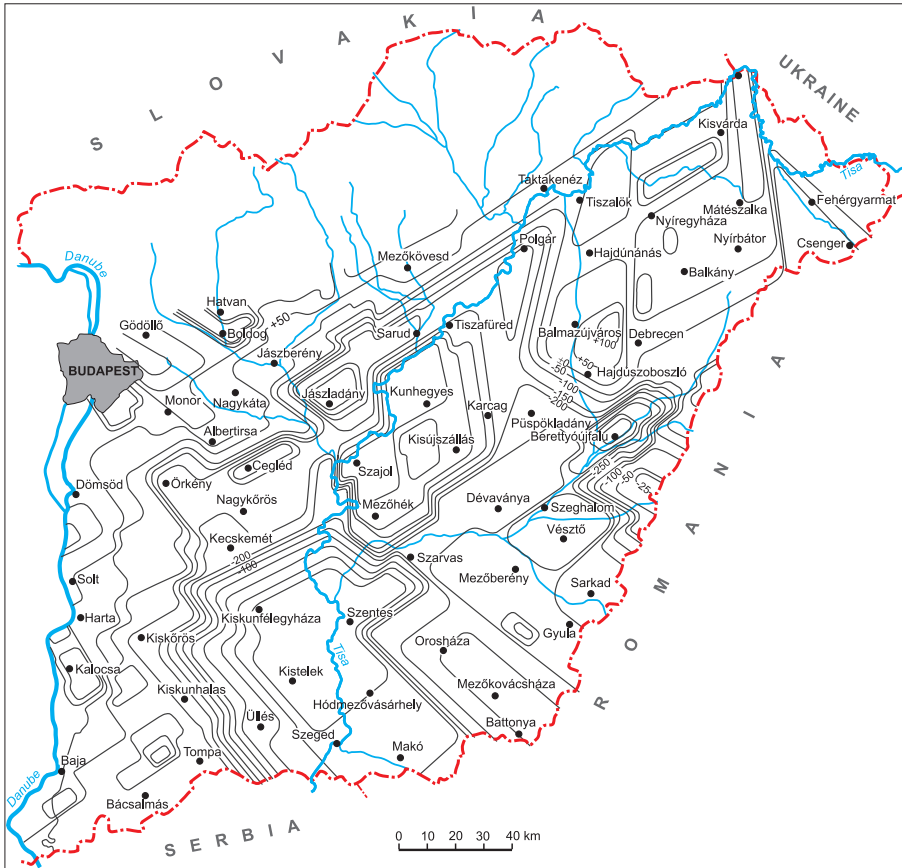


Fig. 1. Altitude of Quaternary deposits of the Great Plain relative to the Adriatic Sea level (by URBANCSEK, J.)

Sajó delta are enough evidence. There are examples from the atlas by Ptolemy (2nd century A.D.) that can be referred to. In its 1901 edition (Paris) the sheets IV, V, and IX show Marcal River to have joined Rába at Marcaltő, the Sió and Sárköz flowed together near to Simontornya; the former reached the Danube at its bend at Bogyszló. Hármaskörös had large active curves, and Maros had a double channel to access the Tisza River, partly via its southern branch (Aranka) (SOMOGYI, S. 1974).

Differences between the altitudes of terraces formed at the very end of Pleistocene and of the present surface or the thickness of recent sediments provide ample evidence about the intensity of uplift or subsidence having taken place during the past ten thousand years. The current channel of the Danube is quasi-perpendicular to this direction.



Fig. 2. Layers underlying Pleistocene sediments in the Great Plain (by URBANCSEK, J.)

A gradual increase in the thickness of the Quaternary sequence from the margins inwards the Pannonian Basin testify to the subsidence lasting from the Badenian up to the present. The Fertő Lake, Hanság, and the middle and lower Rába Valley belong to this area.

Sinking accelerated in the southern part of the Jászság in the mid-Wurm as this area represented the base line attracting water courses flowing from the Cserhát and Mátra mountains. The lower reaches of the Zagyva shifted eastward continuously and the Tarna with its minor tributaries turned into south-west and abandoned the area of Nagykunság.

Subsidence and uplift have not spread all over the plains and mountains. These movements of contrary direction occurred in larger blocs (Mezőföld, Baranya, Somogy, Nyírség etc.) or have taken place in depressions

(Jászság, Little Plain, South Tisza Basin, Körös Basin, alluvial cone of Sajó filling up a hole-like depression).

Vertical movements are known fairly well from absolute chronological investigations, so Pleistocene sediments can be dated and the rate of subsidence determined. Based on paleomagnetic studies carried out in the Körös Basin the latter has been 0.2 mm per annum for the last 2.5 million years by RÓNAL, A. (1964). Evidence of horizontal displacements however is scanty and ambiguous.

In places where tectonic phenomena were missing, only indirect conclusions were made (based e.g. on travertine occurrences, orographic and stratigraphic position of cave horizons, deformations of fluvial terraces, thickness of young deposits).

On foothills, hills and plains tectonic lines could be drawn geomorphologically with the support of the intense formation of river valleys during the Holocene, their incision, asymmetry and downcutting of recent river valleys, the extension of depressions in mountain foreland and the rate of sedimentation within them, captures, and last but not least of the variability in the topography.

The present study was aimed at identification and mapping of seismotectonic zones and fault lines active during the Pleistocene, Holocene and in historic times. Quakes in the Carpathian Basin were analysed on the basis of the map depicting the earthquakes between 456 and 2007 (TÓTH, L. *et al.* 2006; RÉTHLY, A. 1952). Place of occurrence, focus and magnitude of quakes were verified. Young seismotectonic lines, depressions and zones, supported by data and also inferred and ambiguous fracture structural elements were identified and signified in the map (TÓTH, L. *et al.* 1989).

Landscapes, geomorphology, Pleistocene fault lines and depressions in the Danube Plain and Danube–Tisza Interfluve

Micro-landscapes within the studied area have been demarcated according to characteristic landforms, natural endowments and to features of flat topography. The boundaries of micro-landscapes are running along structurally labelled lines. Micro-landscapes were indicated below with codes as of the Inventory of Natural Micro-landscapes:

1. 1. 21. Csepel Flat, 1. 1. 22. Solt Flat, 1. 2. 11. Gerje–Perje Flat, 1. 2. 12. Pilis–Alpár Sand Ridge, 1. 2. 13. Kiskunság Sand Ridge, 1. 2. 16. Kiskunság Loess Ridge, 1. 4. 1. North Mezőföld, 1. 4. 21. Middle Mezőföld (ÁDÁM, L., *et al.* 1959).

Indicating orographic relief types, platforms planated by fluvial erosion and covered by Pleistocene terrestrial deposits (typical and sandy loess, fluvial and wind blown sands) were analyzed by region (e.g. Mezőföld).

Pleistocene alluvial cones covered by Pleistocene–early Holocene wind blown and fluvial sand, and loessy sediments of various extension were surveyed on the interfluvial surface between the Danube and Tisza.

On the territory of Pest Flat (half-basin) built of Pliocene–Pleistocene–Holocene alluvial fans and dissected by fluvial valleys paleogeographic studies on the Danube Flat and within the Danube–Tisza Interfluvial meso-landscape also prove to have been productive. A geomorphological map (*Figure 3*) at 1: 200 000 scale shows landscape boundaries and lithological buildup of the high bluff along the Danube at the Mezőföld from Ercsi and Bölske down to Madocsa and over the Great Plain eastward up to Cegléd and Kecskemét with the landforms and conditions of neotectonism.

Major fault lines formed during the Pleistocene in the Carpathian Basin on the present territory of Hungary can be classified into three groups:

1. Established faults;
2. Faults with some evidence;
3. Inferred fault lines.

A fourth group of zones are represented by depressions.

Fault lines were separated according to geomorphological criteria, such as valley asymmetry; change in water flow direction and captures; asymmetry of sediment layers of identical age and of the same buildup; sharp turns of water courses and their relation to thermal springs and quakes. The fault lines visualized are listed in territorial order, their types can be identified by map representation and numbering in textual listing.

Depressions

1. Adony Depression: this embayment was also shaped by the lateral erosion of the Danube at the end of the Pleistocene and in the early Holocene. Changes in channel configuration and amplification of erosional activity have resulted from late Pleistocene movements as well (FODOR, T. *et al.* 1981; HERTELENDI, E. *et al.* 1989; MAROSI, S. and SCHWEITZER, F. 1991).

2. Kalocsa Depression: also related to the Danube structural zone. The river had reached its base line in the depression of South Great Plain.

3. Kecskemét Trench: stretches between two fault lines running in north-west to south-east direction. It is a well identifiable area on the basis of map of sediment thickness compiled from the borehole data of the Alföld.

4. Cegléd Depression: its existence is made probable by a quake focus at Cegléd and a considerable thickness of Pleistocene deposits established from the borehole data. Its oval shaped boundaries trend towards the Jászság Depression.

5. Adony–Kecskemét Depression: is probably bounded by the continuation of the fault line with the Benta Stream flowing towards the Adony

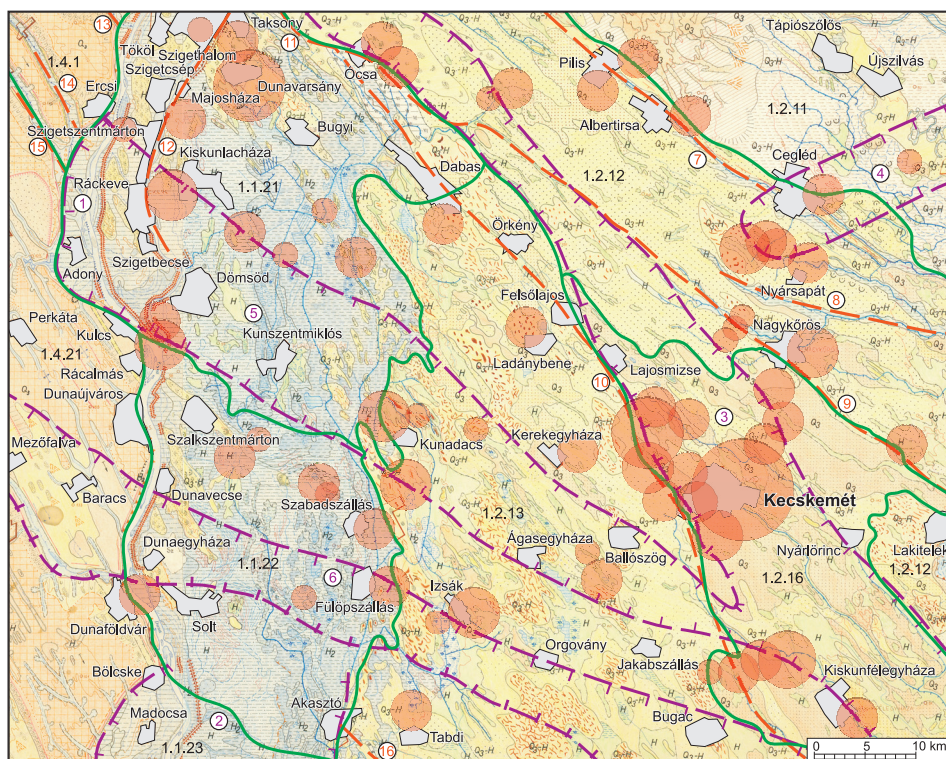


Fig. 3. Geomorphological map of the Danube Flat and of the northern part of the Danube–Tisza Interfluve (by BALOGH, J. and SCHWEITZER, F. 2008)

embayment, of the Zsámbék–Perbál fault and of the Váli-víz fault, and includes Kecskemét quake focus and Pleistocene underlying sediments. Danube was flowing on this surface during the Pleistocene.

6. Dunaföldvár–Kiskunfélegyháza Trench: is positioned by sedimentological differences between the Danube bluff north and south of the Dunaföldvár bridge, Kiskunfélegyháza quake focus and by Pleistocene sediment thickness map constructed from borehole data.

Fault lines

7. Gerje–Perje fault line: proved between Cegléd and the stream mouth by quake focus at Cegléd and inflexibility of the valley.

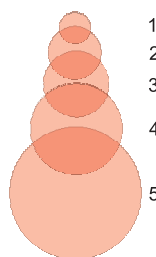
8. Körös-ér fault: is a probable line seemed to be proven by a large bend of the Tisza at Vezseny.

9. Cukás-ér fault: a section between Kecskemét and the mouth, proven by quake focus at Kecskemét and inflexibility of the valley.

LEGEND

	Alluvial sand in flood plain		Inactive steep high bluff	① Adony Depression
	Alluvial mud		Inactive steep low bluff	② Kalocsa Depression
	Alluvial clay		Blow-out and deflation hollow	③ Kecskemét Trench
	Alluvial silty sand		Erosional-derasional ridges, gentle slope segment	④ Cegléd (quake focus) Depression
	Alluvial sandy silt		Derasional terrace surface, derasional ridges	⑤ Adony–Kecskemét Depression
	Flood plain sediment undistinguished		Platform, plateau	⑥ Dunaföldvár–Kiskunfélegyháza Trench
	Peat, peat mud		Major dykes, embankments	⑦ Gerje–Perje fault line
	Boggy clay, meadow clay		Tumulus, artificial mound	⑧ Körös-ér fault line (hypothetic)
	Loess, loessy sand, sandy loess		Contour line (by 50 m)	⑨ Csukás-ér fault line
	Wind blown sand		Major heights	⑩ Budapest (Ördög-árok Valley)–Soroksár–Alsónémedi–Kecskemét fault line
	Sand blanket		Permanent stream	⑪ Ördög-árok fault line
	Stratified derasional solifluctional slope loess		Intermittent stream	⑫ Dunaharaszti–Ráckeve fault line
	Building up slopes shaped by derasional processes		Canal 1st class	⑬ Benta Stream fault line
	Deteriorating slopes shaped by derasional processes		Canal 2nd class	⑭ Zsámbék–Perbál fault line
	Low flood plain		Canal 3rd class	⑮ Váli-víz fault line
	High flood plain		Lake (permanent)	⑯ North Bácska fault line
	Oxbows and meanders in flood plain		Lake (intermittent)	
	Terrace island		Intermittently waterlogged area	
	Alluvial fan		Swamp (intermittent)	
	Gravel terrace		Quaternary landforms and surface undistinguished	
	Blown sand dune undistinguished		Lower (Early) Pleistocene	
	Point bar		Middle Pleistocene	
	Coastal dune		Upper (Late) Pleistocene	
	Longitudinal dunes mantled by loess		Holocene landforms and surface undistinguished	
	Dammed minor basins filled with loose sediment		Early Holocene	
	Alkali flats		Late Holocene	
	Minor depressions on accumulated surface		Recent	
	Minor elevations on accumulated surface		Settlement	
	Derasional valleys		1.2.21 Landscape subdivision	
	Erosional gully (dry valley)		Landscape boundary	
	Minor stream valley		Depression	
	Terraced valley undistinguished		Fault line	

MAGNITUDE



Source: Earthquakes in the Carpathian Basin (456–2007) eds. Tóth, L. and Mónus, P.

10. Budapest (Ördög-árok Valley)–Soroksár–Alsónémedi–Kecskemét fault: is a line still active at present, along which the quake of 1956 occurred with focus at Dunaharaszti (*Photo 1–2*). At the mountain section (Ördög-árok) evidence of the fault provided by orographic positions of the terrace valleys, superimposing travertines and cave horizons. In the plain section (Pest Flat, northern part of the Danube–Tisza Interfluve) deformed shape of late Pleistocene–Holocene Danube channels (terraces II/a and II/b) and a former south-east direction of flow turning into south and then south-west and a sharp turn of Dong-ér Stream add to the morphological features to confirm its existence.

11. Ördög-árok fault: connecting a row of intramontane basins in the Buda Hills; orographic position of travertines and deformed terraces testify to movements during the Pleistocene and Holocene. Its continuation is the chan-



Photo 1. Earthquake aftermath in Dunaharaszti in 1956 (M 5.6; I0 8). Some 3,144 buildings were damaged out of the 3,500 in the epicentral area. Fall of gable walls as shown in the picture were typical building damage in an area of about 37 km radius. *Source:* Geodetic and Geophysical Research Institute of HAS



Photo 2. The 1956 earthquake had the strongest effects in the epicentral area Dunaharaszti, Taksony and Szigetszentmiklós. The picture was taken at the cemetery of Taksony. Source: Geodetic and Geophysical Research Institute of HAS

nel of the Soroksár Danube branching south-eastward with quake focuses at Dunaharaszti and Alsónémedi.

12. Dunaharaszti–Ráckeve fault: indicated by the differences in geological-geomorphological buildup between the opposite banks of the Danube.

13. Benta Stream fault from Zsámbék up to the mouth: proven by the escarpment of Tétény Plateau and quake focus at Zsámbék.

14. Zsámbék–Perbál fault: having been formed since the end of the Mesozoic until recently in the western foreland of the Buda Hills horst-graben structure that has sunk to 1,500 m depth in some places. Fractures of the Mesozoic range are reflected in the surface landforms characterized by elongated asymmetric ridges, tilted plateaus, V-shaped stream valleys. The graben fault is bounded by the Zsámbék fault from the west. It should be a repeatedly rejuvenated fault line accompanied by earthquakes mentioned in historical documents (ruins of the church in Zsámbék).

15. Váli-víz fault: stretches along the total length of the water course. The different elevation of limestones of similar age on two sides of the trench between the Vértes and Gerecse mountains and the asymmetry of the valley are its indications. The quake focus at Alcsút is an additional evidence.

16. North Bácska fault: Kalocsa–Kőrösér principal canal. Geological buildup and subsurface geological structure strongly differing from that of the northern part of the Danube–Tisza Interfluvium are the proof of its existence.

Geomorphological investigations in the study of neotectonic events

In order to make the geomorphologic and tectonic models more precise it is proposed to conduct paleogeomorphic, lithostratigraphic, chronological and sedimentological investigations of the geological sediments of the Danube bluff flanking the Mezőföld.

In the course of profile construction for the exposures and their stratigraphic analysis attention will be drawn to heretofore unknown features of geomorphological asymmetry showing close relationship with neotectonics (e.g. inversion of relief).

Thematic paleogeomorphological maps are to be compiled on areas with a higher frequency of earthquakes such as those having occurred at Fülöpszállás, Izsák, Jakabszállás etc.

Surface dynamics are to be studied in sections along the Danube bluff and loess covered parts of the Great Plain. In loess sequences along with the typical loesses a cyclic occurrence of paleosols will be tackled and paleorelief is to be unfolded. Spatial and temporal analyses of fossil soil horizons might explain geologic and recent processes of landform evolution that might be important for quality assurance.

Besides the description of Quaternary sequences the research of seismites is essential. Palaeoquakes are to be studied in the environs of the medieval edifices of Dunakömlőd, Dunaföldvár and a Roman castrum, limes settlements and fortifications at Dunaújváros, where the rim of high bluff retreated by 50–250 metres over the past 1,000 years. Correlation of sediments, and survey of soil deformations needs a detailed geologic and geomorphologic profiling. Semipedolite is a type of cryoturbation that can be described in boreholes; it is an outcome of a solifluction phenomenon and probably is a proof of a neotectonic event.

Paleogeographic conditions are to be mapped according to the geologic and hydrogeological borehole cadasters and the former Pliocene–upper Pannonian surface is reconstructed on the basis of the data. There will be investigated the relationship between the surface of underlying sediments and that of the actual topographic features in relation to the frequency of the recent earthquakes and change in chloride contents in relation to the movement of the basement in the Tengellic Depression, Sárköz etc.

A survey is to be conducted on the triggers, and rate of subsidence of the buildings in relation to the subsurface paleotopography. There is a well-known connection between landforms (terraces, terrace-like forms) and neotectonic movements. Correlation analysis of terrace gravels, their spatial and temporal subdivision, and the determination of position of the terraces together with neotectonism establish links between changes in paleohydrography and landform evolution.

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Ukraine in Maps

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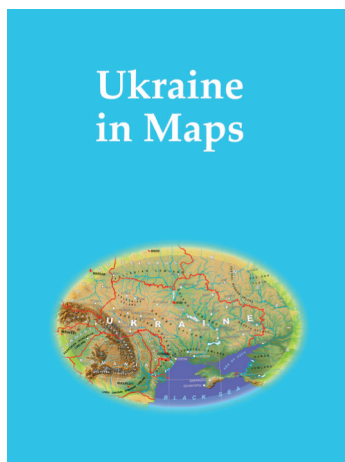
Geographical Research Institute Hungarian Academy of Sciences. Budapest, 148 p.

