HUNGARIAN ACADEMY OF SCIENCES

ANNOTATED REFERENCES

TO THE BŐS (GABČIKOVO)-NAGYMAROS DANUBE BARRAGE SYSTEM PROJECT

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Contents

PREFACE

The Bős (Gabcikovo)-Nagymaros River Barrage System has an impact on the environment concerning a more than 200 kilometers long reach of the Danube and the adjacent lowland areas of different latitudes. These lowland areas are of significant natural and economic value, on which the Danube and its water movement has a decisive role. Thus, it is understandable that the demand for measuring and analysing the changes occurring in the impacted area has been brought up more and more often during the time of planning and even more in the course of the construction of the river barrage system. Studies, reports and scientific publications of diverse range review and evaluate the natural, economic and social changes in the lowland landscape of the highly valuable Kisalföld region affected by the barrage system both in Hungary and in Slovakia according to the intention of the parties passing the orders.

Upon the request of the Parliament of the Hungarian Republic and the Hungarian Government, respectively, the Hungarian Academy of Sciences made an overview of the current status of ecological studies on the Szigetköz region, which is especially endangered by the environmental impacts of the river barrage system. (The Szigetköz region is a highly valuable area located between the main channel and the so called Moson Reach, partly on a floodplain with a dense network of side arms.) The Hungarian Academy of Sciences summarized its investigation in a study of approximately 150 pages *(Szigetköz - Környezettudományi kutatások. Környezeti állapot, ökológiai követelmények. MTA Bp. 1993. Szerk.: Láng, I., Banczerowski, J.-né., Berczik, Á.)* and distributed it among the decisionmakers, institutions, and the relevant experts. As a follow up to that work a demand arose for the elaboration of an annotated bibliography for the complete area affected by the river barrage system in Hungary, the Rajka-Budapest reach of the Danube, the Szigetköz region and the riparian areas as far as direct impact can be assumed. Studies dealing with the effects of the river barrage system exclusively in Slovakia are usually not included in the collection.

The Bibliography has already been published in Hungarian. *(Annotált bibliográfia a Bős (Gabcikovo)-Nagymarosi Vízlépcsőrendszer hatásterületét érintő fontosabb környezeti kutatásokról. MTA Bp. 1994. Szerk.: Láng, I., Banczerowski, J.-né, Berczik, Á.)* This English version includes the translation of the complete Hungarian bibliography and some additional items.

The present bibliography contains the summaries of those selected representative publications which have been considered important by the researchers participating in the analyses. The primary aim of the annotation is the introduction of research results, sometimes they reflect contradictory opinions and views. The bibliography can not include all publications, however, it gives an adequate overview on the relevant studies.

Hungary and Slovakia appealed to the International Court of Justice in order to settle the debated problems regarding the establishment of the barrage system. Several background studies have been and are being prepared for the Hungarian and foreign experts participating in the legal action. A lot of these studies scientifically analyses the whole scope of problems and summarizes published and non-published papers.
Bibliographical data have been arranged in major groups of themes to help the

work of decisionmakers and experts who would like to get additional, more detailed information on certain subjects. The content review provides a digest at special topics. As a consequence of thematical grouping it was unavoidable that references to certain studies, reports or books appear in more than one section, since they may contain data on different disciplines. The author index at the end of the volume and the initials of the reporting experts in the text facilitate the orientation in the book.

Budapest, September 1994.

The editors

GEOGRAPHY

1. Asztalos, I. - Somogyi, S.

Effects of the construction of the Rhine-Main-Danube and Danube-Tisza Canals on regional development. (in Hungarian)
Területfejlesztési Közlemények, 3: 1-135.
1977.

The study is the summary of a research project in the above topic. It was conducted in the Geographical Research Institute of the Hungarian Academy of Sciences commissioned by the Ministry of Housing and Public Construction between 1972 and 1974. It deals with channel improvement and regulation, the necessity and consequences of improved river navigation concerning especially the Upper-Danube. It describes their influences exerted on river ecology, on the groundwater, vegetation and soils of the riverside, on the economic activity, agricultural production, transportation of the region and on the life of the affected population. It outlines the tasks of environmental protection in the region as well.

S.

2. Ábrahám, M. - Várday, N.

Water quality problems of the Rajka-Esztergom reach of the Danube. (in Hungarian)
Hidrológiai Közlöny, 2: 60-63.
1977.

