SUPPLEMENT 1

THE COMPLEX OF THE ČENKOV FOREST

Z. Svobodová, V. Řehořek

Within the complex of the Čenkov forest two State Nature Preserves were founded on hardened blown sands. Blown sands are a characteritic phenomenon of some parts of the Podunajská nížina /the Danube basin lowland/. The man contributed to their creation in the far past having removed the original forest on sand alluviums of bigger rivers thus enabling the wind to blow out the uncovered sands to typical dunes. These sand dunes are settled by a specific psamophytic vegetation but at present time only fragments continue to exist. Many dunes have been utilized for sand mining, others were planted with vine or foreign woody plants.

Psamophytic plants are acclimatized to extreme physical and chemical qualities of the substrate and they as well as their communities are marked by a characteristic physiognomy. Loose, non-coherent sands are easily permeable for water. Their upper layers are extremely dry. Roots of many psamophytic plants are therefore spread to the width to be able to catch rainfall from the greatest possible area and profit of the wetter layer under the surface. Dry sand is quickly and often even enormously overheated /to 60°C/. The warm surface enables to germinate early spring ephemerous species whose vegetation period is very short. Then you can find one-year terrophytes here creating loose clusters spread out freely on sand or creeping herbs printed to the sand surface. This way they harden the sand and enrich it with humus thus preparing conditions for perennial species, mostly clusters of grass or minute shrubs. Blown sands of the Podunajská nížina and Východoslovenská nížina /East Slovakia lowland/ are unlike acid sands of Záhorie and South Moravia alcalic, rich in lime that being manifested also in different vegetations.

ČENKOVSKÁ LESOSTEP PRESERVE

Čenkov forest-steppe preserve /49 ha, 1965/ was founded so as to protect the specific forest community Junipero-Populetum, unique in Czechoslovakia /known from the Hungarian National Park Kis-kunság/. It is a case of a rare soft flood-plain forest outside the reach of floods. Varied woody plant and herb compositions conditioned by the relief, ecological distinctness of sand dunes surface and their dampier depressions, and also anthropically /pasture in the past and rich shruby storey/.The following woody plants grow here: Populus alba, P. nigra /already rare in our country/, P. canescens, P. tremula, Quercus robus, Fraxinus excelsior, Betula pendula, Juniperus communis, Pinus sylvestris, Berberis vulgaris, Ligustrum vulgare, Crataegus monogyna; in dampier places of inter-dune depressions Salix repens ssp. rosmarinifolia.

As to the herbs, except those mentioned within the Čenkov steppe preserve also Pulsatilla nigricans, Onosma tuberculata, Scorzonera purpurea, Globularia aphyllanthes, Viola rupestris, Silene viscosa, S. otites, S. borysthenica, Se-

necio integrifolius,Campanula sibirica, Artemisia campestris, Jasione montana, Scabiosa canescens, S. triandra, Seseli hippomarathrum, Achillea setacea, Helianthemum nummularium, Onobrychis arenaria, Thymus angustifolius, Peucedanum oreoselinum, Inula salicina ssp. sabuletorum, Astragalus exscapus, Nepeta pannonica, Anchusa leptophylla, Botrychium lunaria, in dampier places Holoschoenus romanus, Carex flacca, Molinia arundinacea. Also dealpine species Hippocrepis comosa occurs here /washed by the Danube to lower locations/. Sandy substrate is favourable for mushrooms, too. Not only good eatable species grow here as for instance Boletus luridus, but also a rare species Helvella monachella was found here, propagated from the atlantic parts of Europe.

But unfortunatelly many introduced species as Robinia pseudacacia, Acer negundo, Prunus serotina, Cotinus coggygria, Gleditschia triacanthos, Celtis occidentalis, Ailanthus glandulosa, Sophora japonica, Amorpha fruticosa etc. were planted here thus disturbing the original character of the population. Especially Robinia pseudacacia stands accompanied by a number of nitrophilous species in the undergrowth do a lot of harm to the original vegetation.

On wet sands /after excavation/ near the village CHĽABA /east of Štúrovo/ rare species can be found such as: Cyperus flavescens, Eleocharis acicularis, Centaurium pulchellum, Blackstonia acuminata, Schoenoplectus supinus, Apera interrupta, Veronica peregrina, Eragrostis pilosa, Carex oederi.

ČENKOVSKÁ STEP PRESERVE

In Čenkov steppe preserve /2 ha, 1951; Festucetum vaginatae danubiale in 110 m a.s.l./ a varied palette of psamophytic and xerothermophile species, many of them belonging to protected or critically endangered species of our flora can be found. For instance: Festuca vaginata, Koeleria glauca, Stipa sabulosa, S. capillata, Chrysopogon gryllus, Carex liparocarpos, C. stenophylla, C. supina, Dianthus serotinus, Euphorbia seguierana, Fumana procumbens, Linum austriacum, Reseda phyteuma, Gypsophila paniculata, G. fastigiata, Potentilla arenaria, Helichrysum arenarium, Erysimum canum, E. diffusum, Alyssum montanum ssp. gmelinii, A. desertorum, Equisetum ramosissimum, Polygonum arenarium, Minuartia glomerata, M. setacea, M. viscosa, M. fastigiata, M. glaucina having here its "locus classicus" /in 1985 described as a new species within the group Minuartia verna/. Iris arenaria is an exceptionally rare species as well as Colchicum arenarium and Ephedra distachya occurring only here within the whole ČSSR at the border of their European distribution.