Kyiv–Budapest, 2008

Since the disintegration of the USSR, the Western world has shown an ever-growing interest in Ukraine, its people and its economy. As the second-largest country in Europe, Ukraine has a strategic geographical position at the crossroads between Europe and Asia. It is a key country for the transit of energy resources from Russia and Central Asia to the European Union, which is one reason why Ukraine has become a priority partner in the neighbourhood policy of the EU. Ukraine has pursued a path towards the democratic consolidation of statehood, which encompasses vigorous economic changes, the development of institutions and integration into European and global political and economic structures. In a complex and controversial world, Ukraine is building collaboration with other countries upon the principles of mutual understanding and trust, and is establishing initiatives aimed at the creation of a system that bestows international security.

This recognition has prompted the Institute of Geography of the National Academy of Sciences of Ukraine (Kyiv) and the Geographical Research Institute of the Hungarian Academy of Sciences (Budapest) to initiate cooperation, and the volume entitled “Ukraine in Maps” is the outcome of their joint effort. The intention of this publication is to make available the results of research conducted by Ukrainian and Hungarian geographers, to the English-speaking public. This atlas follows in the footsteps of previous publications from the Geographical Research Institute of the Hungarian Academy of Sciences.

Similar to the work entitled *South Eastern Europe in Maps* (2005, 2007), it includes 64 maps, dozens of figures and tables accompanied by an explanatory text, written in a popular, scientific manner. The book is an attempt to outline the geographical setting and geopolitical context of Ukraine, as well as its history, natural environment, population, settlements and economy. The authors greatly hope that this joint venture will bring Ukraine closer to the reader and make this neighbouring country to the European Union more familiar, and consequently, more appealing.



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Special paleogeographic characteristics and changes in $\delta^{18}\text{O}$ values in Upper Pleistocene deposits of the Moravian Plateau

ÉVA KIS¹, FERENC SCHWEITZER¹, ISTVÁN FUTÓ², GERGELY VODILA²
JÁNOS BALOGH¹ and MÁRIA DI GLERIA¹

Abstract

Our own new environment-discrimination proxies, which include beyond the traditional sedimentary parameters our newly introduced indices (fineness grade: F_g and degree of weathering: K_d), $\delta^{18}\text{O}$ values and stratigraphic data were used in our study to compare loess-paleosol sequences with the data of mid-latitude deep-sea sediments and ice cores from Greenland. By our data from the Červený kopec section completed with other surrounding sequences, we came to the conclusion that the section consists of the last glacial (Würm) and last interglacial (Riss/Würm) deposits.

The double paleosols equivalent with the MF_1 soils (according to the Hungarian loess terminology) can be found together only in some places. In most of the sections only some part of the complex remained (e.g. the chernozem soil in Dolní Věstonice with an age of 30.9 ky BP; the forest soil in Červený kopec – Bohunice-type culture: 40.2 ky BP). The MF_2 paleosol is situated in the lower part of the section and it was formed during the MIS 5 (Marine Isotope Stage).

Keywords: Quaternary, loess-paleosol series, paleoclimate, $\delta^{18}\text{O}$, granulometric parameters, demarcation of the layers, warming and cooling peaks, erosional gaps.

Introduction

The variations of the paleogeographic environment were investigated using sedimentological parameter values of samples from the northwestern fringe of the Carpathian Basin.

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We would like to contribute to the scientific studies of the environmental changes during the last 2 million years and to the understanding of the cooling and warming stages of the last major glaciation.

The Červený kopec (Red Hill) section (*photos 1 and 2*) was investigated in this paper due to its location in the so called "Moravian Gate". All of the variations of the North European and the Alpine glaciations could be examined in the outcrop. It is situated at the southeastern fringe of the Bohemian Massif, 50 kilometers to the one-time southernmost limit of the Pleistocene inland ice sheet and also close to the Danube and to the foreland of the glaciated Alps. The uplift of the area was caused by postglacial gradual crustal movements, so the height of the uppermost, fifth (V) river terrace is 280 m above sea level. The loess-covered terraces are the most reliable evidence of the uplifting.

The outcrop is situated on the uppermost two terraces of the terrace-system along the Svatka River (*photos 3, 4, 5*). The hiatuses are scarce, the location of the Brunhes/Matuyama paleomagnetic boundary and of the Jaramillo event is known in the series. It is important because the upper part of the long section of Krems is missing, and it consists almost only of loess-paleosol series older than B/M. In the course of the crustal movements in the last 700 thousand years vast amount of sediments were eroded. The generalized section from the series of the Krems site combined with the series of Červený kopec can be regarded the most complete loess-paleosol sequence in Central Europe.

The stratigraphic investigations of the Červený kopec section were conducted by KUKLA, G.J. (1975); FINK, J. and KUKLA, G.J. (1977); SMOLÍKOVÁ, L. (1982); ZEMAN, A. (1992) and others. The loess-paleosol series is underlain by Lower Devonian red sandstone with high quartz-content, conglomerate and arcose (*Photo 6*, DEMEK, J. *et al.* 2005).

The arcose was formed from the weathering of the granite of the Lower Devonian Caledonian Mountains with high feldspar content (>25%), its thickness varies between 100 m to few thousand meters. The conglomerate is locally overlain by Miocene limestone (SMOLÍKOVÁ, L. and ZEMAN, A. 1982). Above the pre-Quaternary strata fluvial river terraces (covered by Younger and Older Gravel) and loess-paleosol series can be found (*Photo 7*). The Younger and Older Gravel covers are gravelly sand layers, and ferretto-like soils were formed on them (SMOLÍKOVÁ, L. and ZEMAN, A. 1982). These soils can be categorized in the same group as the terra rossae, the difference is only the bedrock, which is siliceous (e.g. gravel and sand) in the case of the ferretto soils. The soils directly superimposing the gravel and sand layers were formed *in situ*, its position is autochthonous. Our sample from the uppermost paleosol is also of this kind and above it recent chernozem-like soil has formed (*Photo 8*).

We have investigated the sediment series of the upper two steps of the Červený kopec section (*Photo 1*). The significant thickness of the section is due to its location between the Alpine and Fennoscandinavian glaciated



Photo 1. The outcrop of Červený kopec exposed on the V and IV terraces of the Svatka River (Photo by Kis, É.)



Photo 2. The environment of the outcrop at the eastern fringe of the Bohemian Massif
(Source: Google Earth™)



Photo 3. Loess-paleosol series on the V terrace (the recent soil formed on a fossil pedogene horizon) (Photo by Kís, É.)



Photo 4. The location of the terrace system (Photo by Kís, É.)



Photo 5. The view from the III terrace to the river valley. The B/M paleomagnetic boundary is located in the lower part of the terrace (Photo by Kís, É.)

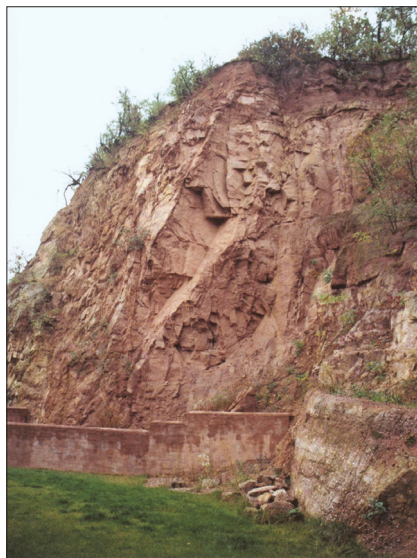


Photo 6. The underlying conglomerate derived from Devonian sandstone (Photo by Kís, É.)



Photo 7. The gravel and sand material of the V terrace (Photo by Kís, É.)



Photo 8. The uppermost loess layer of the outcrop (Photo by Kís, É.)

zones. During the glacial periods in the environs of the section three main wind directions have defined the eolian sedimentation: the westerlies in the east-west corridor along latitude 50°N, the north-westerly winds from the Fennoscandinavian ice sheet, and according to ROZYCKI, Sz. (1991) and ROUSSEAU, D.D. *et al.* (2007) the Saharan dust from south was also relevant. This last conception about the role of the Saharan dust was confirmed by the studies of VARGA, Gy. (2007, 2010, 2011).

The dust deposition was dominant under the cold continental climate of the glacial periods, while during the warm and moist interglacials pedogene processes played primary role. The section covers the last glacial-interglacial cycle (~125 ky; OXY Stage 5 – KUKLA, G.J. and CÍLEK, V. 1996, ODP-677 record – SHACKLETON, N.J. *et al.* 1990, benthic $\delta^{18}\text{O}$, the B loess/paleosol cycle – KUKLA, G.J. 1975).

The B subcycle contains three soil series (PK-I, PK-II., PK-III.; DEMEK, J. and KUKLA, G.J. 1969). The investigated section comprises the uppermost strata of the sediments covering the V and IV terraces of the Svatka River. The study was especially important, because the section is almost complete and made up from *in situ* sediments. The surrounding deposits with the same age were formed from redeposited material. The section can be used as the upper part (B cycle) of the Central European general section. From the results of our studies, we can get a fairly good overview of the paleogeographic variations in the last 125 ky.

The lowest deposits (overlying the Miocene terrace gravels) are rather old; their formation could precede the Matuyama/Gauss paleomagnetic boundary. The B/M boundary and the Jaramillo event were reached by several drills (e.g. 830 and 831 by ZEMAN, A. 1992). The B/M can be found in the loess between the PC-Xa and the PC-X paleosols. The relatively complete sequence can be correlated well with other mid-latitude sections situated on terrace-systems uplifted by crustal movements in the foreground of large mountains (e.g. Tibet). In the case of Červený kopec five, while at Lanzhou six terraces build up the terrace system (KUKLA, G.J. and CÍLEK, V. 1996).

Methods

In the course of the studies, we have compared the section of Červený kopec along the Middle Danube with the paleoclimatic data of the ice core GISP2 from Greenland. We have studied how to establish the cold-warm periods of the ice cores (estimated by isotope-stratigraphic methods) in the terrestrial sediments, and how to determine the limit of the Pleistocene glaciations.

The section was characterized by our own new environment-discrimination proxies, which include beyond the traditional sedimentary parameters

our newly introduced indices (fineness grade: F_g and degree of weathering: K_a), and $\delta^{18}\text{O}$ -values, which were not used in previous studies.

The curves of the measured and calculated values were plotted next to the section, so the data of each horizon can be promptly determined. The grain-size of the samples was measured using a Fritsch Analysette Microtec 22 laser grain-size analyzer in the Laboratory for Sediment and Soil Analysis in the Geographical Research Institute of the Hungarian Academy of Sciences (HAS). The oxygen-isotope ($\delta^{18}\text{O}$) values were determined in the Laboratory of Environmental Studies in the Institute of Nuclear Research (HAS) using a Thermo Finnigan Delta^{PLUS} XP stable isotope mass spectrometer.

Results

On the evaluation figure of the Červený kopec outcrop next to the section the following parameters were plotted: CaCO_3 content, $\delta^{18}\text{O}$ values, MIS values, sedimentary cycles, clay content, the different new and traditional sedimentary parameters and grain-size distribution values. With the comparison of these parameters with the $\delta^{18}\text{O}$ values of the ice cores from Greenland (GRIP/GISP2) we can make conclusions about the characteristics of the sediments and fairly reliable estimations about their age. All values of a given depth can be easily determined from the figure.

The following stratigraphic units were determined in the outcrop (*Figure 1, Photo 1*):

- I. 9 soil horizons
 - 1 B horizon of the recent soil (*Photo 3, 8*)
 - 2 redeposited soils
 - 6 paleosols – “Stillfried B” (*Photo 9, 10*) and “Stillfried A” (*photos 11 and 12*) pedocomplexes and the chernozem soil between them
- II. 5 loess layers (Kiss, É. 2004, *photos 8, 9, 10, and 12*).

The stratigraphic column of the Červený kopec section consist of loess and paleosol horizons of the last glacial-interglacial cycles (Würm glacial and Riss/Würm interglacial) from ~125 ky onward. The units based on its parameter values can be correlated with the similar sediments of the Stillfried (*Photos 13, 14, 15*) and the Dolní Věstonice (*Photos 16, 17*) sections.

The section of the last interglacial/glacial period lying on one of the most beautiful terrace-system of Central Europe is almost complete. The $\delta^{18}\text{O}$ values and sedimentary parameters of our own available loess-paleosol sections can be compared with the data of deep-sea sediments and ice cores.

The $\delta^{18}\text{O}$ values of the carbonates are reflecting the paleotemperature conditions during their formation. These were also affected by the waters from different sources (e.g. precipitation, the water removal due to desiccation

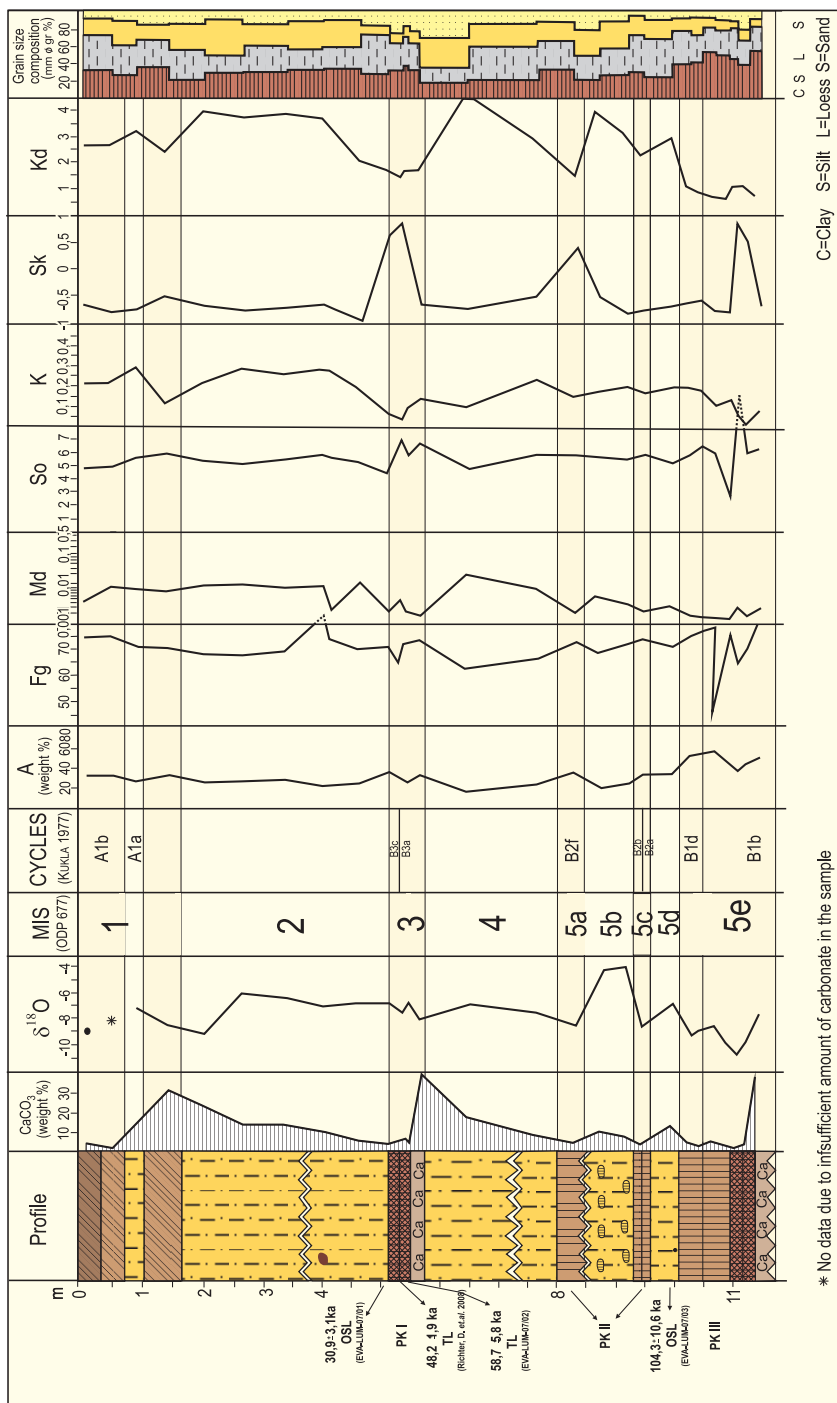


Fig. 1. Granulometric parameter values by samples from the Červený kopec section (Kis, É.). Stratigraphical analysis: SCHWEITZER, F., Kis, É., BALOGH, J. and DI GLERIA, M. Oxygen isotope measurements: FÜTÖ, J. and VODILA, G. Granulometric analyses in 9 grain-size categories: DI GLERIA, M.



Photo 9. The II step on the IV terrace (Photo by Kís, É.)



Photo 10. The fossil soil of the II step (Photo by Kís, É.)



Photo 11. Loess layers between paleosols in the substrate of the I step (Photo by Kís, É.)



Photo 12. Fossil soil in the middle part of the I step (Photo by Kıs, É.)



Photo 13. The Stillfried B pedocomplex (under the sample 22) in the Stillfried section (Photo by Kıs, É.)



Photo 14. The triple PK-III pedocomplex in the Stillfried section (Photo by Kıs, É.)



Photo 15. The lowest brown forest soil of the PK-III pedocomplex with krotovinas and traces of soli-fluctional processes in its lowermost part in the Stillfried section (Photo by Kıs, É.)



Photo 16. The brown forest soil (lower) and the chernozem soil (upper) of the PK-III pedocomplex in the Dolní Věstonice section (Photo by Kís, É.)



Photo 17. The lowest part (R/W interglacial) of the PK-III pedocomplex and the underlying Riss loess in the Dolní Věstonice section (Photo by Kís, É.)

under warm climates – DEMÉNY, A. *et al.* 2010). According to KÍS, É. (2010) the series of Červený kopec consist of the last glacial (Würm) and last interglacial (Riss/Würm) deposits, based on their values. The maxima of the isotope curves represent the coldest climate (full glaciations), while the minimum values mean the warmest phases of the interglacial periods. Our oxygen-isotope curves agree especially well with the K_d index (degree of weathering), with the clay-content, with the CaCO_3 content, with the data of deep-sea sediments and ice cores. The concordant values of the ca. 10 parameters of the stratigraphic column allow to separate and compare the units, also those which were not visible to the naked eye.

By these parameters, the differentiation of forest and chernozem soils is quite good. We can affirm the opinion of VALOCH, K. (1996) who has stated that the two parts (the upper chernozem and lower forest soil) of paleosols equivalent with our MF_1 soils can be found together only in some places (e.g. Stillfried).

In most of the sections only one part of the complex remained (e.g. the chernozem soil in Dolní Věstonice with an age of 30,9 ky BP; the forest soil in Červený kopec – Bohunice-type culture: 40,2 ky BP). According to VALOCH,

K. (1996), the lack of the lower part of the “Stillfried B” soils is peculiar in flat terrains, while the absence of the upper part is typical on the more differentiated areas, where the chernozem soil was eroded during the uplift. RICHTER, D. *et al.* 2009 have explained the ~10 ky hiatus within the MF₁ soil also with erosion, and the TL age of the lower soil is 48.2±1.9 ky, its OSL age is 58.7±5.8 ky (EVA-LUM-07/02), the OSL age of the loess above the upper soil is 30.9±3.1 ka (EVA-LUM-07/01). The MF₂ soil in the Červený kopec section is similar; its upper chernozem soil was formed during the glacial, while the lower forest soil belongs to the R/W interglacial. According to GÁBRIS, Gy. (2006), the MF2 soils in Hungary were formed in the last interglacial.

Based on our results, the Červený kopec section represents nobly the regional characteristics of the Late Pleistocene loess deposits.

Acknowledgements: The research (measurements and publication) was supported by the K63814 OTKA project (Hungarian Scientific Research Fund).

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nine supplementary maps on the reverse show the lingual-ethnic composition of the present-day territory of Hungary in 1495, 1715, 1784, 1880, 1910, 1930, 1941, 1990 and 2001 respectively. The chart here explores the quantitative and proportional changes of the main ethnic groups' population between 1495 and 2001. The series of maps displays absolute or relative ethnic majorities only in the inhabited areas of the settlements which had been mentioned in the source referred. Uninhabited areas with no permanent settlements are shown as blank spots.



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The spatial implications of urban renewal carried out by the ECC programs in Pécs

ANDRÁS TRÓCSÁNYI¹

Abstract

Cultural economy – interpreted in the broadest sense – is a phenomenon existing among the impacts of post-industrial transformation and renewal of cities. In this paper the changing and developing role of investments related to European Capital of Culture 2010 is tackled in a city, which used to have a commercial profile, later on it became an industrial centre and has recently provoked sharp debates on the further direction to follow in the frame of post-socialist economic and urban restructuring. Current tendencies and deliberate investment directions proceed towards significantly influencing the development of the city of Pécs in general and shaping its inner structure in particular.