Without the information concerning the pollution from the left bank of the Danube, a hydrochemical longitudinal section is difficult to prepare. The exact data of pollution have to be known to build the planned sewage-filtering farms. The self-purification capacity is 4-600 tons oxygen demand per day. Water quality is influenced by the pollutants from the right bank catchment area to a lesser extent. In the borderland section a slow quality degradation can be expected to continue.

S.

3. Balogh, J. - Lóczy, D.

Effect of the changing groundwater level on the geomorphological facies of the Szigetköz, after the construction of the Dunakiliti Reservoir. (in Hungarian)
Földrajzi Értesítő, 41: 115-125.
1992.

The authors combined the geomorphological map (by M.Pécsi) and the groundwater-depression prognostic map and thus detected the expected areal differences of the geomorphological facies (flood plains, shoals, shallows, filled channels and point bars). According to their calculations the change of the groundwater level is to affect more than 80 % of the territory because capillary water cannot rise to the surface from the underlying gravel layer.

In 75 % of the area crop yields will depend on the medium water of the Danube during growth season.

S.

4. Barna, A. - Danicska, L. - Nagy, L.

Effect of the Gabcikovo-Nagymaros Barrage System on the European inland waterways. (in Hungarian)
Vízügyi Közlemények, 2: 273-288.
1974.

The efficiency of navigation is shown in one horse power transporting eight times more cargo than on rail and thirty times more than on road; and less labour is requested. The transit goods traffic on the Upper-Danube was 4.5 million tons between 1968 and 1971. 12 % of that traffic was handled in Hungary. The present freight transmitting capacity of the river is about 7 million tons to be reached by the end of the 70s. By the millennium it could be 30 million tons. The barrage reduces navigational time, improves the exploitage of the tonnage, and introduces economical ways of shipment (push-boats).

S.

5. Bendefy, L.

Origin and material of the bed load of the Danube. (in Hungarian)
Földrajzi Közlemények, 1: 73-89.
1979.

The Danube enters the ten times deeper Kisalföld Basin at the Dévény Gates after leaving the Basin of Vienna. Owing to the break in its gradient curve, the average grain size of the sediment is decreasing from 10 mm at the frontier to less than 3 mm at Gönyű. Its volume decreses from 0.9 million cubic metres a year to 50 thousand. But the volume of the suspended load is fairly balanced. The majority of the sediment comes from the Alps, the rest from the Little Carpathians.

S.

6. Benedek, P.

About the water quality of the Danube. (in Hungarian)
Hidrológiai Közlöny, 4-5: 193-205.
1986.

It is a summary of the available information on the water quality of the Danube. The barrages induced considerable changes in the chemical, biological conditions and processes of the rivers concerned. A uniform regulation of water quality ought to be developed for all rivers. In each country there are hydrobiological research teams studying the ecological features of the rivers (like at Vácrátót in Hungary). Within the reservoirs the trophicity is to increase. A wider application of toxicological measurements is being proposed. The saprobity is also to increase in the retained

sections, discharging untreated or just partially treated sewage waters into the Danube. The riverbed load is being deposited above the Austrian barrages. Water quality is affected by the suspended load. According to the end values, the section of the Danube above Gönyű is of 1st to 2nd class water quality. Agricultural fertilizers are responsible for the increasing nitrate content. The study offers standards to develop a uniform qualification system of drinking water too.

S.

7. Binder, J. - Turi Nagy, J.:

The influence of the Bős-Nagymaros Barrage System on the water quality of the Danube. (in Hungarian)
Hidrológiai Közlöny, 1: 62-64.
1990.

Owing to the sewage water outlets, the water quality of the Danube had been eventually declining till 1980. From this time on, the effect of the newly built water treating plants have been perceivable. Within the planned reservoir (at Hrusov-Körtvélyes) the waterstream is slowed down, however, the oxygen uptake is intensified. Sedimentation generated silting and filling the riverbed is periodic only. The newly formed microbiological endowments and their effects are not known yet. Changes are influenced by the quality of the inflowing waters and the construction of water treating stations. The establishment of a monitoring network system is therefore necessary.

S.

8. Bisztricsány, E.

About the earthquake hazard in the Carpathian Basin. (in Hungarian)
Földtani Közlöny, 2: 97-107.
1977.

