

REPORTS

The International Scientific Conference 50 Years of Geography at the Faculty of Science, Palacký University in Olomouc

On 10th and 11th June 2009 the Department of Geography at the Faculty of Science, Palacký University in Olomouc arranged the international scientific conference on the 50th anniversary of its founding. The programme of the relatively broad-based celebration included the meeting of geography graduates of Palacký University (27th June 2009), attended by 150 former students, and publishing the “History of the Department of Geography at the Faculty of Science, Palacký University in Olomouc” presenting the most important stages of the Department development to a wide geographic public.

The UP geographical department was founded by prof. Vitásek shortly after its renewal in 1946. Prof. Vitásek led the department a few years and till the mid 1950s it changed its organizational form several times. Initially it had the status of a separate geographic institute which was later included into a broader system of all the science-oriented departments of the Faculty of Education. After its later split this workplace was part of the Department of Biology, Geography and Geology, and later the Department of Geology and Geography. Even within the existence of “broader” departments, the geographical work-place preserved its administrative and especially research autonomy. After the implementation of the university reform in 1953 the university was reorganised. Geography was transferred to the Faculty of Natural Sciences of the newly established University of Education and after the next reorganization in September 1958 it returned at the Faculty of Science of Palacký University.

The independent Department of Geography was established on 1st May 1959. The main objective of the Department, as well as the whole Faculty, was the education of secondary-school teachers of geography. After 1989 the Department changed its specialization. It gradually abandoned its one-sided orientation and started to develop Geoinformatics

(studies opened in 1997), International Development Studies (2003) and the study of Regional Geography (since 2006). In the period after 1989 the Department has noticed a significant increase in scientific research activities and intensification of its contacts with partners, especially abroad.

The conference on the 50th anniversary of the Department was held under the auspices of the Rector prof. Lubomír Dvořák, Dean of the Faculty prof. Juraj Ševčík and mid-Moravian branch of the Czech Geographical Society and it took place in the premises of the Art Center UP (Konvikt). At the opening ceremony of the conference, commemorative medals were awarded to emeritus members of the Department in recognition of lifelong contribution to the Department reputation. These awards were presented also to the members of the “founding” generation such as doc. Stanislava Šprincová, the main representative of Czech geography of tourism and recreation, and in memoriam doc. Vladimír Panoš, a significant carsologist and speleologist. Neither the contribution of the “second” generation of geographers in Olomouc was forgotten. The medals were awarded to the prominent Czech geomorphologist prof. Jaromír Demek, who led the Department in Olomouc from 1988 to 1995, and also doc. Miroslav Pluskal and dr. Ivan Lepka. The next group of awarded people included representatives of Czech and Slovak geographical departments and institutes, as well as cooperating departments from Slovenia and Poland.

Not only the social but also the professional programme of the conference was really rich. More than one hundred geographers from five countries came to Olomouc to actively participate in the conference, among them all Czech and Slovak geographical departments, including the presidents of the Czech Geographical Society and the Slovak Geographical Society – doc. Siwek and prof. Matlovič.

In the plenary session three key note speeches were given: Physical geography - a vision of Czech science for the 21st Century (Karel Kirchner, Jaromír Kolejka), Behavioral geography as a part

of geography with evident and productive approaches (Vladimír Ira) and Spatial analysis of the birthplaces of geography professors in the Czech Republic (Tadeusz Siwek). Discussions were subsequently divided into three sections: physical geography (17 contributions); social and economic geography (61 contributions); geographic education, cartography and GIS (18 contributions).

The physical geography section debates focused thematically on the geoecology and landscaping, less discussed topics represented lectures on hydrology, climatology, geomorphology and pedology. The section of social and economic geography traditionally contained the highest amount of contributions. Delivered speeches included all the basic disciplines of the field, the regional disparities research, integration processes, regional policy enjoying greater interest, and a separate group was formed by contributions dedicated to the rural area. Regarding the geographic education, cartography and GIS section six papers were presented on the issue of geographic education; the remaining eleven contributions were concerned with cartography and GIS. In a separate poster section 21 research results were presented. The conference itself was naturally an opportunity for informal meetings, exchange of experience and preparation for further cooperation between the representatives of presented geographic departments.

On the occasion of this conference realization, the university published the abstracts proceeding and the conference proceedings with full texts of presented contributions will be available in autumn 2009.

