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7th SYMPOSIUM ON WATER TRACING
Portorož, May 26th - 31st, 1997

Many important meetings have been organised this year at Portorož, including the meeting of the Central European presidents. Among the professional meetings the 7th SWT was without doubt one of the most important. Under the simple name of symposium it was in fact the world's congress of specialists, using tracing techniques for water research. Already the fact that these symposia are held every fifth year confirms the importance of the event.

The five years which elapsed from the previous symposium (at Karlsruhe in 1992) were needed for the preparation of this one. First, it is necessary to say that the SWT symposia are not simple meetings where the specialists gather and discuss some topics. For the SWT a group of specialists belonging to the ATH (Association of Tracer Hydrology) choose appropriate karst terrain where they are trying different, if possible new, tracing techniques and methods. The results of these field experiments are the essential part of the symposium. Of course the report about the experiments has to be published, too, prior to the symposium, and the publication distributed to the participants. In 1992 at Karlsruhe the Slovene researchers, members of the ATH, offered to prepare the next, 7th SWT and to use Trnovsko-Banjska Planota karst plateau as a test area. Trnovsko-Banjska Planota is very important for Slovenia when drinking water reserves are taken into account. An ATH team came to Slovenia to visit the terrain and to discuss it with Slovene colleagues and according to the conclusions the organisation of the 7th SWT was assigned to Slovenia.

Here a special project *"Transport of pollutants in karst: tracers and models"* was launched, co-financed mainly by Ministries of Science & Technology and of Environment & Physical Planning. In the frame of the project over 50 researchers of different professions (hydrogeology, hydrology, geology, physics, chemistry, geography, meteorology, etc.) coming from 18 institutes (Austria, France, Germany, Switzerland and Slovenia) investigated the waters of Trnovsko-Banjska Planota and their underground connections.

In 1995 the project was concluded and 1996 was used for analysing and interpreting the results and for preparing the final report. This was published in a special number of *"Acta carsologica"* (edited by Karst Research Institute at Postojna), no. XXVI/1 under the title *"Karst Hydrogeological Investigations in south-western Slovenia"*, on 400 pages. The first part of the report presented basic data about Trnovsko-Banjska Planota (physical geography, hydrology, meteorology, geomorphology, speleology, geology, hydrology, water quality,

karst springs' fauna, vegetation). These data were not just gathered but for some of them special research was needed (detailed geological mapping of the Vipava and Hubelj springs, precipitation, evapotranspiration). The essential part of the publication contains the results of the project investigations: water balance and hydrogeological and hydrochemical investigations. Special attention was focused on the so-called "short events" (water pulses after heavy rain or snow melt) which is a new approach and very important in studying the processes. Taking into account that isotopes are a sort of "natural tracer", a very appropriate one, these investigations played an important role in the project. The gist of the publication are the results of water tracing in the recharge area of important springs (Vipava, Hubelj, Lijak, Mrzlek). All the tracing experiments were combined, i.e. different tracers were injected simultaneously into the swallow-holes, sinkholes, and shafts on the Trnovsko-Banjska Planota. Besides the answers to scientific and methodological questions, the results are very important regarding underground water connections in the frame of the Trnovsko-Banjska Planota aquifer. The knowledge of the connections is essential for the protection of the aquifer.

The results of the project can be very useful for water managers and for water users, that means for all the inhabitants of the Trnovsko-Banjska Planota surroundings (Vipava valley, Nova Gorica and Idrija regions), as well as for the karst water specialists, who are using (or have to use) tracing techniques. At the same time the project and its publishing is a promotion of the Slovene research and science.

Publishing of the *"Karst Hydrogeological Investigations in south-western Slovenia"* was only one of the tasks the organiser, the Karst Research Institute, had to fulfill. Before the beginning of the symposium the proceedings had to be published, too. To enable the participants of the excursions to follow the routes more easily, a small (100 pages) *"Field Guide of Karst in Slovenia"* was prepared also. The symposium's proceedings *"Tracer Hydrology 97"* which contain 63 papers (grouped in 5 chapters) on 450 pages, were published by Balkema, Rotterdam.

When all this work was done (we found out that five years is not such a long time), the symposium could start. In the Convention Centre of the hotel Emona at Bernardin (Portorož) over 160 registered members gathered from 17 countries. Together with the occasional (non-registered) visitors, there were over 180 participants. Most of them came from all over Slovenia, from Germany and Austria. The rest were from European countries, from Malta to Ireland, from Spain to Slovakia. Specialists from other continents were present, too, from Brazil to China. It is necessary to mention that much more interest in attending the symposium was shown specially from the countries with economic problems

(India, Russia, Ukraine), but the organiser could not help them by other support than to exempt them the organisation fees. In the future such meetings should be organised with the help of an international organisation which can provide some money for such purposes (UNESCO or EU). Specialisation of the participants was very high, considering that more than half of them were doctors in science. Young researchers (young by age) formed quite a large proportion of the members, due also to the reduced fees. Despite the proximity of the sea and nice weather, all the lectures were attended by more than hundred listeners, which showed the quality of the papers and their interesting topics.