It presents the field intensities of the earthquakes, having occurred in the territory of today's Hungary, answering the MS scale. In the earthquake intensity map the Szigetköz is categorized as a 5 to 6 degree danger zone.

S.

9. Bogárdi, J.

Sediment runoff of the Danube. (in Hungarian)
In: Bogárdi J.: Vízfolyások hordalékszállítása, Budapest, Akadémiai Kiadó pp. 755-766.
1971.

Surveying the sediment transport of the Danube began at the Upper-Danube, although the data are not reliable. The Austrian barrages must have changed the data of the previous measurements. Owing to the gradient profile, the volume of the bed load is much less at Nagybajcs

than at Dunaremete. The sediment deposited in the riverbed is getting finer and finer grained downstream.

S.

10. Breinich, M. - Nagy, L. - Szántó, M.

Development of the conception of the Danube Water Barrage System. (in Hungarian)
Vízügyi Közlemények, 4: 483-500.
1983.

The complex exploitation of the Danube meets the interests of several European countries. Main aims: hydroelectric power plant, navigation and development of a waterway, flood prevention, river regulation, management of water resources, infrastructural development in the catchment area. There are 13 Czechoslovakian and 12 Hungarian modifications of the concept regarding the water barrage system. The researches concerning the realization of the project.

S.

11. Bulla, B.

Physical geography of Hungary. (in Hungarian)
Tankönyvkiadó, Budapest, 423 p.
1962.

The well known geographer of the recent times summarizes the physical conditions of the Kisalföld, along with the other Hungarian landscapes, in this volume. He describes all the important phases of landscape evolution that had formed the present surface of the Kisalföld. The general description of the country's geography is given regarding each physical geographical factor. The characteristic features of each landscape are emphasized and so are those of the Kisalföld. The main features of the Hungarian landscapes are briefly summarized once again in the final chapter of the book.

S.

12. Bulla, B. - Mendöl, T.

Geography of the Carpathian Basin. (in Hungarian)
Nevelők Könyvtára 2. Országos Köznevelési Tanács, Budapest, 611 p.
1947.

The most prominent Hungarian geographers of international fame summerized all the physical and socio-economic geographical knowledge of their time, regarding the whole of the Carpathian Basin. Unlike the works of similar nature published later, it emphasizes and evaluates the spatial interrelationship occurring throughout the Basin. After a general description of the Carpathian Basin, the details of each landscape are also given.

So the reader can get to know both the landscapes and the population of the time dwelling in the Kisalföld too.

S.

13. Cholnoky, J.

The geography of Hungary. (in Hungarian)
In: A Föld és élete VI. 1-529.
Franklin Társ. Budapest.

The most popular Hungarian geographer of his age wrote the geography of Hungary in a serial. After the general description of the Hungarian land, he gave descriptions as well. Many of his findings are the first recognitions and scientific explanations regarding the formation of the alluvial fan of the Danube in the Kisalföld for example. He described the section character (channel formation mechanism) of rivers in order to explain the filling up lower course character of the Upper Danube and the middle course character of the meandering spillstreams (the Mosoni and Little Danubes). He found the right interrelations of the sedimentation in the upper courses too.

S.

14. Csobok, V. - Csománé, Szabó K.

The effect of river canalization on the groundwater of the Szigetköz. (in Hungarian)
VITUKI Annual Report of 1966. 445-454.
1968.

The authors constructed a map showing the expected changes in the groundwater level of the Szigetköz. The applied method had been developed by P.Major (1962). The maximum groundwater level is going to exceed 3 ms in the wash-land of the Danube, while it is going to drop cca 1 m along the Mosoni Danube. The harmful groundwater recession is to be moderated by the building of the intercepting drain network they propose.

S.

15. Csoma, J.

Effect of the Danube barrage system on the sedimentation. (in Hungarian)
VITUKI Annual Report of 1966. Budapest, 311-325.
1968.