Tomáš, M., Vysoudil, M. eds. 2009: *Mezinárodní vědecká konference k 50. výročí geografie na PFF UP v Olomouci, Olomouc 10.–11. 6. 2009. Sborník abstraktů.* Univerzita Palackého v Olomouci, Olomouc, 135 s.

Fňukal, M., Frajer, J., Šerý, M., Toušek, V. 2009: *Historie katedry geografie na Přírodovědecké fakultě Univerzity Palackého v Olomouci.* Univerzita Palackého v Olomouci, Olomouc, 60 s.

Miloš Fňukal

Current Research in Human Geography at the Department of Geography, Palacký University Olomouc

The Department of Geography of the Palacký University Olomouc participates since the beginning of 2009 in three projects granted by either of the two Czech grant institutions. All projects are concerned with various aspects of the spatial organization of the geographical environment.

Significant social, economic and cultural transformations have occurred in the Czech Republic since 1990 and these transformations are reflected in the lives of the Czech population. The complexity of the spatial behaviour dynamics is enhanced by individual motivations and interests, personal social-demographic characteristics and cultural, political, economic and technological factors at the macro level. The principal objective of the Czech Science Foundation project (no. 403/09/0885) *“Spatial models of behaviour in a transforming urban environment: a time geographical approach”* is to verify whether new phenomena appearing in the inner city structure after 1990 influence the spatio-temporal models of human behaviour and whether these models can contribute to municipal planning. The analysis pursues preferably the phenomena (i.e. “innovations” spreading in space and time) with a high leisure time potential, typically the shopping malls or leisure centres, and population segments with a high amount of leisure time, high level of adaptability to the innovations and also relatively higher degree of social and economic dependence (students, women on maternity leave, and seniors). The project is essentially based on the theoretical assumptions and methods of the time geographical school, particularly the use of space time activity budgets recording the daily trajectories of the individuals and the identification of their constraints. Phenomenological context and in-depth analyses of the human behaviour are surveyed as well. The research is carried out in four cities (Brno, Ostrava, Olomouc and České Budějovice) and four other institutions are involved (Department of Regional Economics and Administration, Masaryk University Brno, Institute of Geonics AS CR, Brno branch, Department of Geography and Regional Development, University of Ostrava, and

Department of Geography, University of South Bohemia, České Budějovice). As the Czech social sciences currently lack a complex research of the spatio-temporal human behaviour we expect, apart from completing particular case studies, also the formulation of generalised theoretical-methodological background that could be used in other similar researches.

Daily urban systems as a special case of a functional region are analysed within The Grant Agency of the Academy of Sciences of the CR project (no. IAA301670901) ***“Spatio-temporal organisation of daily urban systems: an analysis and assessment of selected processes”***. Interactions between a core and a periphery of a region organising a daily urban system must occur on a daily basis (i.e. a daily trajectory of an individual or a group of individuals) and exceed a minimum intensity. The project has two main intentions: 1) to use the interaction based on retail services commuting (either real or modelled) for delimitation of daily urban systems and 2) to analyse the internal structure of these areas on the basis of daily trajectories or cycle of individuals. Such a pursuit of internal structuration of a daily urban system has not been very frequent in geography but it has its internal logic since the time span (i.e. one day) is usual both in the studies delimiting daily urban systems and in many studies, especially time geographical, on daily activities of individuals. The full research is carried out in two regions organised by the cities of Brno and Olomouc. However, the delimitation of the daily urban systems is going to concern the whole territory of the Czech Republic. In this project the Department of Geography cooperates with the Department of Regional Economics and Administration, Masaryk University Brno. The expected research results could provide the general insight into spatial expression and reflection of the social and economic transformation processes that have shaped our country since the end of the 1980s and could make a contribution to the regional planning.

The Grant Agency of the Academy of Sciences of the CR project (no. KJB300860901) ***“Quantitative methods and synthesizing graphic methods in approximation, projection and***