This exceptional locality becomes endangered by black locust and canadian poplar that overgrow it and also rooted up by wild boars. At the preserve periphery on denuded sands the following species grow: Cerastium semidacandrum, Holosteum umbellatum, Bromus tectorum, Anthemis ruthenica, Silene conica, Rumex tenuifolius, Lappula squarrosa, Tragopogon dubius, Tragus racemosus, Poa bulbosa, P. compressa, Cynodon dactylon, Oenothera spec. div., Kochia laniflora, Salsola kali, Tribulus terrestris, Corispermum nitidum, C. canescens.

SUPPLEMENT 2

Archaeological excavation at Mužla-Čenkov

Ivan Kuzma

The site is 18 km distant from Štúrovo, in the area of a farmstead at Čenkov, on the bank of the river Danube in the locations of Vilmakert and Orechový sad. The location of Vilmakert is ramparted from three sides, fourth side from the river Danube being protected by a steep riverbank , 3-5 m deep. At present, the total area of both locations is about 6 hectares. The site was known as early as the 1930s. The present excavation is carried out in advance of building a new flood dam, being a part of the construction of a Gabčikovo-Nagymaros hydroelectric power plant system. In the course of 1980-1988 an area of 11 000 m^2 was unearthed, 850 features and 70 graves being excavated.

The site was first occupied in the Neolithic by the settlement of late Linear Pottery culture and Želiezovce group of which all stages were present, mostly the middle and the late one. Due to extensive later disturbance it was possible so far to recover only parts of plans of neolithic long houses. Also other neolithic features have been discovered - exploitation and storage pits. Of the pottery, semiglobular vessels predominate, many pots being painted. Applied sculptures are very abundant as well.

The Baden culture /Aeneolithic/ is represented by the Boleráz group /Baden I/ and the Baden III and Baden IVa stages. So far, no dwelling of this period has been unearthed.

The end of the late Aeneolithic is represented by the Kosihy-Čaka group. As the features of this group are scattered in a large area, so far only some of them have been uncovered.

The period of the turn of the early Bronze Age is represented by several features, feature 66 with the so-called "Litzenkeramik" being most important, showing the links with other cultural centres of the Carpathian Basin.

The site was settled most densily in the Middle Ages. The settlement of this epoch dates from the 9th-10th centuries. Of more than 450 features excavated, almost a quarter are dwellings. They are square or rectangular in plan, partly sunken. The huts may be divided into several types on the basis of the character of heating bodies and construction techniques of overground walls. Other category of features are storage vessels with cylindric, cone-shaped, and dome-shaped bodies filled with various objects, animal and human skeletons, palaeozoological and palaeobotanical material. The narrower rectangular features containing dome-shaped ovens may be interpreted as "working hollows". The last group of the settlement features are exploitation pits.

In the area of the settlement there were also human skeletons. 19 skeletons uncovered in shallow grave-pits were scattered in the settlement area, 20 were clustered constituting a small burial-ground in the western portion of the excavated area. Human skeletons have been found also in the bottom parts of seven storage vessels.

The area of the excavated settlement was originally closed by a ditched rampart. Three ramparts were ascertained, the second one, earth-wood with a

frontal stone wall, being linked in with the ninth-tenth century settlement. In the neighbouring location Orechový sad trial trenches have recovered a continuation of the prehistoric settlement as well as a continuation of the 9th-10th century burial-ground.

Archaeobotanical report on the excavation at Mužla-Čenkov

Eva Hajnalová, Elena Lázniková

Field excavation on the archaeological site yielding materials of various prehistoric and historic epochs is undertaken in a close collaboration with specialists of various scientific disciplines. Archaeobotany welcomes the collaboration mainly for a possibility of obtaining plant remains dated to the 9th-10th centuries which are very rare in Slovakia so far. The goal of the archaeobotanical work carried out on the excavation from 1981-1988 is to ascertain which cultivated plants and weeds of cultivation occurred on the site or to obtain some data for the reconstruction of vegetation in a given period as well as to solve some agrotechnical and food problems of the early medieval community.

Archaeobotanical finds have been recovered mostly by flotation of soil infills of archaeological features. The plant remains survived in different conditions. We have found carbonised seeds and in some features, whose function has not been defined so far, also some non-carbonised leaves and fruits. The Danube-River water was used for flotation. The flotation was carried out on a riverbank using the method as follows: 10 litres of soil from one point of the feature, i.e. one find, were poured into a larger vessel and then poured through and stirred thoroughly. Floating remains were collected by means of a 0.5 mm sieve. The process was repeated several times according to the need. After pouring off the water about 1 litre of soil was taken, being floated through a system of 3 laboratory sieves, meshes being 3x3 mm, 1.6x1.6 mm, and 0.5x0.5 mm in size. All portions of finds /A - floating, B - rising, sunken, C, D, E - soil/ were dried and examined in laboratory separately.

In the course of 6 archaeological seasons 70 features containing about 300 points well-stratified and documented have been floated. The features dated to the 9th-10th centuries predominated. There were some neolithic and eneolithic features on the site as well.

Experience of the first seasons of our work on the excavation helped us later in selecting the most promising features and points. Our attention was devoted mostly to the storage pits which were half emptied or so. In the profile available we used flotation for finding the points best for sampling. One sample was about 1 litre in volume. Similarly also other features were half emptied by archaeologists or balks were left standing in some features /neolithic clay pits/. Other features examined by flotation on the Mužla-Čenkov site were ovens, areas in front of the stokeholes, huts and floors, areas alongside the walls, contents of complete vessels being found either in the settlement area or in the burial-ground.