In the Pozsony (Bratislava) reach the annual average of the suspended load is 3.8 million cubic metres (6.7 million tons), while that of the bed load is 650 thousand cubic metres, most of which is being deposited above Gönyű. The barrage system has changed the conditions of sedimentation. The discharge of 2-3000 cubic metres per second transports 345 000 tons per second of sediment. The discharge of 1-2000 cubic metres per second transports 430 000 tons per second. 490 000 cubic metres of load

is deposited between 1864 and 1870 riverine kms, while some 60 thousand cubic metres of load is transported below 1856 kms. Concentrated deposition of the bed load causes a lot of problems. Within the raised reach there is no deposition and 70 % of the suspended load is carried downstream with the stream flow of 4000 cubic metres per second. Deposition can occur only where the stream is slowed down (2.9 million cubic metres per year, between 1848 and 1856 riverine kms). It means that the filling up of the 180 million cubic metre reservoir would take about 60 years. Within the power canal there is no deposition expected, however. At minimum stream flow there is a regulated discharge within the abandoned bed.

S.

16. Csoma, J.

Channel changes of the system of branches of the Upper Danube. (in Hungarian)
Földrajzi Értesítő, 3: 309-324.
1968.

After the regulation and the construction of a channel for the normal stream flow of the Upper Danube between 1886 and 1896 a system of branches developed. The investigation of the Doborgazi, Cikolaszigeti, Bodaki, Ásványi and Bagoméri branches shed light upon the evolution of the Szigetköz reach of the Danube. Sedimentation is rather intensive in the first three river branches as shown in the decreasing surface of their beds. They have finer grain sizes than the main riverbed, with the exeption of the Doborgazi branch. Annual sediment transport of the Danube is 8-900 thousand cubic metres, a third of which is deposited in the system of river branches.

S.

17. Csoma, J. - Kovács, D.

Evaluation of the effect of the regulation within the Rajka-Gönyű reach of the Danube. (in Hungarian)
Vízügyi Közlemények, 2: 267-291.
1981.

The evaluation of the effect of the regulations under normal and minimum stream flow conditions, started in 1963, is made defficult by the constant dredging answering the pace of deposition. Regulations improved the conditions for minimum and normal stream flo and increased the sediment transportation capacity of the river. The sedimentation of the branches were equalized to help flood routing in the main bed. It also resulted in a decreasing bank erosion. The main bed has to be maintained regularly between Dunakiliti and Szap after the construction of the barrage as well. Wading depth also increased with a few exeptions and a 2.5 m deep waterway is available.

S.

18. Dóka, K.

Regulation of River Lajta (1786-1935).) (in Hungarian)
Győri Tanulmányok, 5: 219-234.
1983.

The natural surroundings of River Lajta is described and the reasons of regulation are given (there used to be frequent floods due to the sudden gradual drop). The main objective of the regulation were the flood prevention of Moson and Magyaróvár, their constant water supply and flood routing. Irrigation facilities aided agricultural production, however the ensuing groundwater depression dried the meadows.

S.

19. Dóka, K.

Hydrographical information of the Karlsruhe Maps. (in Hungarian)
Vízügyi Közlemények, 1: 64-76.
1986.

Hungarian researchers often visited the famous collection of maps at Karlsruhe, Germany. A map from 1670 displays the region of the Upper Danube on the scale of 1:550 000. Another map from 1667 by de Jamaige also shows this area on the scale of 1:175 000. Another map with topographic details of the region was constructed in 1683 by J.Ph.Hanstein on the scale of 1:100 000.

S.

20. Dudás, Gy.

The future utilization of Europe's inland waterways after 1980. (in Hungarian)
Földrajzi Közlemények, 19: 73-75.
1971.

At an international conference, held at Rusze, the author introduces the Bulgarian expectations and plans in connection with the construction of the Danube-Rhine Canal. He points at the central situation of Hungary along the inland waterway connecting the North Sea and the Black Sea. He refers to the consequences of the enlarged possibilities regarding shipment and navigation.

S.

21. Erdélyi, M.

Natural and economic resources of the Győr Basin and the Barrage Project. (in Hungarian)
Földrajzi Értesítő, 3-4: 457-489.
1983.

The author doubts the order of importance of the aims concerning the

barrage project. He emphasizes the interests of agriculture, water supply and environmental protection at the expenses of navigation and energy production. Considering the hydrogeology of the Basin he expects a possible depression and a poorer quality of groundwater and confined water reserves.

S.

22. Erdélyi, M.

Hydrogeology of the Kisalföld before and after the barrage construction works. (in Hungarian)
Földrajzi Értesítő, 39: 7-27.
1990.