Keywords: urban renewal, gentrification, cultural economy, ECC

Introduction

Urban renewal in its widest interpretation includes a physical, economic and community (re)development taking place during the land use change of cities. Its present practice began in the late 19th century in developed nations and entered an intensive phase in the post WWII era brought into being by the necessary reconstruction of urban districts. Generally, this kind of complex planning action becomes inevitable when the actual or former functions of a definite segment of a city cannot cope with the new challenges, therefore the demolition of previous physical structures, the relocation of housing and economic activities are indispensable. The organic adaptation to the new needs and functions takes too much time and results in many conflicts hence large scale investors, the state and/or the municipality take the initiative. While block renewals are mostly directed by investors, district renewals serving long term strategies are led by local governments. During the planning and development process the legal instrument of eminent domain is widely used

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to foster the speed of renewal projects. Large scale urban renewal is often associated with design and architectural shift of a neighbourhood, revitalising the district regularly resulting also in gentrification. Because of a massive need for capital in the course of planning and realisation a sufficient level of economic resources is essential. (REIMANN, B. 1997)

Pécs, the Cultural Capital of Europe 2010 (*Photo 1*), located in a region and country belonging to the group often characterised as transitional economies is a good example to investigate sudden urban functional and morphological changes. Under-urbanisation (SAILER-FLIEGE, U. 1999) is very characteristic, urban in its traditions and present size, functions, but with explicit signs of distorted socialist development. Throughout the past two decades the city has experienced a massive backslide regarding its economic position both in domestic and international comparison. Being positioned on a remarkable historical and cultural background, but suffering from the lack of realisable strategies for development accompanied by a dire necessity of proper infrastructure offered an exquisite situation for culture based urban renewal (TRÓCSÁNYI A. 2006).



Photo 1. Pécs at the foothills of Mecsek (Photo by TRÓCSÁNYI, A. 2006)

Theoretical context

The process of tertiarisation that started in the post-industrial stage of the highly developed part of the world arrived in East Central Europe belatedly,

in a prolonged form and with specific regional features. The dynamic development of the tertiary sector of the economy, characterised with the concurrent regression of industry, spatial and company level rationalisation, outsourcing and worldwide sourcing, modernisation of production technologies stimulated by information science, adoption of new devices by consumers and users and demographic transition, has brought about the reduction of producing sectors, and the upgrading of non-material type of goods and possessions. However, this widely familiar process of restructuring can rather be interpreted as the emergence of a new economic paradigm, thus the service sector (in the broadest sense) went through an intrinsic differentiation and transformation, giving birth to the quaternary sector that is based on information and includes higher education, scientific, research, intelligence, organisation, management and tourism activities. This fourth sector of economy has gained increasing importance in the highly developed regions, with its non-material character (information, idea, knowledge, competence, talent, etc.) bringing to life new attitudes and structures both in production and consumption.

The footprints of social and economic structural transformation can be followed both in rural and urban areas, although the remarkable structural changes have taken place mostly in cities. Central Europe's eastern part can be distinguished from the more western and more fortunate major regions mostly on the basis of the fact that although Central Eastern Europe lies in the mainstream of social and economic development, yet the effects arrive from the countries of the core with a delay, often in a more or less distorted form. After the change of the political regime, serious problems were loaded onto Hungarian cities, caused by the fact that the economic structure had not been transformed. In addition to this, there were also phenomena like the settlement consequences of the transformations, the temporary suppression of community level planning, the almightiness of market, and the striking manifestations of physical and moral amortisation of the building stock caused by the fact that important investment projects had not been implemented amidst the shortage of funds. In other words: post-industrial and post-socialist impacts piled up on each other, creating a specific structure of transformations. This process was described and modelled by a number of researchers, focusing mostly on larger cities, first of all on regional centres. Kovács, Z. (1999) made a distinction in the model of post-socialist urban transition between the effects of political versus those of economic transformation, defining also the termination of central planning and the onset of new supremacy of market regulation, as well as the transformation of the two most important segments of the process, i.e. labour market and real estate market. These are the stages in the described model, leading to the formation of a new urban order.

When looking at post-socialist urban transformation, SAILER-FLIEGE, U. (1999) emphasised five basic factors: the spreading of neo-liberal ideology,

deindustrialization and tertiarisation appearing as an aftermath of economic transformation (*Photo 2*), the social restructuring that accompanies social inequalities, the low tide in urban planning, and the regression of the roles of the state. According to this author, post-socialist cities have retained much of the compactness of their predecessors, thus the particular functional zones still show a relative uniformity. An important factor is the growth of areas occupied by the service sector, not only through the expansion of CBD, but also – through deconcentration processes – in formerly homogeneous residential zones. Besides several factors of the transformation that have been specified by a number of authors SAILER-FLIEGE underlines the formation of industrial brown fields and their unsolved problems.

The formation of considerable differences in income and social status typical in post-socialist societies launched a process of intensive segregation, and contributed to the revaluation of certain districts of cities. The formation of slum- and ghetto-type of districts again became characteristic features of these urban environs (LADÁNYI, J. 1993; KOVÁCS, Z. 1998). It is not only the abandoned and neglected industrial facilities that have started to convey problems for urban development and management, but also the decaying residential sectors that are also under-utilised in a certain sense (LICHTENBERGER, E., CSÉFALVAY, Z. and PAAL, M. 1994). Districts located in easily accessible quarters of cities or



Photo 2. Shopping centres and malls invaded the former industrial zones of Hungarian cities – Árkád Pécs (Photo by TRÓCSÁNYI, A.)

outskirts are often considered as possible development venues of transformation based on cultural industry.

The growing importance of the production of non-material values is an important distinctive feature of post-modern or post-industrial development. There is no scientific consensus that could give guidance in deciding where exactly the boundaries of cultural economy are running, or which are its well-defined constituents or subsets. Not even the concept of cultural industry has been agreed in: according to the definition put forward by PRATT it is actually a produce or performance expressed in arts or literature, and the reproduction (and dissemination) of these in the form of books, journals, films, TV and radio programmes and data storage media, and also activities that interlink various branches of art (including promotion and advertising). Also included are the creation, distribution and broadcasting of the materialised products of printed and electronic media, as well as the operation of museums, libraries, theatres, galleries or even night clubs (PRATT, A.C. 1997).

ENYEDI, GY. (*et al.* 2005) defines two major groups, namely that of cultural services and that of cultural products. SÜLI-ZAKAR, I. *et al.* (2005) even put forward complex interpretations whose main dimension is the role fulfilled in competitiveness, whereas RECHNITZER, J. (2007) approached this subject from the analyses of supply and demand. According to this interpretation, cultural economy is a complexity made up of cultural infrastructure (TRÓCSÁNYI, A. and TÓTH, J. 2002) and the programmes offered and consumed in these facilities (monuments, museums, exhibitions, theatres, open-air performances, concert halls, festivals, community centres, movies, libraries, journals of literature and culture, media). Another segment is also closely associated with this field – i.e. the one that is normally defined as knowledge economy, in order to distinguish it from the former, and consisting of special elements of cultural institutions, mostly the intellectual and economic potential represented by higher education institutions and research facilities (du GAY, P. and PRYKE, M. 2002). However, because universities have other outstandingly important roles as well in distributing and promoting culture, besides their education and research duties *sensu strictu*, this sector can also be grouped together with cultural economy. The concept that cultural economy is a complex of services and products associated with culture seems justified, as well as the idea that the spatial projections of cultural economy should be analysed along the lines of production, trading and consumption of cultural functions and products.

The main reason why it is worth dealing with the importance of cultural economy in the revival of towns is because it is a genuinely urban element, associated with the essence of the urban issue. This recognition and such intentions came earlier in the leading countries of the globalised world, and have lead to success in many cases. WEHRLI-SCHINDLER, B. (2002) not just emphasised how a valuable element culture can be in a city as a seat for a company, but also

underlined factors that play significant role in the revival of certain sections of cities, e.g. the influence of grand cultural projects or building museums, exhibition facilities. Providing an analysis of the issue through the example of London (Tate Gallery), Paris (Pompidou) and Bilbao (Guggenheim), she mentioned similarly successful projects in smaller scales as well (Basel, Bregenz, Luzern), with a detailed introduction to the development of a complex cultural and amusement district, i.e. Zürich West. There are also a number of other examples: there have been quite a lot of recent urban renewal projects both in Europe (MediaPark and Rhine harbour, Cologne; International Cultural Centre, Avilés; Fjord City, Oslo; Park of the Nations, Lisbon; Bijlmermeer, Amsterdam) and at global levels (Alexandra Renewal Project, Gauteng, RSA; Cheonggyecheon, Seoul; South Brisbane, Queensland) in which the creation of public spaces for community use was seen to be the key to revival and development. The only question remains how these factors and directions can be identified and brought to life in the case of a Hungarian city.

The factors that accompanied the transformation of post-socialist cities did not favour the spreading of cultural urban rehabilitation. Although deindustrialisation and economic structural transformation together meant that definite functions were suddenly lost from many of the urban spaces, resulting vast under-utilised areas in cities, many times quite close to the centre, thus offering theoretically excellent grounds for the settling of cultural economy. However, there was a highly significant inhibiting factor that strategic urban planning and related implementation were at a very low, downsized level and efficiency.

Private capital – where it was interested – became the engine of transformation, and development had elements that were early-modern rather than post-modern, recalling the world of free competition capitalism of the 19th century in many respects. The feeling of urban spatial discontinuity and patchwork city transformation was further strengthened by the fact that the new projects were mostly green field investments. The symbols of the new economy were malls, shopping centres, logistical bases and modern industrial plants, all built rather on the fringes of cities, along main roads leading into the urban areas. Even the rehabilitation projects of inner urban spaces went on in an isolated way, each of them forming separate worlds, creating their own micro-environs through the establishment of new junctions, pavement reconstructions, neatly trimmed lawn, new planted trees, fountains and outdoor furniture, thus intensifying the collage-character of cities in transformation (LUKOVICH, T. 2001).

Culture and cultural economy did truly suffer the shrinkage of state functions in all fields. Culture did not offer rapid and secure rates of return for private capital, thus after 1990 both the state residing in a financial crisis and the local governments that partly took over governmental roles were rather

just onlookers of the deterioration of still existing cultural infrastructure, and did not undertake or have influence on important investments in this field. When talking about the early 1990s it is more reasonable to mention just cultural sector/sphere rather than economy, because the “industrialisation” of this sector started only hesitantly. For cultural economy to be able to become determinant in the life of a city, its transformation is essential, under circumstances amidst which culture is not only a service supported and sustained by the state and local governments, but instead a special type of market where competition can evolve in the presence of real supply and demand, thus forcing the actors in this sphere to provide high-quality services. As a summary, cultural economy in Hungary can be described as still standing on a weak ground. Just to mention a few of the problems: the mass of discretionary incomes is meagre, and there are difficulties also with the availability of sufficiently differentiated supply (and sometimes of demand). Under such circumstances, even the investments of the period after the late 1990s, which became increasingly common (often with motivations of prestige) and deliberately symbolic, have remained rather isolated.

In many respects, those said generally in connection with the transformation of cities and cultural economy cannot be applied to Hungary as the aforementioned “critical mass” of solvent and selective demand and differentiated supply is missing. The regional centres in Hungary with their 150–200 thousand inhabitants, situated on the level of urban hierarchy second to the capital are deemed middle-sized cities at a European scale, in which (as it will be illustrated below by the case of Pécs) cultural economy has only a potential to be determinant, and cultural investments are rather running ahead instead of truly being demanded by local needs.

The resources of Pécs

The city of Pécs is far from the level of global cities both in its size and in its relation systems, and those cities are centres for the globalised and uniformed culture as well. Being the centre of the South-Transdanubian region, Pécs is the fifth populous city in Hungary, and the largest one (apart from Budapest) in the region west of the Danube. However, measured at an international scale it is a middle-sized city (EPSON 2005) with its 157,680 inhabitants in 2010. Although the city is endowed with universal values – for example it has been listed as a World Heritage Site and elected as European Capital of Culture for 2010, and its international regional relation system is well beyond what would be expected for its size and economic potential, yet the great global challenges have only secondary influence on forming the inner texture of this settlement (FARAGÓ, L. 2010).

Pécs performed the role of a regional centre for centuries in trade, institutional and cultural aspects, but could develop into a big city only as a result of the industrial revolution, by taking advantage of the extractable minerals in its environment (coal and later uranium ore). Besides, advanced and diversified light and food industry were also present which together ranked Pécs among the highly developed cities of the socialist Hungary in the 1970–1980s. However, the structural transformations suddenly wiped away mining industry which was an important source of income for many people, and also left a wide, empty track among light industrial plants. An even deeper economic and industrial crisis had struck the South-Transdanubian region which acted as a hinterland for Pécs, and made catching up even more difficult.

Pécs has always liked to define itself as a cultural – or even multi-cultural – city (German, Serb, Croatian and Bulgarian minorities have also lived here in historic co-existence), and the town even has a unique sub-Mediterranean character (AUBERT, A. *et al.* 2007). It is quite difficult though to find the genuine historic basis for such a cultural role: in the period when culture was becoming institutionalised at large scale in the 19th century, Pécs did not belong to the leading group of Hungarian cities. Debrecen and Szeged, and even Kolozsvár (Cluj), Kassa (Košice) and Pozsony (Bratislava) (the latter three belonged to Hungary at that time) overweighed it in size, roles, and the number and importance of cultural institutions and functions (BELUSZKY, P.–GYÖRI, R. 2004). Furthermore, the civic traditions of Pécs seemed much less pronounced than those of a number of West-Hungarian cities. In this sense, Pécs started to challenge the rivals after 1920, when Hungary, forced behind new state borders by the Treaty of Trianon, lost its most important regional centres. The establishment of the new (cultural) spatial structure within the new borders, e.g. the settlement of institutions of higher education, the creation of museums, etc. persisted throughout the 20th century, and that process, provided the opportunity for Pécs to catch up with the rest of the Hungarian big

cities. However, until 1990 it has remained primarily an industrial centre that ensured higher-than-average living standards for its citizens, regarding indicators such as average income. The dual (schizophrenic) city image (mining, industry versus culture, history and traditions) that had developed by the 1980s is well represented by the official coat of arms of Pécs in the socialist times (Figure. 1).

The mining city unquestionably had a very strong cultural character with its almost thousand years old bishopric, the oldest university (founded in 1367) in the country, the first Hungarian public library (1774), a theatre founded in 1800 presently

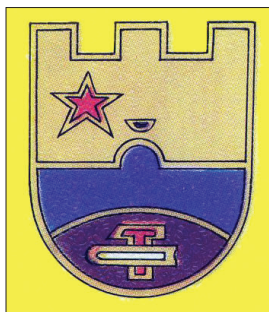


Fig. 1. The coat of arms of Pécs in the socialist era

with five separate companies, a local newspaper first published in 1848, and its 14 museums of nationwide reputation in 1990. Not only the cultural infrastructure was present, but also the cultural output of the city had expanded in the course of time: the Pécs Bauhauslers (1920s), the cultural quarterly *Jelenkor* (1958), the Ballet Pécs (1960), the neo-avantgarde artists (1970s), and strengthening intelligentsia of the forming university city (increasing enrolment of students, assisted by almost 2,000 academics and researchers) had shaped a remarkable cultural character by 1990.

The rebirth of the cultural function after 1990 was partly relative: parallel with deindustrialisation, the weight of the existing cultural sector and services became more significant. This was further enhanced by the fact that the University of Pécs integrating other institutions of the city was successful in taking advantage of the nationwide expansion of higher education, and became the university with the highest number of students (31,000 in the peak years, presently 28,000) in the country, and the greatest employer (more than 6,000 employees in 2010) in the region of South Transdanubia. Another factor rests with the self-definition of the city, i.e. in the approach by means of which Pécs – maybe not quite consciously – has tried to get rid of the prolonged crisis. Unlike many other Hungarian cities that have appeared to be dynamic in recent years, no strategy based on external investments was practiced in Pécs, for the sole reason that financially potent companies did not show up in the city, apart from just one (electronics industry). Obviously, some sort of endogenous strategy had to be sought after, and in finding it an ever growing role was deliberately assigned to cultural heritage, cultural industry and culture-based economy.

Some of the most important stages of this process were as follows. After an unsuccessful attempt to bring the entire multi-faceted historic downtown area under international protection, Pécs was finally listed among UNESCO's World Heritage Sites in the year 2000, owing to the Early Christian Necropolis. In preparation for the EU's 2007–2013 budgetary period, the Pécs Pole Developmental Strategy was formulated and approved in 2005, in which the development of the city is envisaged as resting on three pillars (cultural, health and environmental industry), with the university being strongly involved in all three fields. After an extensive domestic political debate, rivalry and international contest finally in 2005 Pécs was awarded the title European Capital of Culture 2010.

A common impact of these three actions was that they all upgraded the role of culture in revitalisation of the city. The status of World Heritage Site has meant that Pécs gained some advantage in the competition on the tourism market, and its name (brand) can become more familiar, with its world heritage attractions being internationally qualified and renowned. Winning the title did not bring about an effective breakthrough either in the numbers

of visiting tourists or in the related economic activity types, nevertheless it became the basis of a relatively important rehabilitation project aiming not only at displaying the World Heritage Site, but also at providing its environment an architectural renewal. In case of the Pole Programme, the main objective was to transform the city of Pécs into a hub that bears significant radiation over and attraction within the surrounding South-Transdanubian region. The programme became known for its mosaic-like character of developmental concepts, yet it was conceived at strengthening the connections between knowledge-intensive sectors of economy, university R&D capacities and the business/entrepreneur sphere. Originally, its cultural pillar had high emphasis on the settling of film and movie industry and on a number of other measures that would have aimed at creating an atmosphere required for the settling of creative sectors. The Pole Programme however has been somewhat shaded out by the European Capital of Culture 2010 project, partly because resources for the former were re-allocated so that the ideas formulated in the latter could be financed.

Overview of functional morphology

The urban morphology of Pécs is mainly determined by physical factors: it is located on the foothills of Mecsek, with its historic centre developed on the fluvial deposits of streams. In the early years the northward and southward expansion of the city was limited by the northerly located elevations and the southern swampy areas. The east-west axis is formed by both the Pécs basin and the transit routes crossing the city. Historically the economy of the city was based on wine cultivation on the southerly slopes, while craftsmanship developed using the water resources of streams coming from the karst reservoir of the hills. Pécs was surrounded by a group of villages either located in the valleys of the north or the flat segments of the rolling southern surface. This structure was fundamentally deformed by industrial development of the 19th century.

Coal mining at the northeast outskirts at the beginning was only limited, while with the appearance of Danube Steam Navigation Co. in 1853 the excavation reached industrial scales. Firstly, the northeast mining districts started to develop rapidly, on the other hand the company opened a railway line transporting the raw material to the Danube ports, which attracted the town to the south. Economic progress of the late 19th century stimulated the expansion of the settlement with zones of manufacturing as many new industrial estates were founded, including porcelain works, and also resulted in housing developments for the growing population. Industrial character was reinforced in the post-war era, melting in morphologically the coal-mining

suburbs supplemented by the westward expansion of uranium ore research and mining from the early 1950s. As the new mining pits were located out in the western peripheries of the fast growing city, additional housing estates were erected from the outskirts towards the centre. Small villages were integrated in this part of the urban expansion too, while the functional change enlarged Pécs to the south during the 1970s. The lowest territories between the centre and the vast housing areas provided space for industrial and commercial activities near and along the railway line. Urban land use pattern had become fragmented even by the end of the socialist time, which was further strengthened by the post-industrial transformation taking shape rapidly after 1990 (*Figure. 2*).