In the laboratory more than 200,000 seeds of cultivated and wild plants

and about 3000 charcoals have been analysed by traditional archaeobotanical methods. Laboratory analysis has not been ready yet, so only a list of identified species is available. The 9th-10th centuries are represented by the assortment of cultivated plants as follows: Avena sativa, Camelina sativa, Cannabis sativa, Cucumis sativus, Faba vulgaris, Hordeum vulgare subsp. tetrastichon var. coeleste, Hordeum distichon, Hordeum distichon cf. subsp. nudum, Hordeum vulgare, Lens esculenta, Linum usitatissimum, Panicum miliaceum, Pisum sativum, Secale cereale, Triticum aestivum, Triticum aestivo-compactum, Vicia sativa, Vitis vinifera. The list of species and genera of wild plants contains more than 50 items. Trees and shrubs are represented by charcoals and seeds of Abies alba, Acer sp., Alnus glutinosa, Alnus spec., Berberis vulgaris, Betula spec., Euonymus spec., Frangula alnus, cf. Larix decidua, Ligustrum vulgare, Lonicera spec., Picea abies, Pinus spec., Pomoideae, Populus spec., Prunus spec., Prunus spinosa, Quercus spec., Salix spec., Sambucus spec., Ulmus spec., Viburnum spec. The present data show that wood flooded out by the Danube River was presumably used as well. Not all species ascertained could grow in the vicinity of the site. During the laboratory analyses numerous measurements of seeds have been made and photodocumentation of selected materials was produced.

The following assortment of cultivated species has been ascertained from the Neolithic: Triticum dicoccon, Triticum monococcum, Hordeum vulgare, Lens esculenta.

During the sorting of the material under a magnifying glass apart from the seeds our attention was devoted also to insect remains, molluscs, bones of small animals /birds, fish, and rodents/. Also these finds are being analysed by Slovak specialists.

The definite archaeobotanical evaluation of the Mužla-Čenkov finds has not been done yet. A partial evaluation has been done by two students of the University of Agriculture, Nitra in their theses. The theses are available on the site together with other documentation concerning the given site /documents 1-4/. We suppose that the final evaluation of archaeobotanical finds will be published as late as 1991 together with archaeological evaluation.

SUPPLEMENT 3

Archaeological excavation at Patince

Ivan Cheben

Prehistoric and medieval settlements were disturbed during the construction of a new holiday centre in the territory of Patince spa, location of Teplica. The settlements are situated in an eastern part of the village territory. The archaeological site proper is situated on the right bank of a canalised river Žitava, the settlement being 800 m long and 150 m wide. The southern part of the settlement is directly in the area of a holiday centre, the central and northern parts being in the area of intensive ploughing.

In 1983-1987 a rescue archaeological excavation was carried out ahead to earthworks in a part of the settlement area. During five seasons a southern portion of the settlement area was excavated, where in an area of 5800 m^2 features of the late Linear Pottery culture, Želiezovce group /early and middle stages/, Kosihy-Čaka group /only one feature/, and of the 11th-12th centuries have been recovered.

Of 511 settlement features a substantional part belongs to the late Linear Pottery culture and Želiezovce group /its early and middle stages/.

Relatively frequent /22 cases/ were features interpreted as bottom parts of ovens with survived parts of domes; the ovens were built at the end of settlement pits. Sometimes they were situated separately /6 cases/. The construction techniques and in some cases also the contents indicate their usage as corn-drying ovens.

Only one feature may be interpreted with certainty as corn pit /for storing cereals/, belonging to the latest phase of the Želiezovce group.

In total, 6 ground-plans of long houses have been recovered in the excavated area. One of them belongs to the late Linear Pottery culture, five to the Želiezovce group. There were working pits alongside the outer walls of each house.

The 11th-12th centuries are represented mostly by ground-plans of medieval settlement dwellings. The ground-plans are of three types. Most numerous are square dwellings, walls being from 3-4 m long, with a heating body /fireplace, oven, hearth/ at the corner. The second type is represented by feature 464, being rectangular in plan, with a dome oven placed outside the house. Feature 433 comes to the third type of the Patince medieval dwellings. The dwelling has a tongue-shaped entrance, a dome-shaped oven let into the wall of the dwelling, and a stone hearth at the south-east corner. There was also a pear-shaped corn pit adjacent to each excavated dwelling.

Archaeobotanical report on the excavation at Patince

Eva Hajnalová

In the course of three last seasons of archaeological excavation /1985-1987/ a systematic archaeobotanical field work was carried out. On the base of plant remains obtained in the excavated area we tried to ascertain the plants cultivated in the Neolithic and by choosing appropriate points for sampling to find out the purpose of some archaeological neolithic features. Being monocultural /the late phase of the Linear Pottery culture and the Želiezovce group/, the site was very suitable for archaeobotanical work. Flotation was employed in 38 archaeological features /clay pits, storage pits, hearth and their surroundings, around the saddle querns, postholes of long houses/ at 175 points. About 10 litres of soil were taken from each point, the water-supply system being used for flotation. Apart from the samples taken in archaeological features, control samples were taken in the so-called control blocks to find out the depth of the penetration of modern weed seeds into the profile. Some archaeological features being shallow /postholes max. 65 cm deep, pits max. 65 cm deep/, modern weed seeds might have occured in deeper layers of the profile as well. The archaeological features were different in the contents and the colour of the infill. Storage pits had uniform earth fillings. The column sampling was employed from the top of the pit down at 15 cm intervals in the profile remaining in the pit after it had been emptied to a half or three quarters of its infill. Clay pits contained well-distinguishable vari-coloured layers of soil. The samples used for flotation were taken at various points of control blocks in the parts where the largest number of plant remains could be supposed. Postholes. In two well-survived ground-plans of houses four triples of postholes in various portions of dwellings /outer walls, inner construction/ were emptied to the purpose of flotation. Ovens. Attention was devoted to the layers over the oven bottoms and around. Some pieces of a dome linen were taken to analysis in an attempt to recover some plant impressions in them. The archaeological site yielded a large amount of daub /125 features/.