modelling of geographical phenomena” is concerned with more theoretical and methodological issues of a spatial organisation, though it provides the examples of the application of selected methods. Basically the project involves the discussion and application of the spatial interaction models and the question of graphical expression of the results. Methods leading to fulfilment of the objective are diversified. They can be divided into two basic spheres – quantitative methods in approximation, projection and modelling of geographical phenomena and synthesizing graphical methods in approximation, projection and modelling of geographical phenomena. Partial objectives of the project, both methodological and application, include for instance the regional of the Czech Republic and identification of nodal regions based on the labour commuting and confrontation of this regionalization with existing socio-economic geographical regionalizations, the application of the spatial interaction models on the national level and their use in geographical differentiation of space, the assessment of influence of barrier effect of borders and environmental line components on the organization of socio-geographical space in selected model regions, the construction of synthetic graphical expression of spatial organization of model regions by adequate graphical tools, or the verification of possibilities of alternative definitions of masses and distances in the spatial interaction models and their calibrations. The project is solved in cooperation with the Brno branch of the Institute of Geonics of the Academy of Sciences of the Czech Republic. The project has wide opportunities of practical use for planning and revision of partial components of the geographical organisation of the society (e.g. the correction and optimization of the administrative division, planning and optimization of communication network at the national and regional level etc.). Stress on the natural spatial interaction can contribute to more precise and effective proposals of the strategies of regional development.

Pavel Klapka

Physical and Environmental Geography at the Department of Geography, Palacký University

Last several years saw the favourable scientific development in the field of physical and environmental geography at the branch of physical geography of the Department of Geography of the Palacký University in Olomouc. The fact that young workers, who also gained their PhD's for their work, considerably participated in this research is very promising to the future.

Environmental historic issues related to the surface runoff were solved by Pavelková Chmelová (2006) in her work, published as a Ph.D. thesis, on **environmental and historical analysis of land use changes and their effect on surface runoff in the catchment**. Parts of the thesis were also published in journal and conference proceedings (Chmelová, Šarapatka 2002, Chmelová, Šarapatka, Pavka 2006, Chmelová et al. 2006). Extensive land exploitation by over-intensified agriculture in the past has decreased natural retention and accumulation capacities of catchments areas in the Czech Republic. Many natural barriers to surface runoff have been removed; inappropriate land use, namely incorrect agricultural and forestry practices such as monoculture cropping in both fields and forests, along with the effects of heavy machine induced soil compaction have significantly decreased infiltration capacities (Kovář et al., 2002).

During the evaluation of serious flood events which have taken place in the Czech Republic in recent years, one of the proposed, and much disputed reasons for the severity of the floods, is that of a decreased retention and accumulation function in the of landscape. The effect of „flash floods“ affect smaller areas, either at the catchment or subcatchment scale. The point is that appropriate measures taken in land use might be able to moderate flood severity and thus, the subsequent consequence both to the built environment on which humans are directly dependent and the environment in general. The destructive effects of „flash floods“ tend to impact agricultural catchments, especially those with insufficient land cover that has had intensive runoff generation and where there are insufficient soil infiltration capacities.

Land use changes that have occurred during the last eight decades in the subcatchment of the Krupá river basin were analyzed. The analysis of both aerial photographs and databases from archival data containing cadastral units, cadastral maps and old forestry maps was the first step. The second step was to estimate, through simulation, how the runoff processes in the Krupá river catchment have been influenced by land use changes. The historical development in this period was described in two parts beginning with the displacement of the German inhabitants after the Second World War and ending with a description of post-1989 agriculture.

The DesQ hydrological model and the CN method were used to simulate the effects of these land use changes on the runoff processes. The DesQ hydrological model is used to calculate the maximum water flow in unobserved small watersheds. These small watersheds are those where there is insufficient number of hydrologic stations. The parameters we can change in DesQ model are various, but we have chosen to focus on differing rainfall and land use patterns. CN (curve number) values are in a range between 0 to 100, higher CNs are associated with higher runoff potential watershed. The CN is usually estimated from handbook tables that list land use, hydrological soil group and the antecedent moisture condition. The Krupá river catchment (left tributary of Morava river) serves as the general study area. The Krupá river has a total drainage area of 112 km² and its length is 23 km.

Runoff conditions in the catchment can be assessed by CN. The CN was calculated for the upper reaches of the Krupá river in 1930 and 2002. Runoff conditions were significantly changed due to land use changes in those years. In 1930 forest areas covered only 2.619 ha compared to 4.393 ha in 2000. Changes of age structure and species composition of forest are reflected in the CN. Generally speaking, arable land and pine monoculture areas have a higher CN. In regard to runoff conditions some agriculture areas in 1930 transformed to forest in 2002 indicate worse hydrological conditions. These examples show us that the surface runoff can be influenced by land use changes. The CN formulation was used for

further hydrologic calculation e.g. HO surface runoff (mm) and A potential maximum retention (mm).