In this study, an experienced researcher of the area deals with the relationships of the groundwater and confined water reserves, the expected changes ensuing after the Bős Barrage is put into operation, the expected consequences of the groundwater supplying system and the ways of its operation. Then he examines the water reserves of the deeper layers to state whether the groundwater of the superficial gravel layers can be made good from them. In his opinion this is no solution. The author considers the barrage in the old riverbed of the Danube more favourable than the construction of a lateral diversion canal for this purpose.

S.

23. Fekete, Gy.

International tasks prior to the construction of the Danube-Main-Rhine waterway system. (in Hungarian)
Közlekedéstudományi Szemle, 8: 281-286.
1991.

The Rhine and the Main are overburdened with navigation compared to the Danube. It will cause a very rapid increase of navigation on the Danube. An international agreement is needed therefore to have uniform conditions regarding inland waterways, harbours, shipyards, doskyards, boats, legal rules, administration and management of navigation.

S.

24. Franyó, F.

Thickness of quaternary layers in the Kisalföld. (in Hungarian)
MAFI Annual Report 1965, 443-458.
1967.

Having processed the data of about 600 deep-bores, the author constructed the profiles of the young sediments forming the Basin of the Kisalföld. So the thickness of the Quaternary sediments could also be mapped. The thickness of the Quaternary fluvial, gravelly sediments between the Mosoni Danube and the Danube (in the Szigetköz) was

found to exceed 200 ms. It is the consequence of the sinking basement of course.

S.

25. Franyó, F.et al.

Explanatory notes on the geological map serial of Hungary on the scale of 200 000 (Győr L-33-VI.) (in Hungarian)
MAFI, Budapest, 157 p.
1971.

The detailed description of the stratigraphic composition and evolution, the lithological, sedimentological, hydrogeological conditions and the mineral resources of the area (including the Szigetköz) is given in this volume. The tables showing the number and discharge of the wells, and the distribution of the mineral resources within the administrative boundaries of each settlement are especially worth mentioning.

S.

26. Environmental impact statement of the Gabcikovo-Nagymaros water barrage system.

(in Hungarian)
VIZITERV Bp. 1-67,+ 25 táblázat + 19 ábra.
1985.

Its task is to summarize the present state of the affected reach of the Danube, the time and nature of the expected environmental changes, the possibly anticipated social responses.
The original Szigetköz landscape has been altered by human activity since the river regulating works between 1886 and 1896. It was not only nature that changed, but society and economy as well. (There was a restructuralization of employment.) The bed of the Danube has an artificial character today (in 1983).

The barrage system influences only the water budget of the banks and the navigation, though these factors affect land use and local society too. The study offers further problems and objectives for research.

S.

27. Göcsei, I.

The Szigetköz. (in Hungarian))
Természettudományi Közlöny, 7: 337-340.
1963.

The author describes the natural landscape of the Szigetköz. He concentrates on the evaluation of the landscape strongly affected by human activity. He writes about the river regulation works in the main bed of the Danube and in the Mosoni Danube.

The characteristic features of the local population are also shown.

S.

28. Göcsei, I.

Lake Kőszegi in the Szigetköz and its evolution. (in Hungarian)
Földrajzi Értesítő, 3: 361-364.
1970.

The origin of the lake north of Győr, near the flood protection dam was not explained. Researchers found that it was probably formed during the 1880 Danube flood, when the Danube overflew the dam. Its greatest depth was 9 m, its length 120 m. To strengthen the dam it was filled up later.

S.

29. Göcsei, I.

Development of the agriculture in Győr-Sopron County since 1945. (in Hungarian)
Földrajzi Közlemények, 19: 51-59.
1971.

Among the other territories of Győr-Sopron County, the author describes the agricultural land of the Szigetköz in detail. He divides the area as low flood plain below 3 m above the 0 point of the Danube, and high flood plain above 3 m. He introduces the factors that are responsible for an advantegous market situation of the local products. Then he compares the crop yields to the national averages, finding the local figures higher. It can be explained with the exploitation of the adavantegous local physical conditions. Favourable marketing possibilities aid the development of animal breeding too.

S.

30. Göcsei, I.

Physical geography of the Szigetköz. (in Hungarian)
Akadémiai Kiadó, Bp. 120 p.
1979.