A field documentation has been performed reporting colour and finds of organic and inorganic admixtures present in the soil floated as well as various archaeobotanical relationships. A list of modern vegetation in the settlement area as well as in its close and more distant vicinity has been produced, too.

Laboratory examinations have not been started yet. A complex archaeobotanical analysis is to be performed within the archaeological evaluation of the site. Publishing presumably in 1995.

SUPPLEMENT 4

The Roman military camp at Iža

Ján Rajtár

The southern portion of modern western Slovakia was adjoining to the Roman Empire in Roman times /1st-4th centuries A.D./, the Danube being a strategic and military frontier of the Roman Empire. The territory to the south of the Danube belonged to the Roman province Pannonia, the territories to the north of the Danube to the so-called Free Germania, where the Quadi were settled.

On the turn of the 1st century opposite the confluence of the rivers Danube and Vag the Romans built a legionary fort called Brigetio, one of the later centres of Upper Pannonia, as a part of a system of frontier forts /the so-called Limes Romanus/. Later, in the 170s, in the period of the so-called German wars, during the reign of the Emperor Marcus Aurelius, the Romans built a fort opposite to Brigetio, in its bridge-head on the left bank of the Danube /the modern name of this site is Leányvár, located in the territory of a village called Iža/. It was a temporary fort, the so-called wood-earth camp, defended by two ditches and an earth rampart with a wooden palisade. Inside there were buildings built of dried bricks. This fort was one of the most significant bases employed for offensive purposes of the Roman army in the territory of modern Slovakia during the German wars. However, the fort ceased to exist some years later, in the course of the German wars during one of the Germans' attacks.

After the end of the German wars /late 2nd century/, the Romans have built a permanent stone camp for their auxiliaries on the same place. Being a strategic bridge-head of Brigetio, the camp had a dual function - to defend its mother camp and the adjacent part of the Roman frontiers as well as to control the Roman power in this territory and to ensure Roman interests in the forefield.

The camp was square in plan, measuring 172x172 m, enclosed by a stone wall 4 to 5 m high, battlemented. The wall had 20 turrets. The gateways placed in the middle of the sides of the square were flanged by towers. There were towers, too, at the rounded corners of the walls and between the corners and gates. Inside the camp was earth piled up against the wall, outside the camp were two, later even five, rings of ditches. The plan of the camp was standardised. Inside the fort were barracks, the headquarters building, stables, granaries, a bath, wells, cisterns, and corn-drying ovens.

The fort survived in this form up to the mid-third century when it was badly damaged during the Germans' attacks. The most remarkable evidence of rebuilding the fortification system dates from the fourth century. At that time, from the outside bastions were erected at the corners and gateways. The Roman garrison occupied this fort as late as the death of the Emperor Valentinianus I, who died in 375 at Brigetio. A short time later the fort has been plundered. In the following decades groups of mixed Suebian and Gotho-Alano-Hunian population occupied the area of this camp. After their departure in about the

mid-five century, the area was unsettled.

The Roman ruins at Laányvár were reported upon for the first time by the English travellers Richard Pockock and Jeremiah Milles as early as the 1830s. The present knowledge of this archaeological site is based on several long-run archaeological excavations. The first professional excavation was carried out by János Tóth-Kurutz, born at Iža, in 1906-1909 and 1912-1913. After the excavation of Jaroslav Böhm in 1932, the first phase of a re-examination of the site was undertaken by Bedřich Svoboda and Mária Schmiedlová in 1955-1957. Since 1978 the Archaeological Institute of the Slovak Academy of Sciences has been carrying out excavations at this site conducted by Ján Rajtár and Klára Kuzmová in advance of the construction of the Gabčikovo-Nagymaros hydroelectric power plant system.

Archaeobotanical report on the excavation at Iža-Leányvár

Eva Hajnalová

Archaeobotanical work has been done on the site occasionally in the course of four archaeological seasons /1981-1983, 1987/. The goal of this work on the site was to obtain an idea of the assortment of cultivated, wild, and imported plants in the Roman times in particular. The fieldwork as well as the features selected for study were limited by the fact that 30-40 years ago many features which might contain large numbers of plant species /a kitchen, stores, stables/ were excavated by archaeologists and so entirely destroyed for archaeobotanical work.

Method. The archaeobotanical material from features has been obtained either by excavators during excavation /charcoals, plant-impressed bricks, metal-petrified wooden parts of objects/ or by flotation of soil fills of archaeological features yielding more valuable palaeobotanical evidence. Water from a well with a pump was employed to float palaeobotanical material of three Roman wells, two ditches, surrounding of two bread ovens. A part of the finds recovered was published in a catalogue /Hajnalová 1989/. From later periods two small undisturbed ovens constituting a part of an oven battery dug in the slope of a dry ditch, three corn pits, two huts, and a ditch filled with the rubbish of the Roman camp have been examined. The palaeobotanical material cannot be dated exactly due to incomplete archaeological documentation.

In total, the soil of 99 points of 19 features has been floated. From 2-20 litres of soil were employed for flotation from each point. On the site also other palaeobotanical finds have been recovered by archaeologists.

Excavation documentation gives notes of the colour of the floated soil, its composition being evaluated visually, as well as other organic and inorganic finds.

Laboratory work. Archaeobotanical analyses are being made. Analyses of 1981-83 have been completed and filed in the Archives of the Archaeological Institute of the Slovak Academy of Sciences, Nitra. More than 60 complexes of finds have been evaluated.

Final evaluation. Publication depends on the completion of the analyses as well as the end of archaeological excavation resulting in a definite dating of the features.

Two features have so far been dated definitely - a well and a bread oven. We are enclosing an archaeobotanical report on them.