The environmental issue of the air quality is being solved by Martin Jurek. His long term interest and research in this field resulted in the dissertation on the **air quality in the district of Olomouc and trends in atmospheric pollution in 1981-1990 and 1991-2000 as a response to structural changes in industry (with the utilisation of GIS tools)** (Jurek 2007b). The aim of his research was to analyse the development in air pollution levels bound to the background of industrial sources. The timeframe of this study was equally divided between the late period of a centrally-planned economy in the socialist Czechoslovakia and the early years of an emerging market economy. The Czech emissions inventory records for the large sources of air pollution as well as air pollution levels from two monitoring stations were examined to detect and assess the hypothetical trends. Three-year moving averages and the Mann-Kendall non-parametric test were applied to air pollution levels averaged over a period of one year as well as over two distinct seasons: warm (April to September) and cold (October to March). All the large sources of air pollution as recorded in the national emissions inventory were spatially identified and sorted into seven functional groups according to the frequency of occurrence in the district of Olomouc and considering the prevailing technology with an effect to air pollution (heating plants, smelting of metals, manufacturing of machinery, food processing, extraction and processing of raw materials, agricultural production, other types of manufacturing). The emissions inventory was analysed with respect to the seven functional groups to find out the trends in emission levels for the distinct groups of sources. Using GIS tools the emissions were spatially encoded to a 2 km × 2 km grid overlay of the district of Olomouc, this way being visually presented to demonstrate the changing intensity and distribution of emissions within the district.

The main findings of the study are the following: the air pollution levels of suspended particulate matter as well as of sulphur dioxide decreased over time, while no general trend was detected for

nitrogen oxides. The group 'heating plants' was recognized as responsible for the major part of total emissions from the large air pollution sources, especially the central heating plant in the city of Olomouc was detected as a source capable to overrun all other changes within the structure of annual emission totals. Three more groups were assessed as significant: 'smelting of metals', 'manufacturing of machinery', and 'food processing'. Generally decreasing trends in annual emission totals over the period 1981-2000 were detected. With the 'heating plants' a general upgrade in technology and partly in the fuels used was interpreted as the major cause of the observed reduction. For the other three significant groups a synergic combination of investment into technology and reducing the production due to its obsolescence or lack of competitive strength was identified. The emissions were spatially distributed into five stable clusters of grid-cells, representing the city of Olomouc, the towns of Litovel, Uničov, Šternberk, and the municipality of Hlubočky. The overall values of emission densities were identified as decreasing over the studied period.

Partial results of the Ph.D. thesis were published in scientific journals and conference proceedings (Vysoudil, Jurek 2004, Jurek 2004, 2006, 2007a).

Research in fluvial geomorphology and biogeomorphology is a domain Blanka Loučková. Her Ph.D. thesis (Šaňková 2008) deals with **bottomland vegetation in relation to fluvial geomorphic landforms in near-natural river reaches in Hrubý and Nízký Jeseník Mountains**. Field surveys were conducted in permanent plots located along transects perpendicular to a stream channel in five reaches of the Opava, Černá Opava and Branná rivers. In each of plot, the following characteristics were collected: the percent canopy cover of each vascular plant species present (using Zlatník's scale), landform type (alluvial gravel bar, vegetated island, riverbank, floodplain, terrace), height above channel, distance to channel, sediment-size characteristics, slope, aspect and width of floodplain. In twenty-one plots also soil pH, soil enzymatic activity and dry matter content were measured.

At first, vegetation data collected in 2007 (relevés from 71 study plots) were statistically analyzed using ordination methods to search for a pattern in species composition and to determine which of the measured variables are the main factors influencing the woody and herbaceous vegetation. The binary discriminant analysis was used to reveal significant association of species with specific type of fluvial landforms. The results of both direct and indirect gradient analyses suggest that the key environmental determinants of riparian vegetation variation are the fluvial-geomorphic surface, width of the floodplain, distance to the river channel and altitude. In case of herbaceous vegetation (woody and herbaceous vegetation were treated separately) also the difference in elevation above the channel bed has a significant influence on vegetation composition. The binary discriminant analysis revealed that numerous species can be associated with specific type of fluvial landforms. Herbaceous and woody plants identified along study reaches were classified into four groups according to their bottomland occurrence based on performed analysis and field investigation. The vegetation composition on dominant geomorphic surfaces (bar, island, bank, floodplain, terrace) was described.