It has been the most detailed description of the physical conditions of the Szigetköz. In the first part the areal role of each physical factor is being described (geomorphology, climate, hydrogeography, vegetation, soils) on the basis of the most recent results of research, and documented with data. The hydrogeographical conditions are especially well described, considering the questions regarding the water barrage construction works too. The second part of the study presents the facies of the eastern part of the Szigetköz on the basis of ecological surveys (flood plain forest, meadow and pasture inside and outside of the flood protection dams, old beds and ridges, croplands on the flood free plains according to different soil types, sand dunes, levees, pools and pits). He separates three systems of facies (belonging to the low and high flood plains, and to areas

strongly affected by human activity). The volume has an abundant list of bibliography on the topic.

S.

31. Göcsei, I.

Changes in the hydrogeography around Győr. (in Hungarian)
Földrajzi Közlemények, 2: 111-117.
1985.

The Rába-Rábca-Marcal rivers meeting the Mosoni Danube gives Győr a character of hydrogeographical centre. The rivers played an important role in defending its castle. The regulation of the Rába took place in 1890-1893. The Rábca was regulated in 1886-1888 and in 1907 and 1986. The Mosoni Danube in 1907-1908. Navigation had used the Mosoni Danube waterway up to the regulation of the Danube in 1880 and 1888. The recent regulations resulted the replacement of the mouth of the Rábca and the cutoff of the bend of the Mosoni Danube at Püspökerdő.

S.

32. Göcsei I.

Geography of Győr-Sopron County. (in Hungarian)
Győr-Sopron Megyei Pedagógiai Intézet, Győr, 95 p.
1990.

The authors describe the territory of the county landscape by landscape. We can get to know the Győr Basin divided as the Rába Interfluvial, the Fertő-Hanság Basin, the Mosoni Plain and the Szigetköz. The hydrogeography of the county is treated in an independent chapter. The main task of the water barrage system is to establish a capacity of an annual 50 million tons of water traffic as opposited to the present 4.8 million tons. They say the lateral diversion canal of the barrage system helps to avoid flood risks like the ones in 1954 and 1965.

S.

33. Hajósy, F.

Climate of the Kisalföld. (in Hungarian)
Földrajzi Közlemények, 10: 143-156.
1962.

It describes the specific climatic anomalies of the Kisalföld from its surroundings, listing the causes as well. Then the spatial and temporal changes of the climatic elements are described (like radiation, air pressure, wind conditions, vapor pressure, humidity, evaporation, clouds, temperature, precipitation). Finally the study summarizes the main climatic characteristics of the physical geographical mezoregions, one of which is the Győr Basin.

S.

34. Hock, B.

The expected effects of the canalization on the water quality of the Upper Danube. (in Hungarian)
In: A Duna-Majna-Rajna és a Duna-Tisza csatornák megépítésének területfejlesztési hatásai.
ÉVM megbízás, MTA FKI Könyvtára, 1-22.
1973.

The study describes both the present and the anticipated states of water quality and the sewage water outlets. Then it separately deals with the possible effects of the main projects and plants (reservoir, upstream and downstream canals, abandoned bed) on water quality. Finally it summarizes the expected effects of the increased navigation and the altered ice conditions on water quality.

S.

35. Honti, Gy.

Survey of the groundwater conditions of the Szigetköz. (in Hungarian)
Annual VITUKI Report of 1954, 2: 122-134.
1955.

The author surveys the changes of the groundwater table in the Szigetköz answering the water level changes of the Danube. He defines the different water stages of the groundwater following the Danube's water level changes both in space and time. Profiles illustrate the effects of flood waves on the groundwater table.

S.

36. Horváth, L. - Pannonhalmi, M.- Várday, N.

Pollution and water quality in the Hungarian reach of the Danube. (in Hungarian)
Vízügyi Közlemények, 4: 506-519.
1981.

Major pollutions appear in the Hungarian reach of the Danube below the mouth of River Vág. Salinity is between 1.25 - 20 degrees of hardness at the frontier. Its type is calcium-magnesium-hydrogencarbonate. Water quality is 2nd class as far as the oxygen budget is concerned. Biological oxygen demand is between 4 and 7 g per cubic metre. Chemical oxygen demand is slowly increasing from 1st to 2nd class. The values of NO3 and NH3 are also slowly increasing downstream the frontier. The strongest pollution occur at the border section. The orthophosphate pollution is decresing inland the country.