Well 1 /the second half of the 4th century/

The filling of the well timbered of Abies in its bottom part. Floated layers: from the underground water level of the well up to the height of 100 cm. Carbonised seeds: Secale cereale, Triticum aestivum, cf. Triticum dicoccon, Hordeum vulgare. Carbonised as well as non-carbonised seeds: Prunus domestica, Cerasus spec., Vitis vinifera, Malus/Pyrus, Lamium purpureum, Chenopodium cf. glaucum, Ch. spec., Stachys annua, Chelidonium majus, Solanum nigrum, cf. Daucaceae, Asperula/Galium, cf.Cyperaceae, cf. Sonchus oleraceus.

Bread oven 1 /3rd-4th centuries/

Carbonised grain was presumably a part of a supply. The way of how the grain was stored has not been recovered. The seeds were scattered in the soil in an area of about 30 m^2 around the oven. The species are as follows: Triticum aestivum, T. aestivo-compactum, T. dicoccon, Hordeum vulgare, Secale cereale, Panicum miliaceum, Setaria italica, Sambucus ebulus, Lithospermum arvense, Chenopodium album, Ch. hybridum. Ch. polyspermum, Ch. spec., Stachys annua, Carex spec., Galium cf. sylvaticum, Viciaceae, Brassicaceae, Polygonum spec., Bromus spec.

PALAEOETHNOBOTANY AND ARCHAEOLOGY

A GUIDE TO THE EXCURSION

Wednesday, 21 June 1989

Z. Svobodová, V. Řehořek

Southwestern Slovakia, where the seat of the Archaeological Institute in Nitra and three archaeological localities along the Danube are situated and which will be visited during the excursion, has also rich and interesting flora. It lies on the border between the Carpathian and Pannonian floral regions. A number of Pontic-Pannonian and submediterranean species reach their northern or northwestern border of their natural area here and many of them occur only in this single place of the whole Czechoslovakia /e.g. Convolvulus cantabrica, Micropus erectus, Galium tenuissimum, Sternbergia colchiciflora, Ephedra distachya, Colchicum arenarium, Vitis sylvestris, Limonium gmelinii, Lathyrus venetus, atc./.

The species richness is caused not only by the geographical situation but also by the diversity of geological substrates and warm and dry climate. Mean annual temperature is 9.7°C /Nitra/, 10.4°C /Štúrovo/. Mean annual rainfall ranges from 550-580 mm.

In spite of the fact it is a case of a territory which was explored by a man already in vanished past, even today a number of natural water, swamp, grass-field ecotopes, flood-plain forest remainders, salt lands, sandy soils and xerothermic grass growths gradually to forest-steppes and foliaceous forests have been preserved. A great portion of the district area was transferred to the so-called cultural steppe already in the past. On fertile loess soils of deforested hills and river alluviums an intensive large-scale agricultural production developed being aimed except wheat, barley, sugar-beat, and rape also at thermophile plants as maize, tobacco, tomatoes, pepper, sunflowers, melons. Lucerne, maize, and sunflowers for ensilage as well as various mixed corns are being cultivated as food-stuffs. Hillsides were changed into vineyards and villages are surrounded by foil-houses with forced vegetables.

Synanthropic flora is also very rich, many thermophile weed species of apophytic character grow here, but also a number of adventitious foreign species finds favourable conditions and distribute agresively as for instance Iva xanthiifolia, Ambrosia artemisiifolia, Cannabis ruderalis and others.

Out of the total number of 120 species protected by a law in Slovakia, more than 1/3 of them occur here, and also more than 1/3 of endangered species are included in the red list of endangered species in Slovakia. Many species growing here were classified among the species of the Red Book of Czechoslovak flora, which is being prepared.

Natural flora of Southwestern Slovakia has its protection secured within

many protected areas. Those situated near our route are briefly noticed in the following text of our travelogue. Some of them will be visited.

The route is leading across the Podunajská nížina /the Danube basin lowland/ which in its northern part turns to not very high undulating hills with river beds running across.

VRÁBLE

The town of Vráble is situated on the alluvium of the river Žitava, which has been canalized in this part of its flow. Beautiful alluvial grass-fields and swamp communities used to be here some 30 years ago, a small remainder being preserved in the protected area called "Žitavský luh"/No. 1, see the encircled figures on the map/, about 10 km southward of Vráble. They are Alopecurus pratensis, Bromus racemosus, Oenanthe silaifolia, O. fistulosa, Allium angulosum, Viola pumila, Lythrum virgatum, Serratula tinctoria, Scutellaria hastifolia, Veronica longifolia, Thalictrum lucidum, Gratiola officinalis, Carex praecox, etc. Swamp communities with Carex gracilis, C. riparia, C. disticha, C. elata, C. paniculata, Catabrosa aquatica etc. It is also an important biotope for water fowl migration roads.

We turn to the east at Vráble leaving the Žitava river basin behind and crossing the northern part of the Pohronská pahorkatina /hills along the river Hron/ at the border with the southern slopes of Štiavnické vrchy /hills named after the town of Banská Štiavnica/ a small group of which was cut off by the river Hron. Their most marked peaks being Dobrica /andesite tuffs/ and Veľká Vápenná /altitude 350 m a.s.l., limestone/. Dobrica is known by its beautiful oak-cer groves rich in mushrooms. Quercus pubescens and Fraxinus ornus grow here, too, the occurence of the latter being considered original. Between these two hills the village Mochovce used to exist - today a building site of an atomic power plant. The towns of Nitra, Levice, Zlaté Moravce will be supplied with the so-called waste heat. A study on using this energy for heating big green-house complexes in the river Hron valley as far as the town Želiezovce has been worked up resulting in a changed structure of the agricultural production in this area. The share of forced vegetables will be considerably increased.

