



V sredo 28. junija se je zvrstilo 8 referatov. Dr. France ŠUŠTERŠIČ je podal nekaj detajlov o razvoju udornic. Karmen FIFER-BIZJAK je govorila o deformacijah okroglih jamskih presekov v odvisnosti od globine. Monica CELI je predstavila primere javljanja vrtač na področju Monte Grappa (Italija). Benedetta CASTEGLIONI je primerjala vrtače med dvema conama pri Vicenzi. Hrvat Damir LACKOVIČ je z diapozitivi predstavil raziskave Lukine jame na Velebitu, katere globina je -1.392 m. O rezultatih mineralne sestave jamskih sedimentov iz nekaterih vrtač Notranjske, ki jih je dobil skupaj z mag. Mihom MIŠIČEM, je poročal dr. France ŠUŠTERŠIČ. Damir LACKOVIČ je imel še eno predavanje, in sicer o stadijih hidrološke zgodovine nekaterih jam v dinarskem krasu. Kraške pojave, ki so se odkrili ob gradnji avtoceste Čebulovica-Dane, je prikazal dr. Tadej SLABE. Mag. Nadja ZUPAN-HAJNA in mag. Andrej MIHEVC sta predstavila klastične sedimente iz vrtač in jam na avtocesti pri Divači.

Popoldan smo si pod vodstvom mag. Andreja MIHEVCA ogledali klasični Kras. Najprej smo se ustavili v črnotiškem kamnolomu, nato pa smo si v bližini Divače ogledali udornice, kot Risnik, Radvanj, Bukovnik. Dan smo zaključili z ogledom kraških pojavov na trasi avtoceste Divača-Dane.

Tretji dan krasoslovne šole, to je v četrtek 29. junija, je dopoldan 6 avtorjev predstavilo svoje referate. Čeh dr. Jaroslav KADLEC je predstavil dva referata. Najprej je govoril o obliki fluvialnih prodnikov v površinskih in podzemeljskih tokovih moravskega krasa. Z drugim referatom pa je opisal razvoj ponornih dolin moravskega krasa na podlagi geofizikalnih meritev. Mag. Martin KNEZ je predstavil izsledke raziskav haracej v profilu Trnje. Prof. Jurij KUNAVER je za visokogorsko inačico vrtače predlagal izraz kotlič, kar pa bi bilo potrebno še podrobno raziskati. Prof. Ugo SAURO z Univerze v Padovi je predstavil nekatere primere vrtač v severni Italiji. Zadnji referat na 3. krasoslovni šoli je podal Poljak dr. Andrzej TYC, ki je govoril o nastanku udorov zaradi človekove dejavnosti v paleokraških področjih Silesie.

Popoldanska ekskurzija nas je pod vodstvom mag. Andreja MIHEVCA vodila na Hrušico in Trnovski gozd. Nad rovi Predjame smo si najprej ogledali vrtačo Golobovo dolino. Iz Bukovja smo pot nadaljevali čez Col do Zavrhovca, kjer smo si ogledali mesto barvanja za sledilni poskus, od koder vode odtekajo proti izviru Hublja, ki je oddaljen okrog 100 m. Ustavili smo se v veliki kraški depresiji Mali Lazni ter si ogledali vhod v -385 m globoko jamo Paradano. Kot zadnja je bila na vrsti Smrekova draga, ki je znana po inverzni vegetaciji.

Zadnji dan krasoslovne šole je bil namenjen celodnevni ekskurziji po južni Sloveniji, ki jo je pripravil dr. France ŠUŠTERŠIČ. Ogledali smo si kraško površje, visoke kraške planote, kraška polja, kraške ravnice na relaciji Snežnik-Kočevska reka-Novi Lazi-kanjon Kolpe-Bojanci.

Tudi letošnja krasoslovna šola je uspešno zaključena. Dobra mednarodna in domača udeležba, kljub opravičilu nekaterih znanstvenikov, ki se srečanja niso mogli udeležiti, zagotavlja dobro kvaliteto in zanimive teme, ki jih krasoslovna šola ponuja. Udeleženci letošnje šole so za drugo leto že predlagali nekaj zanimivih tem.