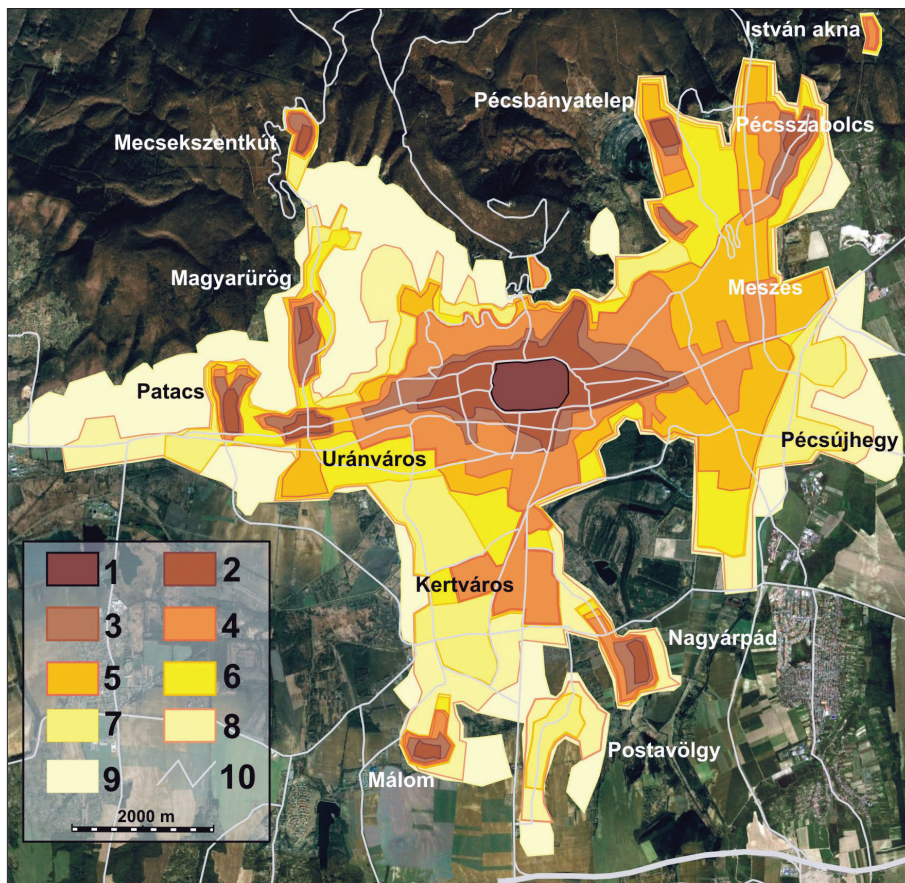


Fig. 2. Spatial development of Pécs (compiled by TRÓCSÁNYI, A.). – 1 = Medieval City; 2 = 1864; 3 = 1880; 4 = 1943; 5 = 1957; 6 = 1967; 7 = 1980; 8 = 1990; 9 = 2010; 10 = Main thoroughfares (2011)

Certainly post-industrial economic transformation also left its (spatial) footprint on the functional morphology of Pécs. The previously rigid functional zones started to change their character in different pace and time. Generally: Pécs has lost its pivotal position among Hungarian regional centres, the city of well paid miners and reputed cultural values had turned into a pole of unemployment, a community of mismanagement, a place with poor accessibility and obsolete inner infrastructure continuously and sorely missing capital investment.

The massive deindustrialization (the closing of both coal and uranium ore mines), the decrease of industrial output and the postponement of reindustrialization left substantial extensions of brown fields all over the city. Many of them were located along the railway line, some spotted the inner blocks, while immense segments could be found at the north-eastern peripheries. Both industrial decline, and the gradually diminishing and eventually dissolved military functions had provided under-utilised estates. Out of the three large military bases only one preserved its former function and presently is used by police.

Luckily, the deindustrialization was accompanied by the growing (importance) of higher education: the rapidly increasing figures of student enrolment, the (partly) successful internationalisation of training programs provided a significantly strengthening market demand both in housing and consumption aspects. University of Pécs had become the largest employer within the region by 2000, its budget is certainly comparable with that of the municipality. According to previous surveys (Gyüre, J. 2007), the expenditure of students only on accommodation calculated with an average price (HUF 24,000/month) and a ten-month period makes up an annual income of about HUF 1.15 billion for the city. The university was involved in a successful property exchange with the state owned companies, the municipality and the exchequer in the early 1990s, legally and physically integrated formerly separate organizations (schools, hospitals, institutions), initiated real estate reconstructions and developments giving new fashion to some districts and a leaving a massive footprint on the entire city.

Housing areas and estates have also experienced a substantial transformation in the past decades. The formerly young dwellers of housing estates either has moved to more lucrative locations within the city and the suburbs of Pécs, or just has grown old in their original location. The dwellers of housing estates show a new, at least triple character presently. Aging, generally retired original population is supplemented by low income couples moving into the cheaper districts, while the massive figure of university students provides for a growing demand on the apartments to rent. Therefore, the surviving functions and services of housing estates are not able to satisfy the current need of the present inhabitants.

Although the city management recognised the historic heritage and marketing elements and possibilities of the downtown, but its central business functions weakened significantly, the crowdedness continued to grow. The huge brown field supply has continuously provided areas for retail de-

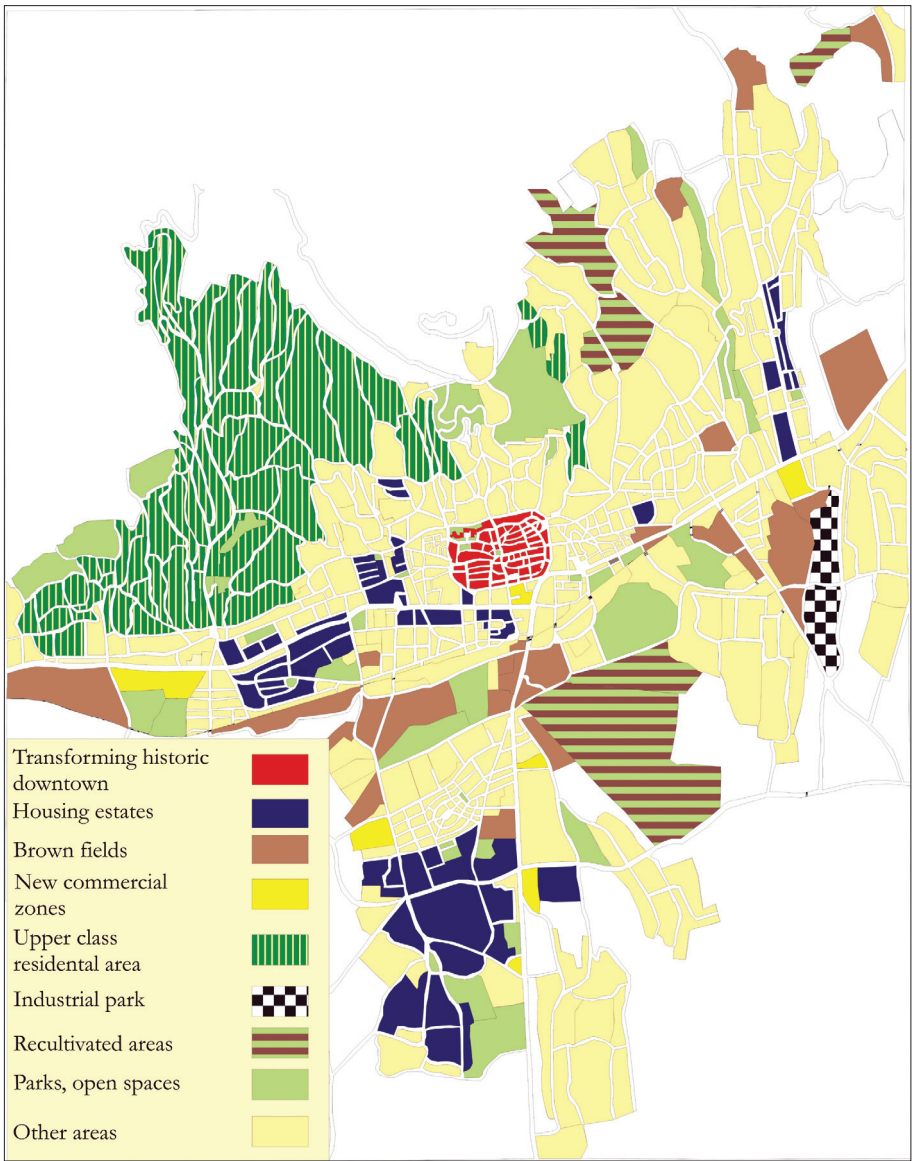


Fig. 3. Types of spatial transformation in Pécs (compiled by PIRISI, G.)

velopment, new shopping centres and malls were opened at the peripheries of the city which did not help the revitalisation of the inner city functions. Nevertheless, the municipality of Pécs successfully managed the renovation of some heritage elements and eventually became entitled the UNESCO World Heritage Site for the Early Christian Necropolis. Functional change of the historic centre took place gradually and slowly: traffic control, entering and parking restrictions, pedestrianisation started to be introduced as early as 1989, but the physical transformation of streets and part of public spaces were completed only in 2010.

Parks and recreational areas have also painfully experienced the lack of funds and the altered economic focus of the city. Financial resources for the maintenance of the green areas were missing and policy turned out to be forlorn, their accessibility remained weak, and they hardly fit properly into the urban texture of the city (*Figure. 3*).

The borderless city project

The Borderless City is a slogan invented by local intellectuals for the European Capital of Culture project proposal, offering several connotations: social, economic, geographic etc.. Firstly of course, it refers to the Balkan region, towards which Pécs has traditionally represented an important gateway. In the course of history it happened several times that this orientation was more important than the ones towards the national capital or hinterland. On this basis, with the help of infrastructural investments and grand cultural events Pécs intends to regain its regional attraction, including the inevitable cross-border links. On the other hand, it also means the deliberate removal of virtual (mental, image) and physical barriers or borders within the city. These borders have been created either by intention or by coincidence throughout the past century as a consequence of the altering intensity of urban development. The texture of Hungary's fifth largest city is more than heterogeneous: founded by the Romans, its somewhere medieval or Turkish flavour, and generally Mediterranean atmosphere is mixed with heritage elements of modern and Art Nouveau architecture surrounded by vast housing estates of post-war development spotted by rundown industrial brown fields.

The aimed fundamental principles according to the proposal were to promote the utilisation of the city's economic potential and the development of the creative industry and (cultural) tourism. Investments had to be made into the foundation of cultural institutions to enable Pécs to be compatible with those in the European Union to fulfill the targeted international functions. The developments had to be closely connected to the fundamental cultural tendencies and heritage of the city; furthermore, they had to be related to these

functions. Investments were aimed to help to revive the urban character of individual city quarters, to carry out social revitalisation of neighbourhoods, involving local ideas in development, encouraging talented young citizens to stay in the city, and help Pécs to regain an international regional impact (TAKÁTS, J. 2005).

The project can be approached from two different dimensions: on the one hand it focused on investments in cultural infrastructure – i.e. on (re)constructions –, on the other hand an attractive program for 2010 was overseen. Certainly the latter will not be tackled in detail but the spatial implications of the program sites will be discussed briefly. From the very start the investments were based on five pillars i.e. on the following key projects: Grand Exhibition Space, Music and Conference Centre, Regional Library and Information Centre, Revival of public squares and parks, Zsolnay Cultural Quarter (*Figure 4*).

When looking at the key investment sites of the cultural capital project, one can recognise the apparent intention to interlink sections of the city separated by industrial blight zones, and to attach areas formerly existing in the city as *terrae incognitae* to cultural spaces. Such neglected areas sometimes appear very boldly in the urban structure: in the case of Pécs, wedged in between the traditional and the modern but outdated districts of the city. The new strategy intended to remove these inner boundaries as well, creating a uniform, post-modern urban appearance. The ultimate goal, of course, is the long-awaited structural transformation i.e. the creation of such a cultural economy which is capable of filling in the empty space that was created as a result of industrial decline and of transforming the city into a regional centre in a broader, cross-border sense.

The majority of the strategy is to be implemented in the form of five key projects, three of which was to be carried out within a single coherent spatial unit, in the zone of city centre edge and an unappealing former inner industrial belt. The creation of the Zsolnay Cultural Quarter, presently the largest brown field cultural investment in Central Europe (marked A on *Figure 4*) has been a central element of the project proposal. The factory itself is an emblem of the city: symbol of the gone, but still memorable development of the modern age (TAKÁTS, J. 2005). Its (former) products (eosin-dye and piro-granite tiling) decorate buildings from Paris to Zagreb, from Pécs to Budapest. The heritage management, but also post-modern style oriented reconstruction of the complex of great industrial traditions can bring new energies to the easternmost periphery of city centre. Thus, the experiences from recent years have shown that industrial production on its own cannot sustain the factory any longer; production will be limited to a manufacture scale, providing an insight by the public to traditional industry. The invented new functions, in line with the post-modern concepts of urban planning are mixed: there will

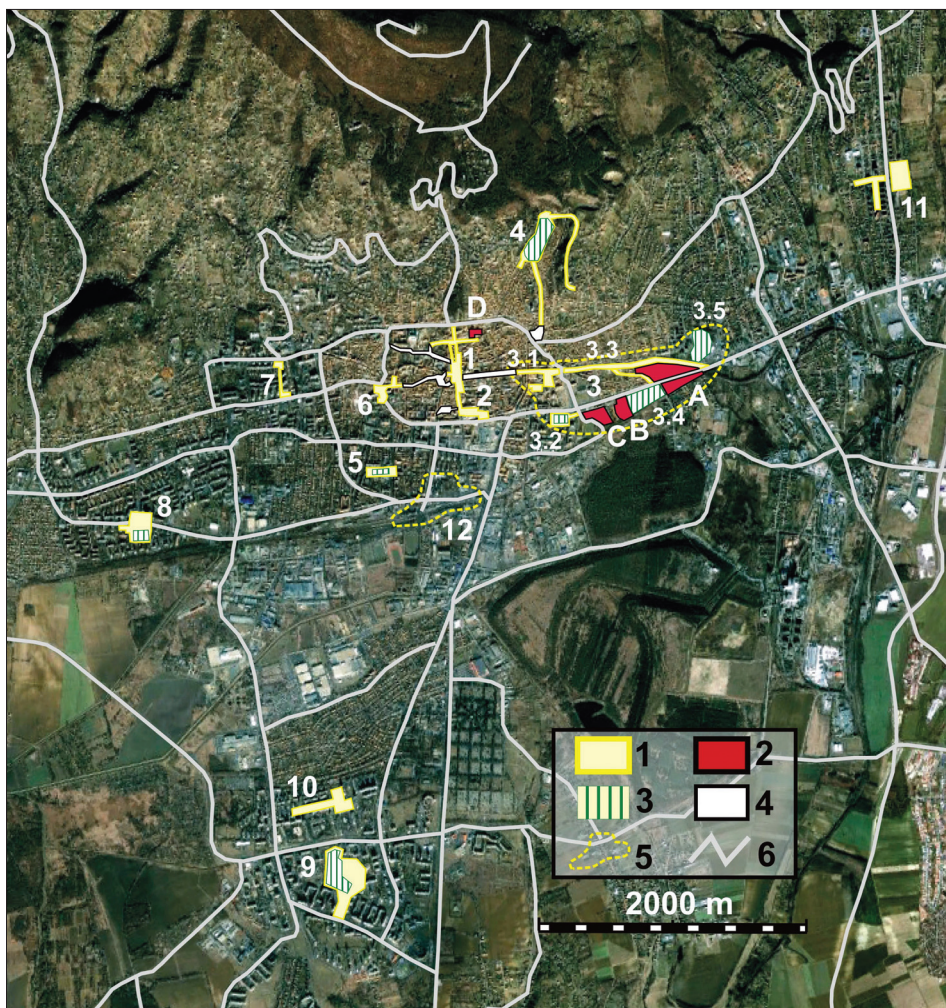


Fig. 4. Investment sites of the ECC project (compiled by TRÓCSÁNYI, A.). – 1 = Revitalised public spaces; 2 = Key projects (institutions); 3 = Revitalised parks; 4 = Previously renewed sites of the inner city; 5 = Other important districts of renewal; 6 = Main thoroughfares (2011). For the explanation of letters A through D and white numbers 1 through 12 see the text

be an industrial historic theme park installed in the building complex with a park in its inner court and with Art Nouveau features, as well as an incubator house, an artists' camp and exhibition facilities for the Faculty of Arts, restaurants and hotel facilities. The planned functions (creative industry, university facilities, entertainment, museums and heritage elements) are to provide a

full day program for the visitors developing a new tourist attraction site of the city. This large scale project (both in capital investment and extension) is intended to give a drive to progressive development in the neighbourhood and provide basis for the further cultural transformation of the district. Along with the conference centre and concert hall complex it can enable the city with higher reputation via hosting profitable international events of cultural, creative and conference tourism. Although the cultural year passed and some elements of the site are working, the entire complex is to be opened for the public by the end of 2011.

Next-door, easily accessible to the development site of Zsolnay Cultural Quarter an impressive 11,000 m² Music and Conference Centre (marked B on *Figure 4*) was erected in the framework of the project. Before its opening in November, 2010 the city had no venue either for larger conferences or concerts with sufficient standard or capacity. The new concert hall has placed Pécs on the musical and scientific conference map of Europe, making the city a hub in its international region. The flagship of investments presently houses the Pannon Philharmonic Orchestra and the offices of Pécs Cultural Centre. The concert hall with a capacity of almost 1,000 seats can host classical, jazz, world and folk music, pop concerts, as well as film festivals and conferences. Smaller events can be organised in the two bigger and two smaller conference halls with a capacity of 350 and 40 persons each, while halls of ballet and music rehearsal are also available for the artists. The centre costed 7.9 billion HUF and seems to be one of the most successful investments at the moment: 189 larger concerts and programs are scheduled for 2011.

The walk from the Zsolnay site to the city leads along the Regional Knowledge Centre (marked C on *Figure 4*) – originally named Regional Library and Information Centre – which attracts the view next to a university hostel. Having the oldest public library in the country Pécs has a strong tradition of offering a wide range of collection of readings, not only for the university audience, but for the general public. The prideful expansion during the past decades has led to reaching physical limits of several collections, thus none of them could develop their services according to the changing modern needs. With the completion of the new centre the former collections of the County, City and University Libraries are held under a unified catalogue structure providing access to all materials for all registered users. In addition to its IT based services presenting one of the largest stock and variety of books, several reading rooms are available; the new centre has a multitude of computer workstations, databases and access to the internet. With its seven day per week opening time, it is truly visitor-friendly, offering services not only for the academic public, but also for all city dwellers from different age and interest groups. The combined investment of the county, the city and the university amounted to 4.9 billion HUF.

Pécs is well known for its wide range of museums both internationally and domestically, spread all over the city, but mostly concentrated along Káptalan Street (often called Museum Street) in the northern part of the historic centre. These collections are fascinating and some of them are quite unique, but the city had no capacity before to receive larger temporary exhibitions. In the framework of the cultural capital project the renovation of Museum Street and its units (in eight different buildings) was completed, while this artistic corner (actually axis) was extended further to the east. The fine baroque architecture of the former County Assembly Hall was also renovated and the building extended by an additional new wing now called the Grand Exhibition Space (marked D on *Figure 4*). The appealing mixture of historic and modern structures can accommodate larger transit thematic exhibitions more flexibly while the offices and research labs, storage capacities of the County Museum were also enlarged and improved. This investment can improve the artistic life of the city with better and larger capacities for exhibitions and can boost tourism, as Museum Street starts from the most visited and reputed tourism attraction of the city: the cathedral and the Early Christian Necropolis. The eastern extension and pedestrianisation of the street to the direction of the Grand Exhibition Space lead and attract tourists to other, formerly neglected places of interest districts of the city. The total investment for this project was budgeted to 3.5 billion HUF.

The remaining, fifth project was the transformation of the city's appearance in minor details but with fundamental spatial effects. It included the physical reconstruction and revival of public squares and parks (marked 1 to 12 on *Figure 4*), and the total renewal of the downtown area. A central element of this project is the pavement, pedestrianisation therefore the total functional change of the emblematic Széchenyi Square (*photos 3 and 4*).

The site originally, historically functioned as a market place for centuries, but reconstruction in the early 1940s transformed it to a mixture of a transportation hub and a public space. These two functions were physically separated by balustrades, however increasing traffic played down almost totally the social, agora role of it. Through-traffic control did not solve the problem, the historic centre and some of the adjoining streets had turned into a polluted, over-crowded and partly illegal car park by the turn of the new millennium. The reconstruction focused on the revival of the lost social function, with full pedestrianisation, and the implementation of new fountains and water pools, the square was given a new atmosphere when it was returned to the city dwellers and tourists. It was moreover inevitable to link up the tourism attraction sites to one another providing an easily accessible pedestrian district, with friendly (Mediterranean) atmosphere. The historic east–west axis of the city was furthered to the direction of the new investment sites described above, but the north–south extension was also enlarged with



Photos 3–4. The changing character of Széchenyi Square: parking function in the 1980s and the public space in 2011 (Photos: Archive Pécs, MÁNFAI, GY.)

street reconstructions. Another large open place (Kossuth Square) with less historic connotation lost its surface parking function during the transformation: an underground garage was constructed, freeing additional space for public use (*photos 5 and 6*). The nicely renovated area now can house festivals and concerts, smaller seasonal markets. The philosophy of the cultural capital emphasized that the sense of urbanity largely depends on how public spaces are used. The original monofunctional utilisation had to be altered according to the changing requirements of a given area, preferably developing in a multi-functional direction. The historic development of Pécs resulted in a patchwork structure of the city where different districts not only showed distinct urban



Photos 5–6. The changing character of Kossuth Square: bus station in 1970s and a public space with underground car park in 2011 (Photos: Archive Pécs, MÁNFAI, Gy.)

characters but many of them were separated from the others physically and also socially. The concept of borderless city aimed to pull down the inner barriers by the reconstruction and functional change of district centres. With the implementation of this tool the heterogeneity of the city's texture has become somewhat reduced as the project invested not only into the revitalisation of district centres, but also into the reconstruction of important corridors between the sectors of the city and within them. The revival of public squares and parks project pillar managed to spread the development among 12 different sites, out of which nine is located outside of the historic centre. The reconstruction of highly degraded public spaces improved the quality of local residential

environment and also changed the texture of the city positively. The budget of this project pillar reached 7.4 billion HUF.