Between the villages Čifáre and Veľký Ďur to the right of the road there is a known state nature preserve "Patanská cerina", protected as a remainder of an oak-grove /Quercus cerris/ with vast nesting-places /Pernis apivorus and others/.

KÁLNA nad Hronom

Kálna nad Hronom /altitude 160 m a.s.l./. Similarly as in other places of our route, remainders of old settlement going as back as to the eneolithic, early Bronze Age, then Hallstatt, La Tène, and Romano-Barbarian settlements were found here.

We shall turn southward along the river Hron terrace, which is one of the most beautiful Slovak rivers. In the length from the village Šarovce to the village Bíňa, on the left river bank we can see the remainders of hard food-plain forests, preserved, in the first place, in three State Nature Preserves /No. 2 in map/: "Hlohyňa","Vozokanský luh", and "Dubina pri Bíni": Fraxinus excelsior, Ulmus laevis, U. minor, Quercus robu , Rhamnus cathartica, Fran-

gula alnus, Padus racemosa, Crataegus laevigata, Viburnum opulus, Vitis vulpina, Clematis vitalba. In dampier places Alnus glutinosa; in lower degree Salix alba, Populus alba, P. nigra, P. canescens; in the undergrowth Circaea lutetiana, Viola elatior, Carex remota, Agropyron caninum, Ficaria verna ssp. bulbifera, Galanthus nivalis, Arum alpinum, Maianthemum bifolium, Convallaria majalis, Orchis purpurea, Scilla bifolia, Asarum europaeum, Polygonatum latifolium, P. multiflorum, Corydalis cava, Pulmonaria officinalis, Gagea lutea and others are growing.

ŠAROVCE

The earliest settlement here date back to the Neolithic /linear culture, the Želiezovce group and Lengyel culture settlement/. The Eneolithic with Baden pottery, the Maďarovce culture settlement from the Early Bronze Age, La Téne settlement with pottery kilns , Germanic settlement from the 2nd-3rd centuries. Inhumation burials from the Migration period, Slavonic settlement from the 9th-10th centuries, the Belobrdo culture burial place from the 10th century, an abondoned medieval settlement.

ŽELIEZOVCE

It is an agricultural town. A baroque masion house from 1720 with a park founded by a count Esterházy in 1875 can be seen there. Among old specimens Taxodium distichum, Platanus acerifolia, Celtis occidentalis, Liriodendron tulipifera, Gymnocladus dioicus, Quercus robur are still standing there. At the park entrance there is a small house where Franz Schubert lived and worked in summer in 1818 and 1821 as a music teacher of count Esterházy's daughters. In the gothic church from the 14th century a Roman sarcophagus was used for the altar.

POHRONSKÝ RUSKOV

Pohronský Ruskov - settlement beginning with the Neolithic. There is the oldest active sugar factory in Slovakia founded in 1893.

ČATA

Continuous settlement from the Neolithic to the Early Bronze Age, Hallstatt and La Tène; Roman-Barbarian settlement and Slavonic settlement of the post-Great Moravian period.

BÍŇA

Settled in the Neolithic /Linear Pottery culture, the Želiezovce group, the Lengyel culture/, the Eneolithic with Baden culture, the Maďarovce culture from the Early Bronze Age, Hallstatt settlement and burial finds, La Tène settlement and burial place, Roman-Barbarian settlement from the 2nd-4th centuries, Slavonic fortified settlement and burial place from the 9th-10th centuries, and mighty system of walls and ditches from the 10th-14th centuries. A part of heaped mounds can be seen at the drive to the village, they are digged through in the p ce where they cross the railway. About 1217 the Amadeus family founded a Premonstratensian monastery and a provost's residence here. Another significant object deserving our attention is a romanesque rotunda from the beginning of the 12th century, renewed in a baroque style in 1755, reconstructed in 1954 and again in 1986. Remarkable paintings from the beginning of the 12th century. Next to it a church - romanesque basilica from the beginning of the 13th century - is situated, with rich ornamental and figure decoration of the portal

and column capitals. The church was strongly damaged at the end of the Second World War, the present state reflects the reconstruction.

At the other end of the village Bíňa, to the left of the route the hills between the river Hron and Ipeľ stretch away and precious localities of thermophile flora can be found there, for instance Crepis pannonica, Teucrium montanum, Prunus fruticosa, Campanula macrostachya, Iris variegata, Orchis militaris, O. ustulata, O. tridentata, Inula germanica, Bupleurum rotundifolium, Salvia aethiopsis, Alcea biennis, Astragalus austriacus, Verbascum speciosum, Ornithogalum pyramidale etc.

KAMENÍN

Southward of the village under the river Hron terrace on salty soils, there is another Nature Preserve "Kameninske slanisko" /No. 3 on the map/. It is a unique sample of hallophylous vegetation growing in stripes in dependence on salt concentration and humidity degree. 11 communities have been distinguished here representing the most northern zone of their distribution. Areas without any vegetation with white salty flowers in the form of crusts are framed with growths of Camphorosma annua often together with Matricaria chamomilla ssp. bayeri, followed by the zone with Puccinellia limosa, Plantago maritima, Artemisia monogyna, Aster tripolium, less often Trifolium angulatum. Limonium gmelinii is the most precious species here, this being its only locality all over Czechoslovakia.