**Lukas Höttinger**

#### COMETT-EUCOR: MICROPAL 1995:

Advanced training course in foraminiferal ecology  
Marine Biological Station Piran (Slovenia),  
10-24. 9. 1995

Instructed by a staff of 5 (A. Arnaud, France; C. Caus, Spain; K. Drobne, Slovenia; L. Höttinger, Switzerland; U. Leppig, Germany) assisted by a number of invited additional speakers from the Marine Biological Station (A. Malej and B. Čermelj), from Kiel (R. Rottger) and from Vienna (M. Stachowitsch), 20 participants from Croatia, Germany, Italy, Mexico, Russia and Spain studied for two weeks the functional morphology and ecology of present and past benthic foraminiferans.

Foraminifera are a group of unicellular marine animals ranging from mm to dm size and producing calcareous shells with a complex morphology. The latter reveals their taxonomic identity and their mode of life. Easy to collect from recent seas, and to preserve, they have also produced a fossil record over long periods of Earth History since more than 300 million years. Their very numerous and dense populations have built up many limestones all over the world. Their abundance in the Adriatic Sea and in the geological formations on the shores of this Slovenian country was the reason to have MICROPAL 95 in Piran. This provided the opportunity to observe and collect recent foraminifera in the salt ponds of Sečovlje and visiting the Salt Museum, by dredging

off the Piran Station in the Adriatic and by visiting key outcrops of Eocene (45 Mio years old) formations showing the change of tropical shallow communities with geological time as a response to changing environmental conditions. The Adriatic marine environments were illustrated by wonderful underwater photographs taken with great experience and commented by M. Richter (Ljubljana).

In the station's lecture room, the participants studied and discussed the ecological meaning of architectural traits of foraminiferal shells, different types of marine ecosystems and the response of the foraminiferan populations and communities to the particularities of these systems. Each geological time period before the last biological revolution 24 Mio years ago represents a unique situation different from the present one, and develops its own historical identity. Such periods usually start with highly diverse assemblages of genera. Some of these genera will be successful evincing unsuccessful ones, and will develop a diversified series of species specializing soon in progressively diverging faunal provinces. This process represents a maturation of foraminiferal communities over many millions of years until the equilibrium between genetic and environmental change is broken, starting the process again for at least ten times during Earth History since the rise of foraminiferans as an important omnipresent element in marine ecology.

The marine sedimentary record of Earth History is conditioned by the rise and fall of sealevel in the world oceans. The rising sealevel is flooding large areas of the continents, the falling sealevel exposes continental mar-

gins to erosion when the sea retreats to deeper parts of the basins. The rhythm of sealevel rise and fall during geological time is recognized by particular features and the relative position of the layers of sedimentary rocks. The latter register also the depth of deposition by their content of fossils having lived in particular zones of water depth according to their ecological requirements. Thus, the fossils help to reconstruct the change of sealevel in geologic time while the geometry of sediment layers as recognized in seismic profiles may help to confirm the ecological significance of organisms extinct since millions of years. The use of the foraminifera in this so-called sequence stratigraphy was extensively discussed and exercised during the course by interpreting a seismic profile in terms of sequence stratigraphy and by interpreting a bore hole log with its contents of microfossils as used in petroleum industry.

As a final examination, the participants had to use what they had learned in the course by formulating in writing groupwise a research project according to the rules predominant in today's funding agencies. The critical discussion of the oral project presentations was complemented by a review of the organisation of Earth Science research and its funding in Slovenia presented by Acad. Prof. M. Drovenik, secretary of the Slovenian Academy of Arts and Sciences, Ljubljana, visiting the course and assisting to the presentation of projects.

We are grateful for the hospitality of the Marine Biological Station and the town of Piran and to the Slovenian people in difficult times supporting the full success of this international course.



**Participants and staff of COMETT-EUCOR: MICROPAL 1995 in front of the Marine Biological Station, Piran (Slovenia).**

**Udeleženci in organizatorji tečaja iz ekologije foraminifer COMMET-EUCOR: MICROPAL 1995 pred Morsko biološko postajo v Piranu.**