Beside the prestigious investments in the city the cultural capital program also meant several programs throughout the official year, before and after. The calendar of cultural events on the official website of the project (www.pecs2010.hu) has shown around 550 events between January 2009 and June, while up to May 2011 an additional 200 contributed to the success of the event. Large scale, internationally really attractive programs could hardly be found, but the variety of programs is sincerely creditable. Grand concerts were difficult to be organised as the possible (new) venues to host them were all under construction in 2010, furthermore, because of the late start and the uncertainty, internationally reputed stars were not able to schedule a Pécs program into their busy agenda. Nevertheless, the delay in the investments transferred both the program sites to open air locations and the dimension of the programs: smaller and more specific events entertained the public all around the year and the city. The repaved and restructured public spaces offered pleasant locations not only for visitors in a growing figure (AUBERT, A. *et al.* 2010), but also for locals. This unintentional arrangement shifted the structure to a less international and less concentrated (both in time and space), but more sustainable character (HAJNAL, K. 2008).

By the end of 2010 most of the new investments were completed (September – library complex, November – exhibition hall, December – conference centre) offering new venues for the closing events of the program series. Since then the constructions have continued opening interesting new segments of the investments to the public almost every month. The long lasting highway development from the capital to Pécs speeded up significantly because of the cultural capital programs, and it was opened in March 2010 shortening the access to the city with almost an hour.

Conclusions

Pécs managed to win the national and international contest for title European Capital of Culture 2010 which gave an enormous impetus to the development of the city and its environs. A substantial infrastructural reconstruction was added to the large scale investments to cultural premises initiating a structural change both in the urban morphology and the (cultural) economy of the city.

Within the patchwork urban structure cultural institutions in Pécs originally could be characterised with the dominance of the historic inner city. Developmental policy made several attempts to resolve this disproportion in the socialist era, but it was just these scattered institutions (community centres, movies) that were brought to an impossible situation and then collapsed

with the marketisation of culture. The two factors discussed above i.e. the spatial expansion of the university and the appearance of cultural economy elements relying on university students, together with the manifested effects of the European Capital of Culture 2010 project investments all lead towards the relief of spatial concentration. It is particularly the European Capital of Culture projects located east of the inner city that might have a significant revival effects on the structure via both the realised public investments and the announced or planned private ones. They can speed up the renewal of definite districts, extend the attractive historic centre, and add new elements to raise the city's cultural reputation.

New cultural institutions and venues placed formerly neglected districts of the city not only on their mental, but also on the cultural maps of both dwellers and tourists. In this sense the project reached its goal; it contributed significantly to the (international) image of Pécs, while it spurred the unavoidable urban renewal of certain districts and the entire city. (The detailed map of the new pattern of cultural sites in Pécs can be studied in Hungarian Geographical Bulletin, Volume 59, Number 1, p. 72., http://www.mta.hu/konyvtar/kiadv/HunGeoBull2010/HunGeoBull_2010_1_70-76.pdf)

The most important sites of renewal and revival signify the new cultural axis of the city of Pécs, which – based on its direction and relation system – could generate such a supply structure (ranging from universal values to subculture), in which the entire population of the city i.e. locals, together with university students and tourists could find pleasure, whereas it could also yield some profit for its managing entity. It would mean a linkage between the new Zsolnay Cultural Quarter with the inner city which is to gain deepened cultural functions and with the university district located somewhat towards the west, across residential areas now awaiting renewal. Unfortunately, the southern expansion of the inner city has not manifested yet, as the reconstruction towards that direction failed because of missing resources. Although it is also a strategic direction – linking the centre to the railway station –, which used to be a popular place in the turn of the 19–20th century, important traffic corridors (national road No 6) and a housing estate form obstacles at present.

The new cultural axis is to transpose the old monocentric heritage and cultural pattern, signs of successful transformation can be seen even just after the official year of the program. The essential extension of program venues and cultural supply can bring life to formerly hidden, unknown corners of Pécs and also help transformation towards cultural economy. Private investments are essential to be contributed as public sources reached their limits putting a heavy burden of debt on the municipality budget for decades. Although this new pattern is just under realisation and new elements of it are to be strengthened, conflicts among different interest groups have surfaced recently.

The new M6–M60 highway to Pécs is expected to boost the economy: the first signs of investors' inquiries can be felt just a year after its opening. Although the construction of the highway was not included in the project, it contributed not only to the success of the programs, but to the spatial transformation of the city. As the new track reaches Pécs from the south, the traditional, rigid east-west pattern is to be biased. Along the well reconstructed and widened route from the city centre to the highway and the awakened airport investments started to take place, moreover even the real estate market evaluates this district prosperous.

The Cultural Capital of Europe 2010 programs and investments have brought progressive ideas to development, highlighting new dimensions, areas and directions. Even at this stage it is visible that it promoted to reweave the pattern of the city, having extended the cultural inner city both spatially and spiritually. Although Pécs is still full of problems to be solved, one can see in 2011 that the Borderless City program resulted a city with much less borders.

Acknowledgement: The present research was supported by the K 73739 OTKA project (Hungarian Scientific Research Fund).

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Retail competitiveness in a middle sized border town (Komárno, Slovakia)

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Abstract

Our study deals with the rapid transformation of the Slovak retail network as well as it analyzes the changes in shopping habits in Komárno, a medium sized border town in Slovakia. The first part of this paper, which is based on a desk research, analyzes the transformation of Slovak retail trade in the past few years. After providing an overlook of the national trends, the characteristic features of retail trade in Komárno are introduced. Those economic processes are pointed out which have initiated fundamental changes in the retail trade of this gateway town in southern Slovakia. In the second part of the paper we introduce the results of the field research carried out on two sets of samples with 300 respondents each. The investigation was aimed at finding out about peculiarities arising from the economic recession and from the fact that Komárno lies on the border.

The research was carried out between 2008 and 2010 in order to explore the effects of the downturn on shopping habits. In our research we aim to find out, whether the closeness of the frontier and its distorting influence on economic processes can have a significant effect on market actors. Therefore we consider the permanent monitoring of cross-border market processes to be extremely important, so that (retail) businesses are able to react to individual rapid changes in the economic environment. Since nearly one third of the 174 micro-regions in Hungary and several regional centers are situated directly in frontier regions, it is especially important for retail businesses run in those regions to find out about the economic conditions prevailing on the other side of the border.

Keywords: cross-border retail trade, shopping centers, competitiveness, shopping habits.

Introduction

The towns and settlements lying near the border have gone through significantly divergent historical developments in the past three quarters of a century.

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This divergence was present in their demographic, ethnic, religious, economic, educational, cultural and other developments (with a special view to changes in the situation of the Hungarian minority in Slovakia). Thus, there were substantial differences between settlements on the two sides of the border in the level of economic development and in the standard of living. These differences were especially manifested in the case of Komárno in Slovakia and Komárom in Hungary, which used to be one town on the Danube until they were forcefully divided by the new Hungarian–Czechoslovak border in 1920. It took nearly seven decades (except the period between 1938 and 1945) until the Hungarian and the Slovak parts of the town got into a situation (in the 1990s) that the preconditions of a long-term, coordinated, joint urban development were given. Nowadays the two towns are coming closer to each other in many respects. The most important signs of this advance seem to be manifested in the increasing number of commuters employed on the other side of the border, developing tourism and cross-border retail trade, gradually growing international migration and the renewal of personal relationships as well as in increased vehicle and pedestrian traffic, which has arisen from the above mentioned phenomena.

The above developments promote the approach of the two towns in the fields of organizational, institutional and personal relations as well as in culture, sports, education etc. The volume of foreign capital investments arriving to the region has also started to increase. What is more, new bilateral and multilateral cross-town cooperation programs and regional development cooperation programs have been launched in the framework of EU-related activities, such as the Euroregion Vagus-Danubia-Ipolia or the Pons Danubii EGTC.

Retail trends in Slovakia

The Slovak retail network has gone through significant structural changes (DAWSON, A.J. 2007). A large number of shopping centers of different size and profile have been opened since the second half of the 1990s both in Slovakia and Hungary. The four popular hypermarket chains in Slovakia are the following: Tesco, Kaufland, Hypernova and Carrefour (SÍKOS, T.T. 2007). Besides these a number of different supermarkets and deep discounters also appeared on the market. Due to their smaller size these can be found in the city centers or in their vicinities. The following can be mentioned as examples: Billa, Jednota, CBA or Lidl.

Table 1 shows the turnover of the Top 10 retailers in the past three years as well as the number of stores added to their chain. The top four retailers managed to keep their position on the market. Tesco is one of the most popular and

Table 1. Top 10 retailers in Slovakia, 2007–2009

2007			2008			2009		
Retail chain	Number of stores	Turnover in billion Slovak crowns	Retail chain	Number of stores	Turnover in billion Slovak crowns	Retail chain	Number of stores	Turnover in billion Slovak crowns
1. Tesco	58	35.7	1. Tesco	70	40.5	1. Tesco	81	34.40
2. C&C Metro	5	17.6	2. C&C Metro	5	18.5	2. C&C Metro	5	13.80
3. Billa	90	13.3	3. Billa	94	14.4	3. Billa	100	13.20
4. Kaufland	29	10.8	4. Kaufland	35	11.2	4. Kaufland	40	10.60
5. Ahold Retail	25	8.0	5. Ahold Retail	25	8.3	5. GG Tabak	80	9.30
6. CBA SK	280	5.3	6. Nay	24	6.9	6. Ahold Retail	25	7.53
7. Lidl	98	4.9	7. GG Tabak	80	6.3	7. Lidl	112	5.30
8. Labaš	9	4.1	8. Lidl	110	5.8	8. Nay	25	5.20
9. Coop BA	23	3.2	9. CBA SK	250	5.7	9. CBA SK	250	4.90
10. Coop NZ	110	2.8	10. Baumax	14	5.3	10. Baumax	14	3.70

Source: AC Nielsen, 2008–2010.

most dynamically developing retail chains in Slovakia. It has more than 80 stores ranging from hypermarkets through supermarkets to Tesco Express stores. Though Metro did not open new stores in the above mentioned period, their turnover increased considerably. Billa managed to keep its position by opening new stores: in 2009 they had as many as 100 stores. The same applies to Kaufland, with the difference that their growth in the number of stores was not as large as the one of Billa. Hypernova, which is run by Ahold Retail, was not able to maintain its earlier position, and its place was overtaken by GG Tabak, which sells mainly tobacco products and newspapers. Nay, the electrical shop chain lost its sixth position and ended up in eight place at the end of the period. Baumax appeared on the Top 10 list in 2008, and it has been able to keep its position since then. The fact that retail chains in cooperative ownership lost their position is also supported by the fact that the two largest cooperative chains disappeared from the Top 10 list. These are the two Coop Jednota chains, one with its seat in Nové Zámky and the other one with its headquarters in Bratislava (YUDELSON, J. 2010).

Food industry suffered the least as a result of the downturn in 2009; however, food retailers' turnover also fell for the

first time in fifteen years. The combined turnover of retail chains decreased considerably, namely by 12%. Nay, Baumax and Metro saw the most dramatic decrease: their turnover fell by 25–30%. On the other hand, the turnover of Billa, Kaufland and Lidl fell only by 5–8%. It was only GG Tabak that increased its sales. The above decreases were also caused by the fact that fewer retail chains opened new stores in 2009. The expansion of retailer centers slowed down. This had not happened in the previous five years. Merely some 60 centers were opened in 2009, which was much lower than the corresponding number a year earlier. Further expansion and the launch of new projects can be expected in 2010. Billa is planning to open at least 10 new stores, and Jednota hopes to open 40 units. Kaufland is expecting to implement 20 new projects in the next five years.

After providing an overview of the most important retail trends and market situation on national level let us analyze the specific features of retail trade in the town of Komárno. The analysis can be divided into three major parts. In the first part those macroeconomic processes will be investigated that have fundamentally influenced the retail sector. We will also analyze the most important factors of the town's retail trade. Finally, it will be provided a comparative analysis of the results of our field research carried out in 2008 and in 2010.

Macro factors influencing retail trade

The development of the retail sector depends on the fluctuations of effective demand. There are parallels between the unemployment processes of Komárno District and its economic development, thus the purchasing power of its population can be well characterized by unemployment trends in the district (*Figure 1*).

Unemployment in Komárno District has developed in three stages since 1997. The first stage can be described with persistently high unemployment rates. The number of jobless people permanently exceeded ten thousand. The rate of unemployment decreased rapidly during the second stage between 2004 and 2008. This was due to the economic development of the country. Free movement of labor arising from the country's EU accession also contributed to the decrease. Several thousands of people from Komárno and the surrounding region found employment with one of the companies that had settled in the industrial park in Komárom on the other side of the border in Hungary. In the third stage, which still lasts, the number of those looking for a job has been rocketing as a result of the economic downturn. The number of unemployed people has come near to ten thousand again. Due to the fact that in the third stage unemployment increased again the proportion of discretionary income

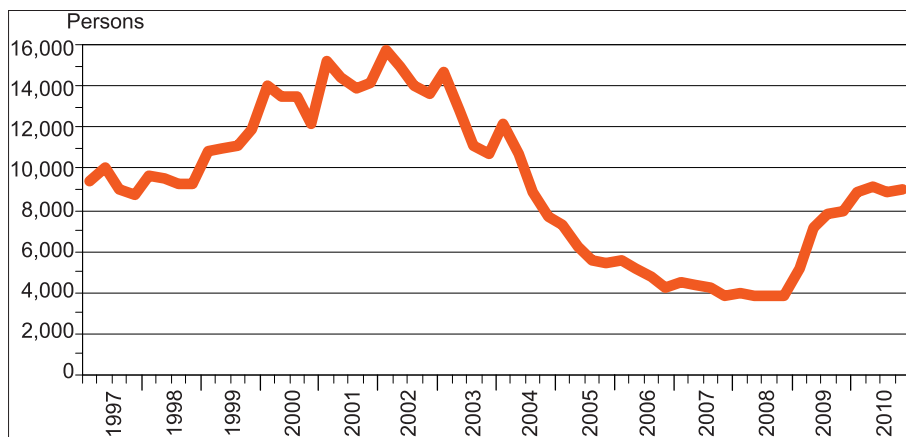


Fig. 1. Change in the number of unemployed people in Komárno District
Source: www.upsvar.sk

in households decreased, bringing the retailers in the town into a difficult situation. On the other hand, it is not only macro market conditions that influence business opportunities of retailers in Komárno. Since the town lies on the border, retail trade in Komárno is also significantly influenced by the exchange rate between the Hungarian forint and the euro (earlier the Slovak crown). By looking at the long-term course of the exchange rate between the above-mentioned two currencies it can be concluded that the forint has been permanently losing value against the Slovak crown (euro) since 2004. The depreciation of the forint was not only the result of the downturn in 2008. It was already present in the period when the Slovak economy was developing fast and the Hungarian economy was sluggish, or stagnating (from the second half of the 2000s) (*Figure 2*).

The constant weakening of the forint proves to be beneficial for Hungarian retailers close to the border; on the other hand, it puts retailers who run their businesses in Komárno and in other frontier regions into an unfavorable position.

Changes in the exchange rate weaken the position of Slovak retailers in two respects. On one hand, doing the shopping in Hungary is increasingly worth for those who earn euros in Slovakia. The reason for this is that the purchasing power of forints that they get for one euro is higher in Hungary than the purchasing power of a euro in Slovakia. Moreover, those Slovaks who are employed in Hungary increasingly tend to spend their forints in Hungary in order to avoid loss on exchange. The number of the latter ones in the whole frontier region amounts to more than ten thousand (HARDI, T. 2008). Their

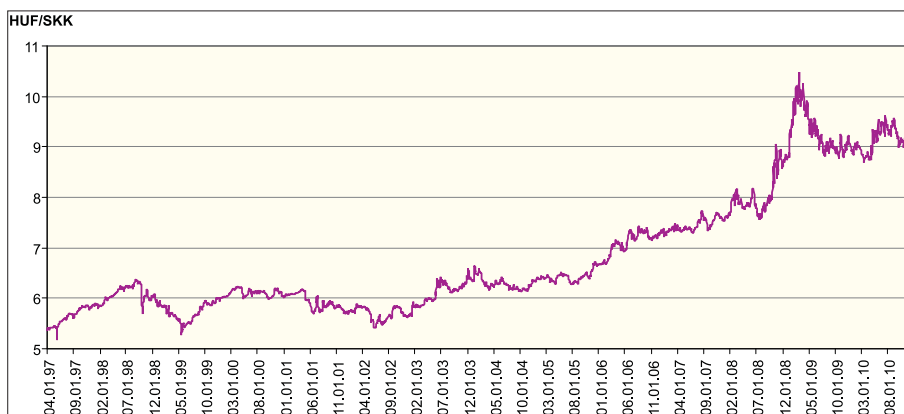


Fig. 2. Hungarian forint/Slovak crown exchange rate developments. Euro became the legal tender in Slovakia on 1 January 2009. The exchange rates as of 2009 shown above have been calculated with the permanent Slovak crown/euro exchange rate (30.126 SKK/EUR).

Source: www.mnb.hu

shopping habits have been analyzed in a number of studies (SİKOS, T.T., and TİNER, T. 2007; SİKOS, T.T. and KOVÁCS, A. 2008; KOVÁCS, A. 2010).

Retail trade development processes in Komárno

In the following part of our study the most important features of the retail sector in Komárno will be analyzed. First, the most important market actors will be introduced (TERRY, C. 1994), and then the role of the most important retail establishments in town, i.e. hypermarkets, will be looked upon. This will be followed by the analysis of the retail function of the historical town center. We will also investigate what dangers the shops located in the town center would be exposed to if a new shopping center were built in town. In the closing part the most important characteristic features and developments of the cross-border retail trade will be highlighted, and the trends throughout the deepening crisis in 2009 and during the time of the slow recovery in 2010.

Retail networks on the two sides of the border

The spatial processes of the retail trade of Komárno can be understood only if they are analyzed together with the retail network developments of the southern neighboring town in Hungary, Komárom. Therefore, in the following a

short overview of the two towns' retail sector developments will be provided by touching upon its most important elements.

There are numerous parallels between the retail sector developments of the two towns. Komárno has a population of 37,400 and Komárom has 19,900 residents, and the retail trade of both settlements is dominated by Western European capital-intensive retail networks (*Table 2.*)

Table 2. The most important international food retailers in the two towns

Komárno		Komárom	
Retail unit	Opened in	Retail unit	Opened in
Kaufland	2002	Spar	1993
Hypernova	2003	Penny Market	2000
Billa	2005	Tesco	2005
Family Center	2008	Spar	2007
Lidl	2010	Spar	2009

Source: Own collection

None of the towns have a significant shopping center in their town center; however, both towns have a restored, reconstructed department store, or a retail establishment of a strip mall kind (SIKOS, T.T. and HOFFMANN, I. 2004). As examples of reconstructed department stores in Komárno the Ister (former Váh) retail establishment and Komárno Shopping Center (former Prior) could be mentioned. The one in Komárom, Hungary is the former Duna Department Store. An example of strip malls is the Family Center in Komárno, which opened in 2008. An investment project of minor importance that was carried out following the change of regime was the opening of Millennium Üzletház in Komárom.

Before the financial crisis hit in 2008 there were plans to open a 12,000-square-meter shopping centre in Kossuth Square, which is the market square in Komárno. However, due to the crisis the project has been postponed indefinitely.