In drier places there are salty steppes with Festuca pseudovina, Bupleurum tenuissimum, Taraxacum bessarabicum, Podospermum laciniatum, Trifolium fragiferum ssp. bonannii, , Ranunculus pedatus, Cerastium dubium, Senecio erucifolius and others. Juncus gerardii, Scorzonera parviflora, Taraxacum palustre, Triglochin maritimum, Carex divisa, C. distans, C. hordeistichos, Schoenoplectus tabernaemontani, Bolboschoenus maritimus grow in dampier places, mosaic-like. P oliurus pannonicus, Plantago tenuiflora, Heleochloa schoenoides, Lepidium perfoliatum etc. prefer injured places. Toward the river there are rich growths of Iris spuria and Aster punctatus, unique species in the ČSSR. South of the "Kameninske slanisko" preserve, between the road and the railway another locality of hallophilous vegetation called "Čistírny" is situated. It will be proclaimed a preserve in a short time.

Between the villages Kamenín and Kamenný most we cross Parižsky kanál /regulated brook/ upon which near the village Gbelce a preserve "Gbelské močiare" /swamps/ is located. It was established so as to protect water-fowl nesting.

To the right of the village Kamenný most we can see the slopes of Belánske kopce /tertiary sandstones, mesozoic limestones, loess/, in their southern part there are two reservations "Vŕšok I" and "Vŕšok II" /No. 4 on the map/. The vegetation between vineyards on soils which are not under cultivation is also precious e.g. Antherium ramosum, Seseli hippomarathrum, S. pallasii, Chamaecytisus ratisbonensis, Scorzonera austriaca, S. hispanica, Campanula sibirica, C. bononiensis, C. glomerata ssp. farinosa, Agropyron pectinatum, Achillea ochroleuca, A. trichophorum, Aegilops cylindrica, Chrysopogon gryllus, Alyssum desertorum, Festuca valesiaca, F. rupicola, Linum austriacum, L. flavum, L. hirsutum, L. trigynum, L. perenne, Iris aphylla, I. graminea, I. pumila, Aster amelloides, A. linosyris, Isatis campestris, Hesperis tristis, Ju-

rinea mollis, Inula ensifolia, Phlomis tuberosa, Ophrys sphecodes, Silene longiflora, Cephalaria transsylvania, Taraxacum serotinum, Teucrium botrys, Thesium arvense, Artemisia pontica, Orobanche caryophyllea, O. alba, O. arenaria, O. alsatica, O. gracilis.

Conspicuous are the species of Amygdalus nana, continuous stripes of which as well as huge flowering clusters of Crambe tataria are well visible already from the distance. Sternbergia colchiciflora discovered for our territory only 10 years ago is the most precious species here.

ŠTÚROVO

Štúrovo /embankment 104 m a.s.l./ originated in the place of an older prehistoric settlement /continuous settlement from the Neolithic to Slavonic--Avarian burial place in the 7th-8th centuries and to Slavonic settlement in the 10th century/ and fishers' settlement from the 12th-13th centuries as well as the bolt fortification of the Danube bridge to Estergom and which was built in a new place by Turks and called Džigerdelen Parkany /in the translation "a fort penetrating the liver of the enemy"/, and thus giving the older name to the town - Párkan /Hungarian Párkány/: a ferry across the Danube was built here in 1762, a pontoon bridge in 1842, and railway one in 1895. At present the town develops its industry, South Slovakia Cellulose Factories and Paper Mills and others. There is a great thermal swimming-pool in the town.

The bridge was destroyed by the fascist army in retreat in 1944. The part which has been preserved offers a view of Estergom with a majestic basilica from the 19th century and of Visegrad hills in the distance. The town is rich in sacral architectural monuments reminding us the former archibishopric. A great portion of the present day Slovakia used to belong to it in the past.

Eastward between the confluences of the rivers Hron and Ipeľ with Danube a mountain range Kováčovské kopce /No. 5 on the map/ is lying /Burda 400 m a.s.l./ built up of tertiary eruptive rock /andesites and their tuffs/, at the foot loess. From the phytographic point of view this mountain range within the Pannonian flora region belongs to the area of Matra flora /Matricum/.

An immense richness of precious and endangered thermophile species, most of them being protected and endangered species of our flora at the same time, is concentrated in this area. Many rare insect species have been living here, too. Of the vertebrate fauna Ablepharus pannonicus - resembling a small lizzard - is worth mentioning as the only representative of the Scincidae tribe in our country. Two Nature Preserves have been founded here /the third protected area is in the state of preparation: Adonis vernalis, Carthamus lanatus and others/.

The Nature Preserve "Kováčovské kopce - north" /200 ha, 1966/ covers the northeastern part above the valley of the river Ipeľ /Querco-Carpinetum caricetosum pilosae/, where Fagus silvatica reaches its heigth minimum of its occurence /120 m a.s.l./ is the most southern position within the ČSSR.

The Nature Preserve "Kováčovské kopce - south" /360 ha, 1966/ covers south, toward the Danube inclining steep rocky hillsides with bizzare rocky formations, with promontories and adjacent afforestated table lands /plateaus/ above them. Plant communities with many Pannonian and submediterranean species can be found on extreme xerothermic stands, many of them having there the only locality in the ČSSR /e.g. Convolvulus cantabricus, Micropus erectus, Galium tenuissimum,

Medicago rigidula, Erodium ciconium, Stipa crassiculmis, Herniaria incana, Valerianella coronata, Ceratocephala testiculata, Althaea hirsuta, A. taurinensis, all of them at their northern border of distribution.

Of some more significant woody species Quercus pubescens, Fraxinus ornus, Acer tataricum, Euonymus verrucosa, Cornus mas, Staphylea pinnata, Colutea arborescens, Prunus mahaleb can be met here.