The symposium was opened on Monday afternoon, May 26th, by the state secretary of the Ministry of Science and Technology F. Demšar. Greetings were expressed by the organiser, representative of the Municipal Council, general sponsor, president of ATH, representative of the Ministry of Environment and Physical Planning, and by the president of the Karst Commission of the International Association of Hydrogeologists. On the first day only one paper (but lasting over one hour), the report on the Trnovsko-Banjska Planota project, was presented by P. Habič, the president of ATH. The next three days were fully occupied by professional papers, except one afternoon when the participants visited Kras (Classical Karst) and Škocjanske Jame caves. During three days, 42 papers and 23 posters were presented. Papers were grouped into six thematic sections: methods, surface water, unsaturated zone, aquifer, transport of pollutants and protection, aquifer characteristics, and modelling. It is impossible to mention all the papers and posters. Directly or indirectly all of them talked about water tracing, but were very different in details; from the papers which treated tracers to those which treated the study (by tracing methods) of waste water flow into the sea and pollution of groundwater by nuclear power plants.

About 30% of the participants (and 15% of the authors) were from Slovenia.

Their contributions were in the section on methods: Movement of bacteriophage and fluorescent tracers through underground river sediments (Bricelj & Mišič), Laboratory tracer experiments in carbonate porous media from Slovenia (Čenčur Curk, Obal, Kogovšek & Veselič); on the unsaturated zone: Water tracing tests in vadose zone (Kogovšek); on aquifers: Experiences in monitoring the Timavo river (Classical Karst) (Cucchi, Giorgetti, Marinetti & Kranjc), Properties of underground water flow in karst area near Lunan in Yunnan Province, China (Kogovšek, Liu & Petrič), Preliminary results of the submarine outfall survey near Piran (northern Adriatic Sea, (Malačič & Vukovič), Water balance investigations in the Bohinj region (Trišič, Bat, Polajnar & Pristov), Advanced methods of tracing in several Slovenian karst aquifers by using the natural light isotope characteristics

(Pezdič), On the role of clay-carbonate reactions in the speleoinception - advanced theory of the earliest stage of karst channels formation (Pezdič & Šušteršič); on pollutant transport and protection: Agriculture - Potential polluter of waters in karst region in Slovenia (Matičič), Development of a tracer test in a flooded uranium mine using *Lycopodium clavatum* (Wolkersdorfer & Trebušak & Feldtner). The papers prepared by Italian, German and Chinese participants in co-operation with Slovene authors proved that Slovene researchers are involved intensely into the international research sphere.

The symposium was also an opportunity to acquaint foreign participants with karst in Slovenia, focused upon karst waters and the results of Slovene field research, which was achieved through the excursions. For the participants from Slovenia, the main topic of the excursions were problems of karst water protection. The highest interest was shown for the Trnovsko-Banjska Planota, where the test area of the project was shown and explained. On the way through Nova Gorica, the participants visited the headquarters of the general sponsor HIT. The second excursion was devoted to the upper Ljubljana river basin focused upon karst poljes, the test area of the 3rd SWT (1976). The third excursion led the participants to the less known part of Slovene karst, to the karst of Dolenjsko in the basin of the river Krka.

Additional activities have to be mentioned, too: presentations, exhibitions, selling of literature and instruments, organisation meeting (10th ATH meeting), and the programme for accompanying persons. In the closure of the symposium, C. Leibundgut, the president of the International Committee on Tracers of the International Association of Hydrological Sciences, made a short summary of the expert part of the symposium, including the trends of the future activity of the ATH. The symposium was closed by R. Tavzes, the state secretary of the Ministry of Environment and Physical Planning.

For the moment it is too early to evaluate the success of the symposium; we have to wait for the remarks and published reports of the participants. Taking into account their number, the professional and organisation work done, the published material (1000 pages), the first responses of the participants and of the parent organisation - ATH - it is possible to say that the symposium succeeded as a professional event. Last but not least we must not forget the excellent technical assistance by the Meridiana agency and its specialist N. Zalar, as well as the Hotels Emona Convention Centre. The work and the money spent for the symposium must not be regretted. The question, however, how we will be able to make use of the new knowledge and the new perceptions is yet another problem.