The already implemented and planned developments have considerably changed the traditional shopping areas, i.e. the centers of both times. The retail network of Igmándi Street in Komárom as well as the network of Župná, Palatínova and Valchovnická streets in Komárno have regressed. Stores have been replaced by catering and entertainment facilities, such as cafes, restaurants, clubs etc. (*figures 3 and 4*).

Comparing the maps from 2005 and 2010, it can be concluded that the retail network of the town center has been transformed significantly during the last five years. It has been prompted by a complex system of factors: the spread of new types of retail stores (*cf. Table 2*), the lack of capital in local small businesses and the unfavorable effects of the economic regression that started at the end of 2008 have all contributed to this change.

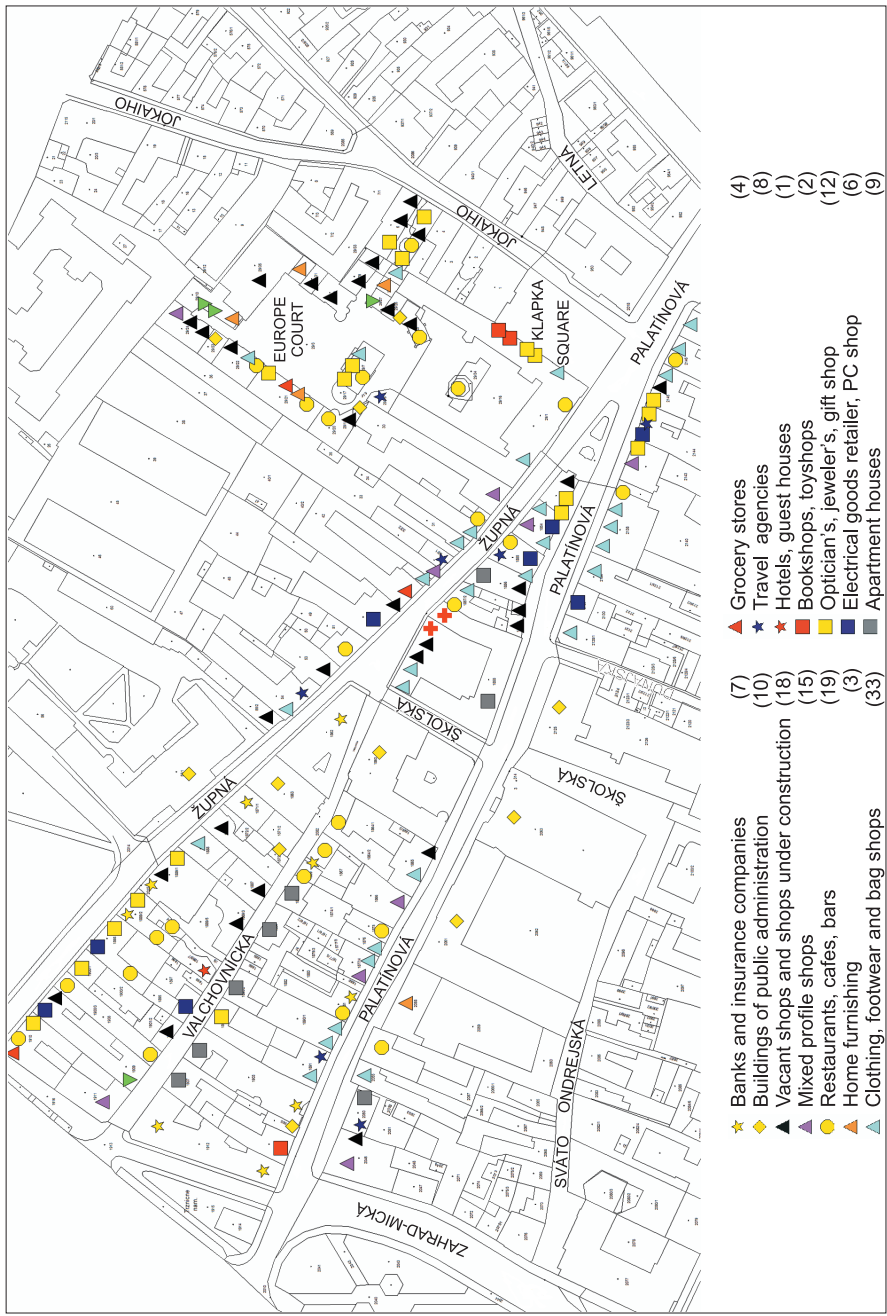


Fig. 3. Retail network of Komárno's town center, 2005. Source: SIKOS, T.T. and TINER, T. 2007.

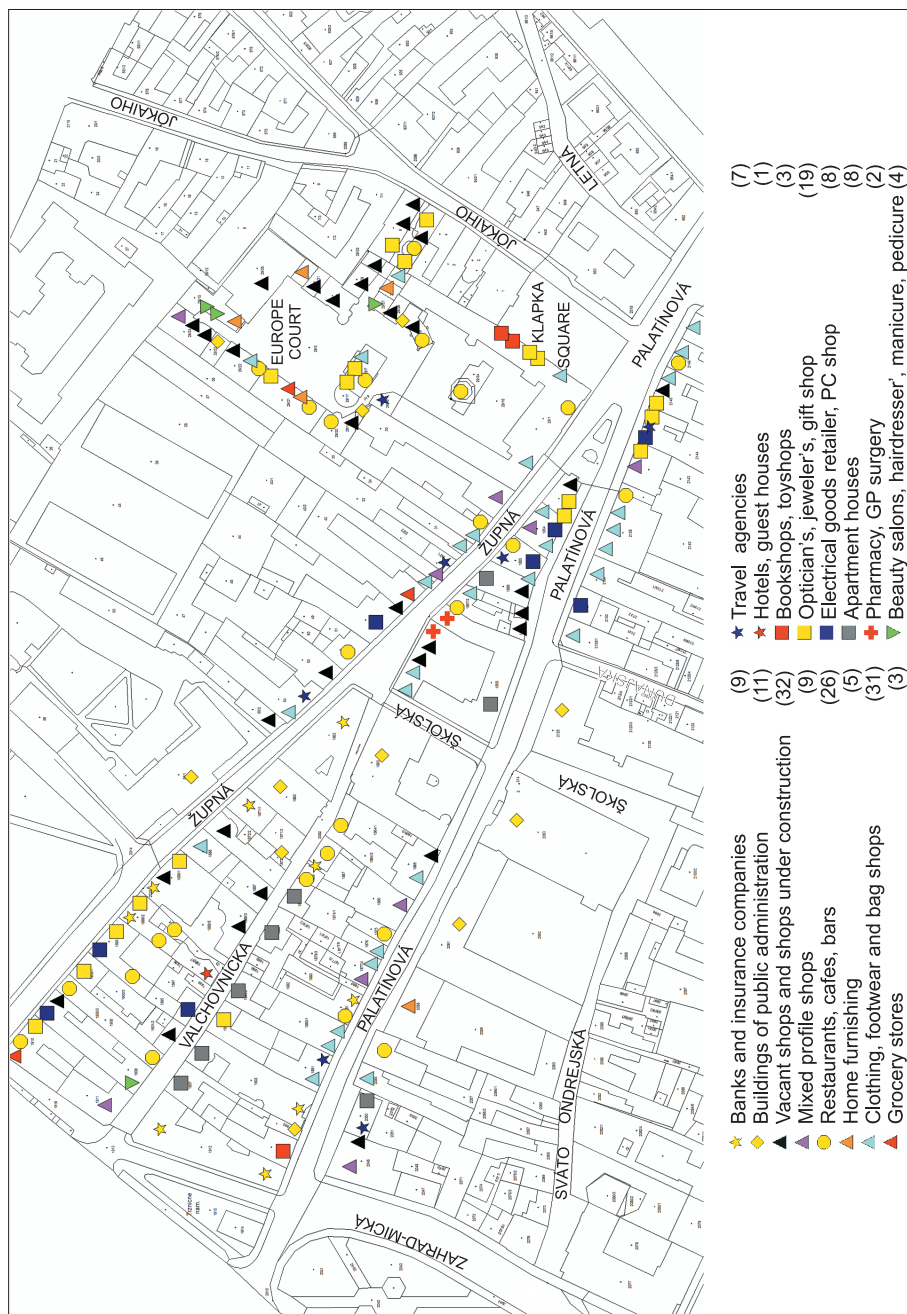


Fig. 4. Retail network of Komárno's town center, 2010. *Source:* own collection, 2010

The most important elements of the change could be summarized as follows: the number of vacant shops has increased dramatically; the number of businesses involved in the catering industry has also increased considerably; retailing function, that had a significant role in the past, has lost importance. What is more, new service units such as hairdressing and beauty salons and healthcare services (GP surgeries, pharmacies) have appeared in the downtown. The transformation of the town center is still in progress. Tenant fluctuation is extremely high. There are stores that do not stay open even for a year.

On the basis of our observations the service units are not able to replace all retail stores that have closed; thus, the number of vacant shops is growing. The shopkeepers react to falling demand in different ways. In order to survive they reduce the size of their shops, which brings along an increased number of stores in the center. Furthermore, completely or partly new, supposedly more competitive store profiles have appeared.

It can be concluded that the retail market of the two towns is rather competitive. Consumer preferences are influenced both by the macroeconomic circumstances outlined above and by the marketing strategy and market behavior of each store. The fact that the two towns lie on the frontier results in a special competitive environment, where there is not only horizontal competition (between shops of similar profile, function) and vertical competition (between shops with different size and function) in retail trade, but due to the closeness of the two towns and the permeability of borders there is international competition between the retailers.

In our empirical research the most important elements and relations of this complex competitive market situation were explored. In the next part of the paper the most important results of our research will be summarized. Two surveys were carried out: one in 2008 and another in 2010. In both of them 300 respondents were asked. Our data collection took place in the most important retail zones of Komárno (Župná and Palatínova streets, Klapka Square, Jókaiho Street and the Hypernova and Kaufland shopping centers) as well as at J. Selye University in order to ensure that different age groups, different social strata and different income levels were represented in the research sample.

Analysis of changes in shopping habits

The distribution of respondents is similar in the two research samples. One third of respondents are male, two thirds are female. The reason for the higher representation of female respondents is the fact that shopping is still mostly done by women. Therefore, our aim was to represent this fact in our research sample, too. Data collection took place on different days of the week, in different parts of the day in order to ensure that respondents who regularly do

their shopping on certain days and at certain times would be represented in the sample with a similar probability.

The distribution of respondents shows well that all age groups of the population are represented in the sample. However, the age group of people from 21 to 40 was overrepresented in the sample purposefully. The reason was that this group is important for marketing communication, since the sensitivity of its members to new advertisements and messages is high. Furthermore, their brand loyalty is rather low and they have considerable discretionary income and represent high purchasing power.

The age distribution of the samples from 2008 and 2010 is very similar, so the results of the two surveys are comparable (Figure 5).

Considering the occupation of the respondents it can be seen that the majority of shoppers in the town work in the service sector, or they have some sort of white-collar jobs. Due to their special customer needs and behavior, students/undergraduates can be considered to be an important part of our sample. Most respondents who were put to the “Other” category are home-makers or they are on maternity leave. The proportion of retired people, in accordance with the age distribution of the sample, is low (Figure 6).

A vast majority of respondents in both samples finished secondary education, which corresponds to the general education level in the region.

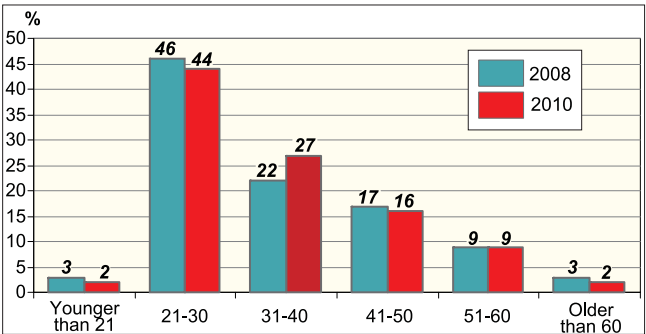


Fig. 5. Age distribution of respondents. Source: Own collection

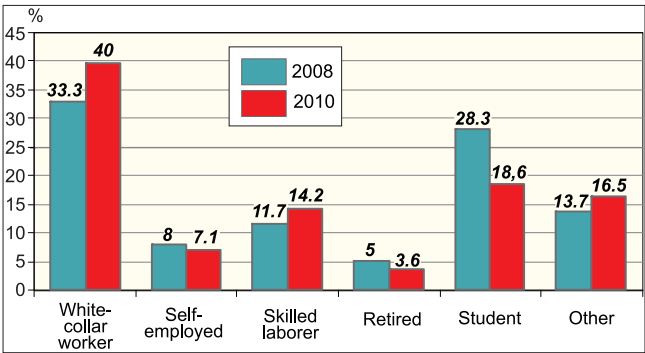


Fig. 6. Distribution of respondents by occupation, 2008, 2010. Source: Own collection

The sample from 2010 includes more respondents with a first- or second-level university degree; however, the difference between the two samples in this respect is insignificant (*Figure 7*).

After examining the basic features of the research sample (age, occupation, education level) it can be concluded that the social and economic status and the demographic features of respondents in the two samples are similar to a large extent. Thus, the results of the two data collections are comparable. In the next part of the paper a comparative analysis of the two questionnaire surveys will be carried out with an aim to find out what caused the changes in shopping habits in two years.

When analyzing shopping habits, one of the most important issues is the analysis of shopping frequency. Although only two years passed between the two data collections, the shopping frequency of customers in Komárno changed considerably. In 2008 nearly 60% of respondents purchased something in different retail units nearly every day. In contrast, a similar proportion in 2010 belonged to the group of those who did their purchases only few times a week. The proportion of those doing daily purchases decreased by 20

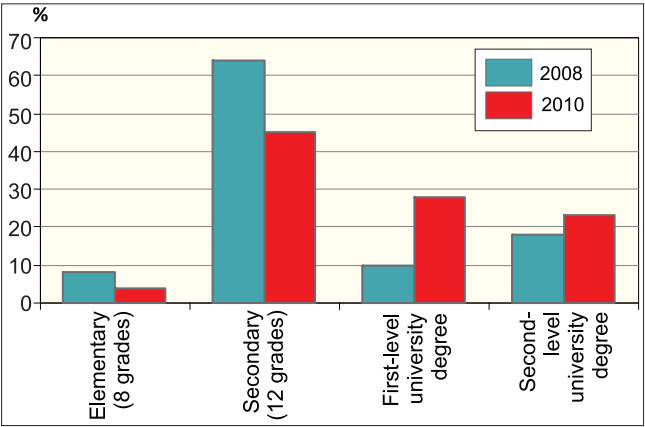
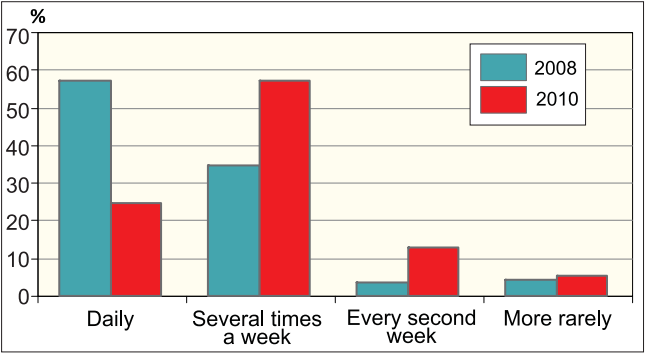


Fig. 7. Distribution of respondents according to education level. Source: Own collection

Fig. 8. Shopping frequency of respondents. Source: Own collection



percentage points (*Figure 8*). The reason for this might probably be the rise in unemployment caused by the economic recession and the consequent fall in incomes. The number of ad-hoc, impulse purchases decreased; shoppers spend their money more carefully; they rationalize their shopping trips, since getting to the shops also costs money.

Besides the evaluation of shopping frequency another important piece of information is shop preferences and the changes that might have taken place in it. In the framework of both surveys the respondents had to mark the most important hyper and supermarkets in Komárno and Tesco in Komárom in order of how often they visit each one. *Figure 9* shows the position of retail establishments in the years 2008 and 2010.

Respondents were asked to rank stores on a scale of 1 to 5, where the ranking was proportionately higher to the frequency of their visits to that store. *Figure 9* shows the individual average scores of each chain. Lidl does not figure in *Figure 9*, since it was opened in 2010; therefore, comparison with 2008 was not possible.

It was Kaufland in both years that was visited most frequently by respondents from Komárno. The reason for its popularity is that this retail establishment situated near the road to Bratislava is the largest one and offers the lowest prices among all centers (as far as respondents stated). There are several Coop-Jednota supermarkets in town. These came in as second on the list for the reason that they are located close to respondents. The significance of cross-border retail trade is also proven by the fact that the Tesco store located in Komárom, Hungary is the third most popular retail establishment among

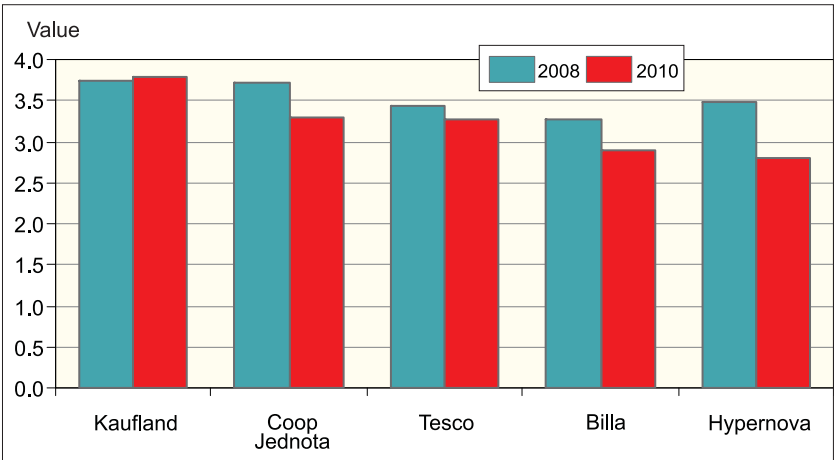


Fig. 9. Change in the popularity of food retailers situated in Komárno and Komárom.
Source: Own collection

respondents from Komárno, Slovakia. Tesco's popularity lies in its closeness to respondents, in its price level (and in the favorable development of exchange rates), in its wide selection of goods and in the fact that a large number of respondents are employed in Hungary. The least visited center among shoppers in Komárno is Hypernova. Its popularity has decreased considerably in the past two years. Even the Billa supermarket situated in the town center proved to be more popular. One of the reasons for Hypernova's so called weak performance might be the fact that its owner, Ahold Retail, stopped its expansion in Slovakia in the last few years. It has been announced to withdraw from the Slovak market several times. As a result, this stagnation and uncertainty has a bad influence on the quality of its services.

Besides the preference survey concerning hypermarkets we also aimed to find out what role they have in the distribution of different commodity groups. Hypermarkets are retail units with large floor space selling primarily foodstuff, where other fast moving consumer goods (FMCG) and consumer durables are also available.

Not surprisingly, 80% of respondents buy foodstuff in these stores. However, besides these, as it has been proven by both surveys, 40% also regularly purchase toiletries, and 10% regularly buy clothing, books and electronics (*Figure 10*). This means that hypermarkets have a considerable market share on the non-food market too.

Shopping frequency from a business point of view can be construed only together with data showing how much shoppers spend per shopping

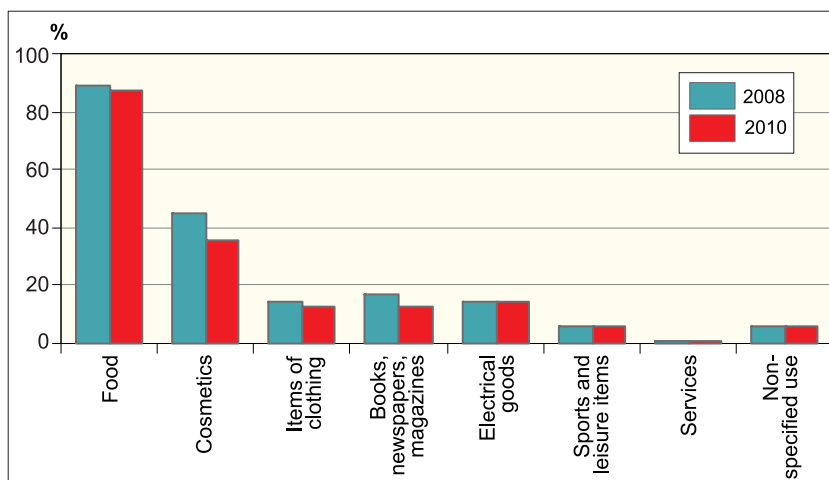


Fig. 10. Goods purchased in hypermarkets and supermarkets included in the research.
Source: Own collection

trip. The values of spending per shopping trip in 2008 and 2010 were nearly equal; no significant changes can be found between the data gathered in the two years. Almost half of the respondents spend between 20 and 40 euros (appr. between 5,000 and 10,000 Hungarian forints) per shopping trip.