Of herbs Asplenium adianthum-nigrum, Sempervivum marmoreum, Sedum krajinae, Cleistogenes serotina, Stipa joannis, S. pulcherrima, S. stenophylla, S. dasyphylla, Festuca valesiaca, F. pseudodalmatica, Ranunculus illyricus, Minuartia glomerata, Crupina vulgaris, Crepis pulchra, Trigonella monspeliaca, Geranium rotundifolium, Bupleurum praealtum, Androsace maxima, Pulsatilla grandis, Vinca herbacea, Potentilla patula, Orlaya grandiflora, Turgenia latifolia, Achillea crithmifolia, Euphorbia glareosa, Centaurea sadlerana, Arenaria procera, Echium russicum, Medicago prostrata, Muscari botryoides, borbasii, Vicia sparsiflora, Althaea cannabina, Lathyrus pannonicus ssp. collinus, Dictamnus albus, Limodorum abortivum, Lilium martagon, Silene viridiflora, Potentilla micrantha, Cephalanthera alba, C. rubra, C. ensifolia, Doronicum hungaricum and many other species live in these places.

At the foot of Kováčovské kopce where the river Hron empties into the Danube extended alluvial grass-fields were annually overflown some twenty years ago. They were characterized by a mass occurance of Fritillaria meleagris, Leucojum aestivum, then Plantago altissima, Galium rubioides and other species of the Alopecuretum pratensis community. In the neighbourhood also Nymphoides peltata. When the river Hron was regulated, grass-fields were changed into cultivated soil.

We continue our way through the locality MUŽLA to the complex of the ČENKOV forest. Not in the far past the Danube was framed with soft flood-plain forests /Saliceto-Populetum/, partially anthropically changed /Salix alba, S.fragilis, S. cinerea, S. triandra, Populus alba, P. nigra, Rubus caesius, Urtica dioica, Polygonum mite, Myosoton aquaticum, Senecio fluviatilis, Epipactis helleborine, Solanum dulcamara, of foreign species Solidago gigantea, S. canadensis, Impatiens glandulifera. We are sorry to say but these forests are being sawn down as a result of building the water electric power plant Gabčikovo-Nagymaros. By this way the only population of Vitis sylvestris in our country is being endangered. It occurs together with a precious species Hierochloe repens in the locality opposite the Čenkov island.

A visit to locality No. 6 - Čenkov forest-steppe preserve, and No. 8 - Čenkov steppe preserve - see details in Supplement 1.

A visit to locality No. 7 - archaeological excavations in Čenkov - see details in Supplement 2.

Our route leads us along the Danube to the west via the villages KRAVANY, MOČA, RADVAŇ to PATINCE where we shall stop for our meal on the termal swimming-pool campus and have a rest there, then we'll find some time to look over the documentation of an archaeological excavation, now completed. Locality No. 9 - see details in Supplement 3.

Between the villages PATINCE and IŽA, to the right of the road there is

the reservation "Bokroš" /salt-soil; Achillea aspleniifolia, Malcolmia africana and others/. A little to the north moving sands preserve "Marcelová" lies, a locality where originally northamarican but now a home species Cycholoma atriplicifolia grows. This "steppe runner" creates big, red, globe-like clusters in autumn.

A visit to locality No. 10 - archaeological excavations in IŽA - see details in Supplement 4.

IŽA. After on-the-spot inspection of the archaeological excavations we go on along the Danube to the town of Komárno.

KOMÁRNO

The earliest settlement here can be traced as far back as the Neolithic. Later, the Romans built military camps here. Burial finds can confirm Slavonic settlement. On the fundations of the original castle /13th century/ bearing the same name as the town a fort was built up to protect the town agaist the Turks. It played an important role in the protection of the whole Žitný ostrov /Žitný island/. A new fort of star-like shape was built up in the 17th century. Remainders of the bridge across the moat and of the town fortification are preserved till our days.

The town possesses a museum /Podunajské múzeum/ with a valuable collection of Roman memorable objects and precious icons. In front of the museum there is the statue of a well-known Hungarian writer Mór Jókai who was born in Komárno in 1821. The town is also the birthplace of the composer Franz Lehár. At present Komárno is known by its ship-building yards.

Leaving Komárno we continue our way further to the north. Near the railway station CHOTÍN thereis a "rybárska čárda" /čárda - a Hungarian name to a road-house where fish meals are being served/. At the western border of the village Chotín a well known Nature Preserve "Chotínske piesky" is situated /Achillea ochroleuca/.

Several km to the west of the route near the village MARTOVCE a protected area called "Alúvium Žitavy" /Alluvium of the river Žitava/ lies - water and swamp communities in the confluence of the river Žitava and Nitra /Nuphar lutea, Wolffia arrhiza, Stratiotes aloides, Senecio paludosus, Euphorbia lucida, Cirsium brachycephalum, Epipactis muelleri/. There is a museum of peasant architecture and furniture in the village.

HURBANOVO

In 1870 an astrophysical and meteorological observatory was built here by Mikuláš Konkoly-Thege as the first one in the territory of the former Hungarian lands. Today the town is known by its modern brewery /Golden pheasant beer/. At the western border of the town you can find "Revayovská pusta", a protected area rich in fungi species from the Gasteromycetes group growing in false acacia forests on sands.

Not far from the village BAJČ we shall turn to the village DVORY nad Žitavou and will proceed along the river Žitava through the villages of BEŠEŇOV, DOLNÝ OHAJ, HÚL in the direction of the town VRÁBLE. Leaving the village MAŇA behind we shall pass by a romantic lovely house with an old mill /Gedra/.

Next to it at the beginning of our itinerary mentioned preserve "Žitavský luh" is located.

More to the west between the rivers Žitava and Nitra two bigger complexes of precious flood-plain forest and two protected areas have been preserved: dead arms "Čierna voda" and "Torozlin" with water and swamp vagetation /e.g. Nymphaea alba/ and fauna /Emys orbicularis/.