The investigation of the species richness of riparian vegetation in relation to fluvial landforms revealed clear trends in diversity along the studied reaches - species richness per site (number of species for each fluvial landform) was generally highest on the floodplain and decreased gradually to the channel bed and to the terrace. The comprehensive three-year monitoring (2005-2007) of vegetation dynamics in 49 permanent plots on three transects on the Opava river (147 relevés) is presented in second research chapter. For more detailed survey, individual habitat types were distinguished on fluvial geomorphic surfaces. The year-to-year changes in woody and herbaceous cover and in number of species on different habitat types were closely evaluated and displayed in sets of graphs. The final chapter focuses on vegetation recolonization on different habitat types after major flood disturbance (July 1997) in the course of ten years on the Branná river. In three repeat sets (2000, 2005, 2007) were obtained 21 relevés, the vegetation has been described and the

successional changes were analysed. Various spatial and temporal patterns of recolonization were determined by the analysis of vegetation reestablishment on adjacent quadrats located along transects.

Partial results of the research on biogeomorphology and fluvial geomorphology were also published in journals and conference proceedings (Hrádek, Loučková 2009, Šaňková 2007, 2008).

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Pavel Klapka

REVIEWS

Těžba nerostných surovin na území ČR a její geografické aspekty [Extraction of mineral resources in the Czech Republic and its geographical aspects]

by Irena Smolová.

Olomouc: Univerzita Palackého v Olomouci, 2008.

This publication has been so far missing at our book market. It was partially caused by the fact that the issue of spatial changes in the extraction of mineral resources after 1989 was not a subject of research interest of the Czech geography. In geographical literature only partial themes were solved, complex approach being presented just in the reviewed monograph. Chosen methodological approach of the author, associate professor at the Department of Geography, Palacký University, is very successful. In the introduction to the study she deals with a resource potential of the Czech Republic, then she draws attention to historical aspects of the extraction of the mineral resources, takes into account the legislation of the extraction and then discusses the transformation of the mining industry after 1989 and the development of the extraction of individual resources in 1990-2006. Inclusion of the chapters on contemporary situation of the Czech Republic and the extraction of mineral resources in the world and on economic effect of the extraction of the mineral resources on the regional development is also very favourable. The author in the monograph proves that she is an erudite specialist in this issue, which is confirmed also by a number of published articles or communications both at domestic and international conferences. Particularly her emphasis on the revealing of the causes of the present state can be positively assessed. The monograph pays special attention to the role of the foreign direct investments in privatization and later transformation of the mining companies.

We can agree with the author's statement that the Czech Republic possesses despite its small area relatively rich resource base. The history of their extraction witnesses that the mining has been widespread in the Czech lands and reached very good level. In the past gold, silver and other ores

were mined. The Czech production was by its extent at peak European levels. Variety and richness of some mineral resource deposits significantly affected later industrialization of the Czech lands. Thanks to wide resource basis and sufficiency of energetic resources the Czech lands belonged at a time among the most industrialized regions in Europe.

The development in 1948-1989 was influenced by the centrally planned economy, which was logically reflected in the whole economy of Czechoslovakia. The economy was oriented at heavy industry (metallurgy, machinery, metal working), which demanded strongly for a large amount of mineral resources. Not only the extraction was enormous, but in many cases it was at the very level of economic rentability or even under that level (particularly ores and hard coal). In many places of the Czech Republic the extraction had an extensive and exploitative character. Central bodies did not care about the effects on landscape. As late as in the 1980s and particularly after 1989 the slump programme was fulfilled in case of ores, coal and a number of other mineral resources, which under new economic conditions were not competitive.

As the author notes, the total extraction dropped significantly with the most of the resources. For instance in comparison with 1989 the hard and brown coal extraction decreased in 2006 by 50-60%, the extraction of the uranium dropped even to 7%. In the Czech Republic the extraction of the polymetallic ores was finished in 1993. Adequately to the extraction development also the area and number of mining spaces dropped significantly. Extraction of practically all mineral resources follows today the rules of the market economy, which is being significantly helped by the presence of international companies, which export the resources to the international markets. The monograph pays attention also to this issue.

I suppose that the publication of Irena Smolová can interest a number of specialists dealing completely or partially with the issue of the mineral resources. The publication has for university students, particularly regional geographers, even

the character of the textbook. The students can use the acquired knowledge in a number of partial geographical disciplines, such as for instance the geography of industry, geomorphology etc.

Václav Toušek