The downturn has not influenced the value of baskets per shopping trip significantly. Nevertheless, as it can be seen in *Figure 10*, it considerably contributed to a decrease in shopping frequency. This means that shoppers do their shopping less frequently, supposedly considering more carefully what to buy; still, their spending per shopping trip has not decreased. Though it must also be stated that it has not increased either, which due to inflationary influences meant a certain decrease in real value (*Figure 11*).

The reason why the value of spending per shopping trip has not decreased is perhaps the following: shoppers behave rationally if, besides the fixed costs arising from one shopping (i.e. time spent with shopping and the cost of getting to the shop), they do not decrease the average basket value of each shopping. If their spending per shopping trip decreased, it would result in the increase of proportional costs of each item purchased.

The town centre and the expected effect of the planned shopping center

Besides analyzing the shopping habits of those shopping in the most important retail centers of the town we also consider it important to analyze what

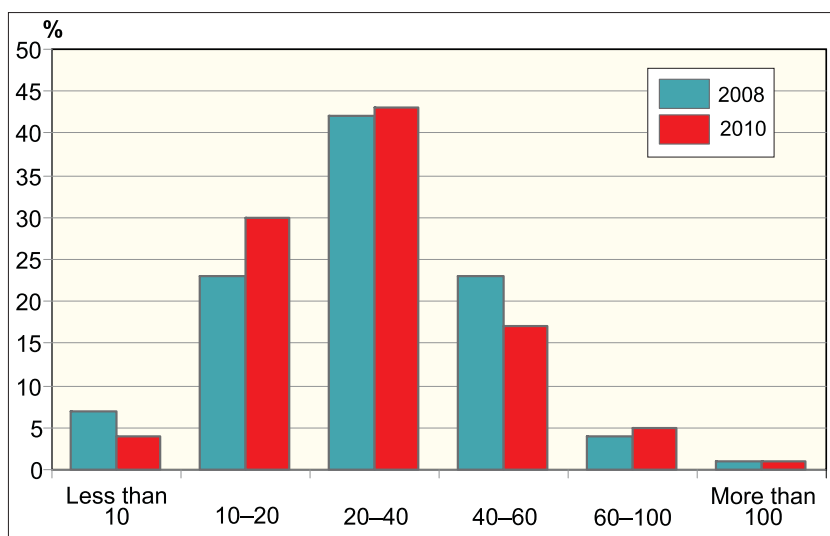


Fig. 11. Average spending per shopping trip, in EUR. Source: Own collection

the attitude of Komárno residents is to the traditional high streets of the town (Župná, Palatínova and Valchovnická streets, Klapka Square). We also aimed to find out what the residents' attitude is to the opening of the new shopping center (Aquario Center Komárno).

The market dominance of new retail centers is demonstrated by the fact that nowadays only 26% of respondents visit regularly the shops situated in the town center (those that were left). 65% of respondents stroll the traditional high streets of the town only rarely (Figure 12). The decreasing retail function of town centers and the falling number of shops there is caused by the drain effect by modern, large-area shopping centers usually situated away from the town center. Retail shops in the town center of Komárno are gradually replaced by establishments involved in catering and/or tourism (though also with low prosperity).

The shop preference of those visiting the town center is important from two aspects (Figure 13). On one hand, it shows the profile of shops currently operating in the center. On the other hand, the profile of shops currently run in the center is similar to the shop mix of a shopping center: there are a lot of

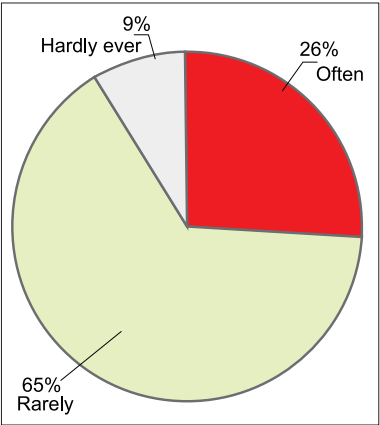


Fig. 12. Frequency of respondents' visit to the town center. Source: Own collection

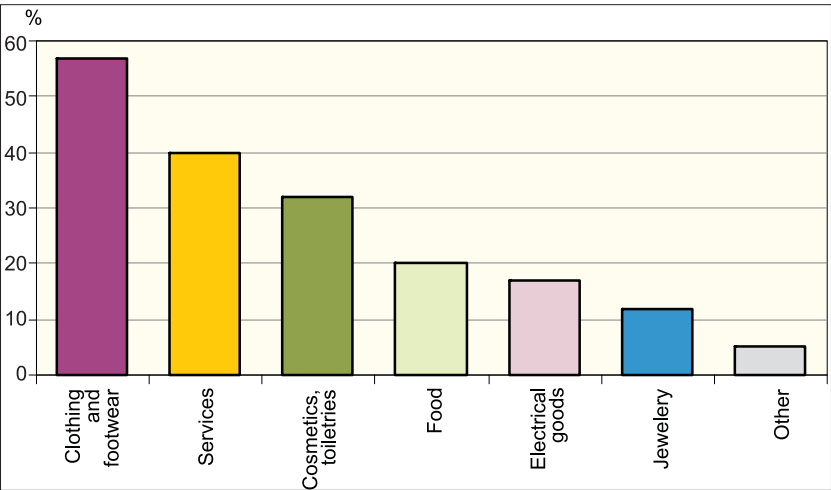


Fig. 13. Proportion of shops visited in the town center. Source: Own collection

service-based units, a large number of shops selling clothes, shoes, cosmetics and perfumes. This fact is a warning that the building of the planned shopping center might considerably bring the popularity of the tow center further down.

The opening of Aquario Center will presumably further decrease the already low popularity of the town center. Shoppers from its gravity zone will probably prefer the covered and air conditioned premises of the shopping center, where they will have opportunities for shopping and entertainment without being influenced by weather conditions outside.

However, the opinion of respondents expressed in 2010 does not correspond fully with our expectations. Only 30% of them consider the building of a shopping center to be an absolutely positive thing. Nearly 50%, which is a large amount, think that the investment is unnecessary. As much as 25% think that the majority of people do not have enough disposable income that can be spent in shopping centers (*Figure 14*).

A difference in the opinion of residents is a typical phenomenon, since usually a large number of opinions for and against large investment projects are expressed publicly. Consequently, these form the opinion of the population. The opinion of those being against the shopping center investment project is based upon the statement that the retail sector of Komárno already provides a wide choice. A new shopping center, however, does not necessarily mean further capacity growth; it rather causes a change in spatial distribution. A group of retailers based in the town center are expected to leave the traditional

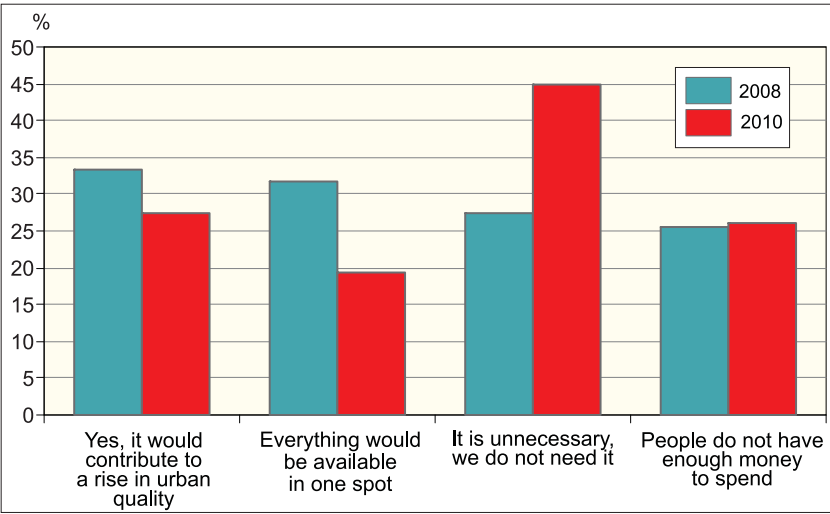


Fig. 14. People's views concerning the planned shopping center in town. *Source:* Own collection

high streets and will open new stores in the shopping center with hopes to make higher profits. This phenomenon has been observed in other towns as well: new shopping centers so to say drain the existing retail zones of their competitive shops, thus creating new, so called covered town centers.

The other group of skeptics represent the opinion that people usually do not dispose of enough income, which would provide for the profitability of a new shopping center and its shops. It deserves attention that this view was similarly present in both surveys, and 25% of respondents had the same opinion already in 2008. This piece of information might prove to be useful for the investor, when determining the shop mix of the shopping center. The reason for this is that according to the results of the survey one fourth of the shoppers in Komárno are highly price sensitive and have low income.

Trends of cross-border retail trade during the economic downturn

As a result of the fact that Komárno lies on a border the retailers of the town compete with each other in a special environment. The reason for this is that there is not only horizontal and vertical competition on the market, but there is also international competition between Slovak and Hungarian retailers.

The presence of cross-border retail trade can significantly influence the success of retailers in a border zone in a way that it can generate additional demand from the other side of the border, or contrarily, it can also cause that domestic shoppers will do their purchases abroad.

This process has been observable in Komárno and Komárom for several decades. What is more, nowadays, after EU enlargement and the introduction of Schengen borders, this process has gained intensity. The reasons for this are the following: a large-scale cross-border commuting of workforce, free movement of goods and services and rapid changes in exchange rates in the past two years.

Cross-border retail trade processes are influenced by a complex system of factors. It is not only exchange rate developments that drive these processes; although currency exchange rate developments have an important role in them (Kovács, A. 2010). In the following we will try to introduce a few important peculiarities of this complex phenomenon. Developments in the euro/forint exchange rate largely influence the shopping frequency of Slovaks in Hungary (*Figure 15; cf. Figure 2*). Based on our sampling in 2010, our respondents' shopping frequency abroad was analyzed during the following two periods: the spring of 2009 when the forint's value against the euro was extremely low, and the first half of 2010 during the time of exchange rate correction. In 2009 (310 forints to the euro) 25% of respondents went shopping in Hungary several times a week, and one third of them did the same at least once in every two

weeks. They went mainly to Komárom, Győr and Budapest. In 2010, however, 25% of respondents went shopping in Hungary only every second week, and another one fourth shopped there not more often than once a month. The decrease in shopping frequency is remarkable; however, the values from 2010 indicate that half of the respondents, which is a noteworthy amount, go shopping in Hungary every month. This brings in additional revenues for local retailers, and additional VAT revenues for Hungary (*Figure 15*).

In order to be able to estimate how much money is potentially spent in the shops of Komárom by Komárno residents it is not enough to analyze shopping frequency but it is also necessary to find out how much money they spend there. As it can be seen in *Figure 16*, as much as 50% of respondents spend 1–10% of their disposable income in Hungary, and another 25% spend between 10 to 20% of their disposable income there. 10% of respondent spend 20–30% of this amount abroad and another 10% use more than 30% of this sum in Hungary. Only 10% of respondents do not shop in Hungary at all. On the basis of *Figure 16* it can be worked out how much a so called average

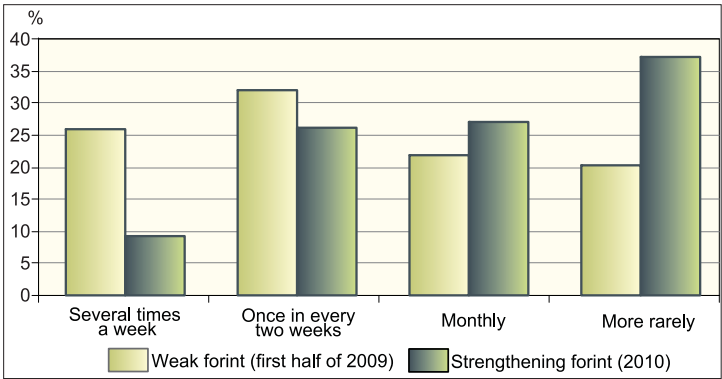


Fig. 15. Shopping frequency of Komárno residents abroad. *Source:* Own collection

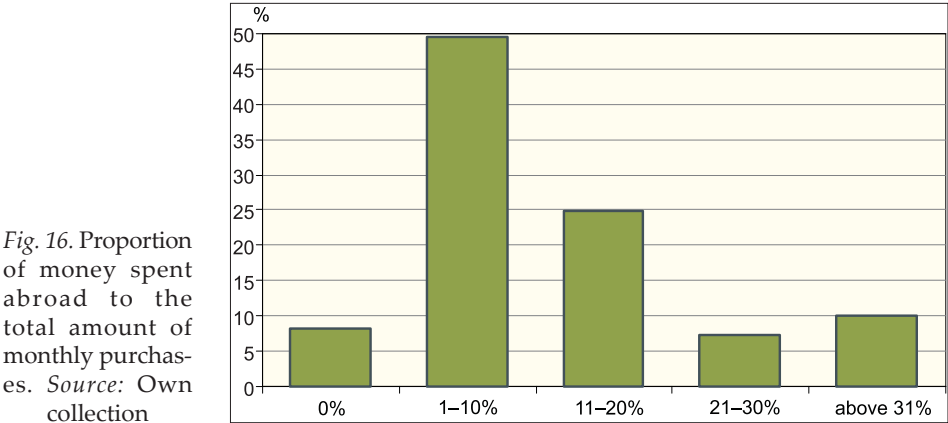


Fig. 16. Proportion of money spent abroad to the total amount of monthly purchases. *Source:* Own collection

shopper spends abroad. Thus, it can be stated that Komárno residents spend as much as 12% of their disposable income in Hungary, which represents a considerable revenue shortfall for retailers in Komárno, and it means a significant amount of additional revenues for shopkeepers in Hungary.

For the Hungarian retailers it is also important to know where people from Slovak frontier settlements do their shopping in Hungary, and in which retail centers they can generate additional revenues.

The majority of respondents residing in Komárno, namely 70%, do their shopping in Komárom, Hungary. In the case of other Hungarian towns, the further they are located, the fewer people go shopping there. It is also important to highlight, that the town of Győr, situated 30 kilometers from Komárno, and Budapest, located 100 kilometers away, were also mentioned in the questionnaire as shopping destinations (*Figure 17*).

The reason for this is that both towns have highly developed retail networks, and the quality of services is also high. Another explanation for the rising frequency of visits is that Slovak–Hungarian cross-border friendship as well as family ties and business relationships have been renewed in the past few years.

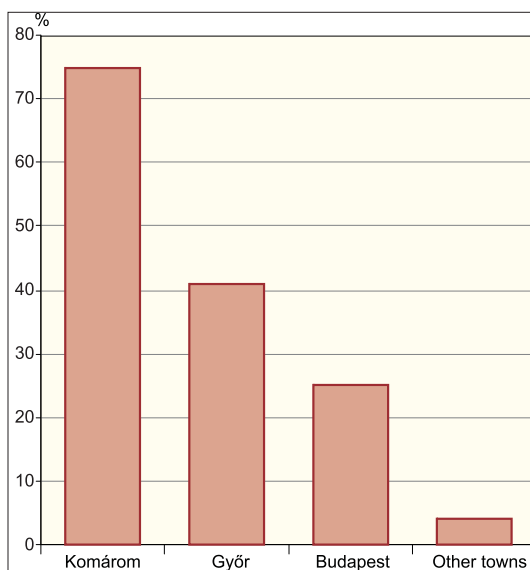


Fig. 17. Towns visited in Hungary. Source: Own collection

Conclusion

In our research the retail sector of Komárno, a border town in a special geographical position, was analyzed. The research consisted of a desk research and of a field survey. Our aim was to introduce the special features of retail trade in this important Slovak gateway town, with special regard to shop preferences, changes in shopping habits and other special phenomena that arise from the fact that the town lies on the border.

The research was carried out between 2008 and 2010 in order to explore the effects of the recession on shopping habits of the population.

It has been found out that the transformation of Slovak retail trade has been very similar to the one of Hungary, though with a time shift of a few years. Internationally owned multinational retail corporations have gained a dominant market position in Komárno too; thus significantly altering the retail sector. On the basis of our field research it can be stated that international retail corporations have fundamentally changed local shopping habits. The retail function of the town center has regressed, and the building of the planned shopping center will contribute to the further intensification of this phenomenon. The economic downturn has affected consumption and shopping, since there has been a measurable decrease in shopping frequency, while the value of spending per shopping trip stayed the same. Thus, it has been concluded that the recession and its impacts, such as growing unemployment and a decrease in wages, have negatively influenced consumption in Komárno as well. Cross-border retail trade gained hitherto unprecedented intensity at the start of the crisis in 2009. The particularly weak forint attracted a large number of shoppers to Hungary, and this caused a further fall in demand in Slovakia. During the analysis of this phenomenon it has been proven that a large number of shoppers are involved. Furthermore, besides exchange rate developments, there are also differences in shop profiles and in the commuting patterns of employees that significantly influence the above phenomenon.

The aim of our research was to examine how the downturn and the town's special frontier position affected its retail trade processes, and perform this analysis in the framework of a field research carried out in Komárno. We also aimed to highlight the impact of the economic and geographical environment on retail trade, which is of high importance during the process of recovery from the crisis, especially in today's Europe with gradually vanishing state borders.

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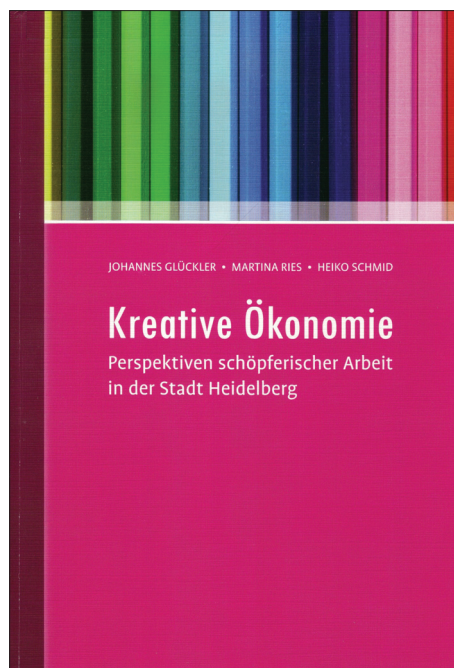
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Glückler, J., Ries, M. and Schmid, H.: Kreative Ökonomie. Perspektiven schöpferischer Arbeit in der Stadt Heidelberg (*Creative economy. Prospects of creative work in the city of Heidelberg*). Geographisches Institut der Universität Heidelberg, 2010. Heidelberg. 204 p. (Series: Heidelberger Geographische Arbeiten. Issue 131)

Heidelberger Geographische Arbeiten (*Heidelberg Geographical Studies*) is a series of research papers published at the University of Heidelberg, an excellent university in Baden-Württemberg, Germany. Since the 1956 first volume, more than ten dozens of scientific studies have been released by the university's Institute of Geography, an internationally renowned workshop of geography and earth sciences. In accord with the wide variety of research topics the local academic staff is involved in, the volumes give a picture of the whole cross-section of the discipline from geomorphology and biogeography to political, cultural and economic geography. Among the issues, multi-author textbooks as well as PhD dissertations and products of multi-party research projects are to be found.

The latest, 131st issue is also belonging to the last category: it contains scientific results that precipitated during a 2009–2010 research project initiated and financed by the city of Heidelberg. The book deals with the topic of creative work that has become a popular issue in social researches and is now regarded by decision-makers as a potential engine of economic growth. In particular, the volume focuses on the prospects of creative work in the city of Heidelberg that is living in a deep symbiosis with the oldest university of Germany.



While doing so, the authors not only pay attention to 'creative economy' in a narrow sense (including no more than cultural and creative *industries*), but consider all creative and innovative aspects of 'economic events'. A necessary consequence of this broad focus is a comparative evaluation of theoretical concepts on related issues, which forms the first thematic bloc of the volume. After the three-sector model investigating cultural production along types of sponsorship, approaches defining cultural and creative economies as a sum of strictly-defined economic branches are presented. Concepts concentrating on cultural value chains and Richard FLORIDA's concept on the *Creative Class* are also described and evaluated. Finally, a new theoretical framework is introduced: it basically follows the three-sector model in logic, but takes into consideration all sorts of creative work in all economic branches, while excluding not-creative activities within branches conventionally regarded as cultural and creative economies.

The theoretical introduction is followed by a thorough empirical analysis of creative economy in Heidelberg. First, the importance of public sector is presented. For German cities, a strong positive correlation between per capita economic production and per capita expenditures on culture is revealed. Heidelberg is also no exception, but has extremely high values in related investments. No wonder that high local demand for culture meets profound satisfaction with supply. More than half of all expenditures on culture, however, originate not from public sources. Therefore, the following chapter concentrates on the role of private sector in typical branches of cultural and creative economies. Results reveal a high proportion of those employed in these branches in Heidelberg compared to the national average. This is foremost due to a number of highly competitive companies in book and software markets, intensively cooperating with each other, and forming the backbone of cultural economy in Heidelberg; advertisement and architecture are identified as rapidly emerging branches. Although most enterprises are located in the historic old town of Heidelberg, they are strongly embedded in the regional market.

Statistics are even more remarkable if all employees belonging to the *Creative Class* are considered. This category includes almost two-thirds of all employees in Heidelberg. The high ratio can be traced back foremost to science, research and development. Here, the leading role is that of the 625-year-old Ruprecht Karls University with its 18,200 employees and 28,000 students, and gross expenditures reaching about 1.2 billion euros annually. Academic sector in Heidelberg, however, also embraces several colleges and research institutes. It means altogether 23,000 workplaces and 1.4 billion euros. With other words, the academic sphere is a decisive segment of local economy, and not only directly. The number of jobs only created by secondary effects of the university's expenditure can be estimated at some further 6,700 within the region.

The authors devote a whole chapter to the role of patronage. The issue is of especial interest since the old university town offers relatively few opportunities for art education. Unlike the nearby Mannheim, Heidelberg has no art academies; it is difficult for young artists to emerge. Moreover, the town that is well-known for high real estate prices due to limited supply offers few spaces for art activities. Thus, local creative production is reliant on patrons as well. In this sense, circumstances are optimal. Local households own a big and constantly increasing amount of assets; the relative number of foundations is similarly high. On the one hand, the latter phenomenon is to be thanked to several extremely rich persons, who are from and emerged in the region, and regard patronage of local culture their moral duty. On the other hand, this sort of philanthropy can also be seen as prudent investment; investment in creative projects of creative artists and creative researchers.

The latter category is especially important in Heidelberg: almost half of all philanthropic expenditures flow into science, which is an outstandingly high proportion in inter-regional and international comparisons. The authors reveal causes through network analysis. They show that the 68 local advisory boards in different spheres and branches are characterized by strong inner centre-periphery structures, where network centers are dominated by representatives of scientific life. In general, the volume can serve as useful and interesting reading for several reasons. The well-structured theoretical overview can be used well by those interested in conceptual issues of creativity and culture and their economic aspects. The detailed empirical analysis offers information for everybody who wants to learn more about practical issues of creative economy, about methodological challenges of conducting such researches, or simply about the city of Heidelberg. Hopefully the volume will give inspiration to decision-makers and researchers in other countries to finance and conduct similarly well-founded and useful case studies on the local economic importance of creative work.

Ferenc GYURIS

Jeffery, S. et al. (eds): European Atlas of Soil Biodiversity. European Commission, Publication Office of the European Union, Luxemburg. 2010.

The Joint Research Centre of the European Commission published a new soil atlas at the end of 2010. This is the third in the atlas series launched six years ago with the Soil Atlas of Europe (2005) and continued with the Soil Atlas of the Northern Circumpolar Region (2010). United Nations has declared 2010 to be the International Year of Biodiversity. On this occasion Joint Research Centre of the European Commission (JRC) and Directorate-General for the Environment of the European Commission (DG Environment) have produced the first ever a comprehensive atlas at European scale. More than 60 specialists of the JRC and the world leading experts in soil biodiversity were involved into the edition of this tome.

The Atlas of the Soil Biodiversity is not a conventional atlas than it rather is an encyclopaedia. It is designed to be a reference guide to life of soil, so it can be a useful tool for soil scientists and for higher education. The soil atlas is divided into two parts. Section one covers a wide range of topics related to soil biodiversity. Fundamentals of the soil environment, ecosystems and biomes, soil functions, threats to soil biodiversity, soil ecology, and the methodology are introduced from the perspectives of soil ecology and microbiology. The policies and the role of education are discussed by another chapter. Although the atlas officially focuses on Europe, the majority of the chapters have a wider scope.

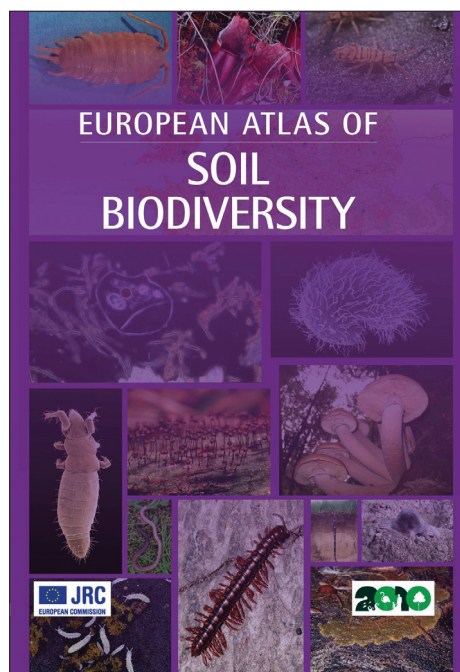
The conventional atlas appears in the 6th chapter: "Distribution of Soil Organisms within Europe". Section two is a taxonomical handbook of the soil organisms. This section contains up-to-date and more comprehensive knowledge than several available books in the field of soil ecology. Each section works independently of all other sections, to make

information readily accessible. For this reason some data are being shown recurrently. Some of the topics are more theoretical and abstract than the other ones, however, the extent of the chapters are balanced. Where the subject is complex and abstract, simple analogies and explanations appear in supplementary textboxes.

The language is easily accessible, but some terms can be unknown for the new reader. For this reason a glossary can be found at the back of the volume. The atlas is richly illustrated with figures and photos, and comprises one A/2, three A/3 and 13 A/4 sized map plates.

The European Atlas of Soil Biodiversity is freely available online at http://eusoils.jrc.ec.europa.eu/library/maps/biodiversity_atlas/

Zoltán SZALAI



Report on the 6th International Congress of the European Society for Soil Conservation (ESSC)

Thessaloniki, Greece, 9–14 May 2011

The 6th ESSC Congress was held in Thessaloniki, between 9 and 14 May 2011, in the Conference Center of the Grand Hotel Palace. Theodore KARYOTIS (Institut for Soil Mapping and Classification, NAGREF) as president of the Organizing Committee and his collaborators prepared everything for a successful congress in an exemplary way.

Most participants arrived on the first day and the conference began with an ESSC Council Meeting, followed by the opening ceremony and a cocktail reception. The presentation of the scientific papers and posters started the next day. The papers were classified into 6 sessions.

Session 1 on Policies and Thematic strategies started with a keynote lecture by C. KOSMAS about the indicators and thematic strategies for soil protection. Consecutive papers highlighted different effects of the topic emphasizing the importance of the interaction between science and policy making.

The keynote speech of Session 2 on Forest fires, impacts on natural resources and cultural heritage was given by J. RUBIO, who is a well known specialist of the subject. The subsequent oral communications discussed several aspects of this very important and interesting topic. In addition to the European presentations two papers from Asia were also included in this session.

The topic of Session 3 was Sustainable management of wetlands and drylands. D. GABRIELS and his co-authors put together an interesting and provocative keynote paper on the role of vegetative buffer strips and erosion dams as sediment traps. A wide range of various topics such as soil erosion and desertification studies was provided to the audience.

The introductory paper of Session 4 (Soil and water management under global climatic change scenarios) was given by S. RUNOLFSSON and his co-authors from Iceland on soil conservation in Iceland putting the issue in a European context. The session covered many of the aspects of soil and water management. In the session a large variety of conservation techniques were discussed. Presentations were not limited to the technical aspects of the methods. Several contributions discussed the carbon stock issue and some results obtained by modeling methods.

Session 5 on Conservation and management of soil biodiversity started with an introductory lecture on soil biodiversity given by P. PANAGOS representing also his collaborators. Only one paper given by myself discussed also avian biodiversity not only soil biodiversity. Carbon dynamics as a very up-to-date issue was also dealt with.



Photo 1. Professor José Louis RUBIO, past president, Professor Carmelo DAZZI, new president, Professor Edoardo CONSTANTINI, general secretary and Professor Theodore KARYOTIS, president of the organizing committee



Photo 2. Discussions in the audience



Photo 3. Participants of the scientific conference at BOUTARIS winery in the village of Stenimachos



Photo 4. A phantastic hospitality was provided by our Greek hosts, the local organizers. In the middle Professor Theodore Karyotis, the president of the Organizing Committee

The question of how to manage already degraded land and to foster education and public awareness were the topics of Session 6 (Restoration and remediation of degraded lands – Education in soil conservation and public awareness). The keynote of N. MISOPOLINOS and M. FULLEN presented by N. MISOPOLINOS concentrated mainly on salinization processes and remediation of Mediterranean soils. A wide range of papers was presented in this session.

A lively discussion followed each paper presented and the discussion continued in the poster room and during coffee and lunch breaks.

There was a one day excursion after four days of paper and poster presentations. First the participants visited the archeological site of Vergina where two hours were spent admiring the exposed objects of the tomb of Philip II, father of Alexander the Great. The golden larnax and the golden grave crown of Philip are the most fantastic pieces of jewelry I have ever seen. The second stop was a visit to a vineyard in the famous wine growing region of Naoussa. The vineyards of Naoussa occupy a total area of about 700 hectares, on the slopes of Mount Vermion at an altitude of 150–3,000 m a.s.l. The continental climate and the slopes provide ideal conditions for wine cultivation. An explanation about wine production was provided by the winery including some information on soil and water conservation.

Two council meetings were held during the congress. The most important decision of the council was to elect the new council, to nominate members of the Executive Committee including candidates for the positions of the president, vice presidents etc. The most remarkable event of the conference was the election of the new council and executive committee. Carmelo DAZZI was elected as the new president and Eduardo CONSTANTINI became the new secretary. José RUBIO is now past president, Ádám KERTÉSZ, Mike FULLEN and Peter STRAUSS are the vice presidents. Wim CORNELIS remained the treasurer and Donald GABRIELS the co-treasurer. Mike FULLEN retains the post of editor-in-chief of the Newsletter.

Each participant should be grateful to the organizers for a very well arranged congress. It was agreed that the following conference would be organized in Reykjavik, Island in four years.

Ádám KERTÉSZ

Report on the 2011 Annual Meeting of the Association of American Geographers

Seattle, Washington, April 12–16, 2011

The Association of American Geographers held its 2011 Annual Meeting in Seattle. This meant a great geographical shift after the 2010 Washington D.C. meeting in the life of probably the most popular and colourful conference of global geography. Nevertheless, the shift was worthwhile. Seattle enjoys the benefits of being enveloped in magnificent Pacific Northwest wilderness while being accessible via Seattle-Tacoma International Airport, important transcontinental highways and an international seaport. Seattle is a vibrant, cosmopolitan city with multicultural society, symbolised by economic actors like Boeing and Microsoft. Therefore, one could hardly imagine better place for geographers to meet and exchange ideas. The conference took place in downtown Seattle at two nearby locations: the Washington State Convention Center (WSCC) and the Sheraton Hotel. Onsite check in, the exhibition hall as well as breakout sessions and plenary sessions took place in the Convention center, while breakout sessions and many reception events were organised in the Seattle Sheraton.

As usual the AAG Annual Meeting provided a fantastic opportunity for making new connections and meeting geographers from all over the world with a plethora of backgrounds. The event was attended by more than 7,000 participants which is beyond impressive. Attendees could choose from great variety of activities and subjects at the AAG



Photo 1. The Washington State Convention Center in downtown Seattle

annual meeting. This conference offered something for everyone. In terms of courses alone, it offered a small phone book's worth of sessions, workshops, discussion forums and studies running the gamut on everything from environmental issues to geopolitical concerns.

The work of the conference was started by thematic sessions held already at lunch-time on Tuesday, 12th of April. The opening session took place in the Washington State Convention Center at 6:30 p.m. the same day. After the welcoming remarks of Douglas RICHARDSON AAG Executive Director, and Kenneth E. FOOTE AAG President, participants could follow contributions of the Presidential Plenary Session under the title 'Geography in the Changing Worlds of Higher Education: Opportunities and Challenges'. Speakers of the plenary included Duane NELLIS, President of the University of Idaho, Maresi NERAD, Director of the Center for Innovation and Research in Graduate Education at the University of Washington, and Orlando TAYLOR from The Chicago School of Professional Psychology's Washington DC campus. As experts of higher education but being non-geographers the plenary speakers expressed their views on the future of geography in the context of the changing role of the university in society. This is a highly relevant topic not only for American geographers but also for the whole world. The Presidential Plenary Session was followed by the opening reception, which provided the opportunity to see old friends and meet colleagues at the outset of the AAG Annual Meeting. The keynote plenary of the conference was delivered by Barry LOPEZ winner of the US National Book Award with the title "Geography and the Humanities" on Friday, April 15.

From Tuesday noon till Saturday afternoon there were myriad of sessions organised in a broad spectrum of topics. Examples are discussions of how to think the immensity of climate change and biodiversity loss or how to rethink the current political landscape and systems. These questions were not only tackled in paper sessions and panels, but also by the lectures. For instance, Nigel THRIFT's presentation, 'The Insubstantial Pageant:



Photo 2. Insight into the exhibit hall

Producing An Untoward Land', clearly reflected his struggle to encounter recent economic and cultural changes on more than just analytical grounds. Similar concerns were addressed by Neil SMITH, who, in his lecture on ideology gave the example of the 'Arab Spring' and how it achieved an opening of the future for the whole world and an opening to imagine different futures – a sentiment which, he stated, had not been there in the past few decades. Asking questions such as 'where do ideas come from?' SMITH reminded the audience to think about everyone's potential agency in such creative processes.

Several sessions addressed geographical phenomena of the post-communist countries. Among them perhaps the most popular and most attended was the session on 'Critical geographies of post-communist cities' sponsored by the Russian, Central Eurasian and East European Specialty Group. The session was organized by Jessica K. GRAYBILL and Megan DIXON, and it took place in three subsequent paper sessions and a panel session. In the papers sessions thirteen papers were presented with a large spectrum analyzing the changing symbolic spaces, the suburbanization, or the new housing forms and their related social conflicts in post-communist cities. In the final session panelists expressed their views on legacies and current trajectories of urban development in the post-communist world.

A vital part of the AAG conference was the exhibit hall in the WSCC, where attendees could see the latest tools in teaching, field research, graphic applications, computer modelling, and data collection and analysis in geography. It was an extremely rich and diverse exhibition with 66 exhibitors, among them leading publishers in geography like Ashgate, Elsevier, Wiley, Oxford University Press and Routledge with the hottest textbooks and publications. In addition, we could learn a lot about the most recent technical advances in geography, including cartography, GIS and GPS, being represented by such renowned organisations like Google, NASA, or the US Army Geospatial Center (AGC).

This was thematically an extremely rich and diverse conference in an inspiring environment. The next AAG Annual Meeting will be held in New York City February 24–28, 2012. According to the expectations of AAG staff, the number of attendees will go upwards of 10,000, thus we can expect an even more extraordinary meeting of the American and international community of geographers.

Zoltán Kovács

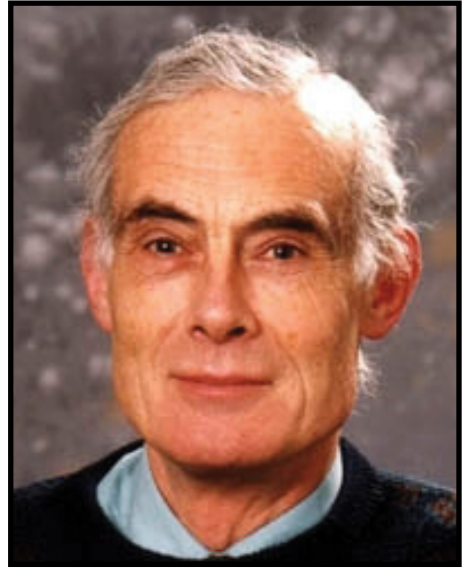
In memoriam David Turnock (1938–2011)

I was proposed to give an overview of David's academic career, in particular, his contribution to understanding the changing geography of Europe. Nevertheless, dwelling upon my memories of our joint work and our chats about history, Eastern Europe, family and so many other things, I decided to write about the friend, who was a dedicated researcher, a tutor and also a kind, helpful colleague for all of us.

We all know his systematic way of exploring socio-spatial processes in his study-areas, such as in Leicestershire, Scotland, the Carpathian regions of Romania and in many other places... Nevertheless, he was always anxious to go deeper and understand the historical, social ("macro-") and environmental contexts of local processes. As he wrote in 1998, "...The distinctiveness of different world regions has always been the primary stimulus of my interest in geography, though such an inclination was hardly popular during my undergraduate years when overarching theories were very much in vogue and a focus on real world situations won few friends" (TURNOCK, D. 1998: 129). Nevertheless, in the milieu of theoretical plurality of the 1990s, when *agency* was a widely discussed issue, his view of socio-spatial processes that rested on understanding macro-structures through local actions and problems was increasingly appreciated. He found a sound basis for linking local and other scalar processes in the *realism*. From the mid-1990s, he focused largely on revealing global and national political, institutional and ideological context, as well as on the path dependency of regional and local processes, particularly, in post-socialist countries.

As a scholar, researching backward regions, he understood clearly how inequalities are reproduced in all spheres of everyday life. He acted as a moral man had to (as we all, social scientists should): he supported East European colleagues by sending and carrying books to them, and people living in the poorest regions of the Balkan (mainly, in Romania) by taking medical supply, blankets and toys year by year. His humanitarian activity had been supported by his wife, Marion for four decades; their blue Ford was always full of charity supply when they visited us in Békéscsaba. Their work in the Caledonian Society that supports Scottish culture reflected the same devotedness that tied up his professional and "civil" life (David got his first job as a university professor in Aberdeen).

David TURNOCK has been a well-known colleague and a friend to many East European geographers since 1970. He was one of the few scholars who did empirical research on the spatial logic of the centrally planned economy and of the political system of socialism. The primary field of his studies was Romania. His papers and books that revealed social inequalities and environmental conflicts under socialism, and their historical contexts rested on his field work and personal experiences, moreover, on the extensive network of



“local” academics that was kept working by David. We were often invited to check and criticise his papers – to interpret facts and processes always in the right cultural context.

It was David TURNOCK and his colleague and friend, Frank CARTER, who proposed to set up the *Socialist Geographies Research Group* within the Royal Geographical Society (RGS), to support academic relationships across the iron curtain. The research group did survive the collapse of socialism, now exists as *Post-socialist Research Group/RGS*, and still fulfils its function, linking geographers in the East and the West of Europe. His work was recognised by the RGS Edward Heath award in 1989.

In the transition period, his encyclopaedic knowledge, writings and academic relationships did shape the main streams of geographical research focused on East Central Europe and the Balkan. Working together with East European scholars (writing joint papers, editing volumes of studies) he studied key issues, such as the historical contexts of institutional transformation, foreign investments and uneven spatial development, the crisis of rural regions, environmental conflicts and cross-border relations. The joint work, in my experience, rested on mutual appreciation of each other’s knowledge and opinion, lacking the frequently experienced imbalance in East–West academic relations.

Who was David TURNOCK for us, East European geographers, and why do we miss him as a colleague, a friend, a mentor, a precise editor and in many other terms so much? By the pure facts, he was a scholar who accumulated and organised an immense and deep knowledge about our region. He presented his results on East Central Europe and the Balkan, moreover, on his other “long-term research projects” (e.g. on Leicestershire, and on the Scottish Highlands) in his more than 31 books (including 10 volumes of studies edited by him) and hundreds of papers. After finishing his studies at St. Catherine’s College, Cambridge, and getting his PhD shortly after, he was invited to teach at the University of Aberdeen. In 1969, he moved to Leicester, and worked at the University of Leicester until his retirement in 2003. His books (many of those were on the reading lists at the Department of Geography), moreover, his way of working together with students as a tutor inspired many young fellows to find their own way – and often, to study and to understand Eastern Europe. Being retired was not an end to his work, but having more time for exploring Europe and for writing his books: he had six synopses that had been accepted by major publishers in 2003. He left several manuscripts behind that he could not finish – when we lost him in a car accident on 10 May, 2011 in Rutland.

It was an enormous loss, and now we miss a dedicated colleague, a friend, a mentor – a good man...

TURNOCK, D. 1998. Globalisation and the East European transition. *Geojournal* 45. (1–2): 129–140.

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