S.

37.Horváth, S.

Tendencies in the development of the Hungarian waterway network. (in

Hungarian)
Vízügyi Közlemények, 48: 239-258.
1966.

The author deals with the then present problems of the navigation in the Upper Danube. The possibilities could not meet the demands of the time. He presents the interests, the expenses and the rentability of the European and Hungarian development of the waterway of the Upper Danube. Waterway transportation is more economical than rail, especially in domestic shipment. Though the development of waterways can only be done within a complex project of establishing harbours, docks, warehouses, shipyards and watermanagement.

S.

38. Ihrig, D.

History of the Hungarian water regulations. (in Hungarian)
Országos Vízügyi Hivatal, Bp. 1-138.
1973.

It is the recent largest scale summary of the regulations of the Hungarian rivers. Dénes Ihrig writes about the general historic outlook and the description of the physical surroundings. The effects of the human activity is described by Zsigmond Károlyi. Then Zoltán Károlyi lists the major phases and results of the Danube regulation in chronological order. He deals with the Upper Danube, the Mosoni Danube, the flood plains of the Duna and the Lajta, and the flood protection and draining of the Szigetköz. Maps, showing the previous and the present conditions of the areas, make the text clear and concise.

S.

39. Illei, V.

Water barraging on the Hungarian reach of the Danube. (in Hungarian)
Vízügyi Közlemények, 1: 95-101.
1975.

The author considers the establishment of the enlarged navigation possibilities, specified by the Danube Committee, the main virtue of the water barrage. The utilization of the hydroelectric power and other resources are only additional achievements.

40. Jakucs, L.

Satellite earth science investigation of the Kisalföld. (in Hungarian)
Földrajzi Közlemények, 32: 217-254.
1984.

In order to interpretate the LANDSAT images of the Kisalföld, the author collets all the mapped, recent results of physical researches of the area concerning each factor from topography to soils, basement geology and tectonics. Then, having compared them with the LANDSAT images, he

analyses them and draws the conclusions. He finds that the images are useful in interpreting especially the linear features of the surface.

S.

41. Jakus, Gy.

Effect of the Bős-Nagymaros Barrage System in the Szigetköz. (in Hungarian)
Földrajzi Közlemények, 3-4: 221-228.
1988.

The environmental impact statement issued in 1985 is not known to the public opinion and this is one of the sources of the worries. The reason for building the lateral navigation canal and the barrage itself lies in the nature of the Danube reach in the Szigetköz. The possible effects and the necessary measures to counterbalance are listed. The original bed was changed during the river regulations as early as 1880. The effects are different in the Szigetköz, because the Dunakiliti damming and backwater raises the groundwater level in the upper Szigetköz area, drops the level in the middle of the Szigetköz, while leaves it unchanged in the lower part of the Szigetköz.

S.

42. Kakas, J.

Climatic regions in Hungary on the basis of physical criteria. (in Hungarian)
Időjárás, 328-339.
1960.

Using the results of earlier attempts and recent meteorological data, the author outlines the climatic regions of the country on the basis of temperatures, precipitation and air motions. He classifies the Szigetköz (along with the Kisalföld) as a region of moderately dry (with water deficit up to 60 mm), moderately warm (with the occurrance of 50-75 summer days) climate and mild winter.

S.

43. Kató, P.

A few topical issues concerning the ecology of the Bős-Nagymaros Barrage System. (in Hungarian)
Hidrológiai Közlöny, 70: 359-366.
1990.

The author is an experienced forest engineer. He considers the ecological problems brought up by the opponents of the barrage system. The forest damage can be compensated by changing tree species. The harm to be done to the agricultural production could also be avoided by the planned water supplementary system outside the slope. The fish stock of the Danube could be supported by weirs in the bed, ensuring about 200

cubic metres of waterflow per second. The game stock is to be altered; the number and species of the big game would drop, while those of the wing game would grow. Eutrophization of the water is caused by the polluting outlets. Their sewage ought to be treated without the barrage system as well. Efficiency calculations will mean loss only in case of the barrage system is not built.

S.

44. Károlyi, Z.

Hydrogeography of the Little Plain. (in Hungarian)
Földr. Közl. 10: 157-174.
1956.

B.Á.

45. Károlyi, Z.

Morphological conclusions of the sediment investigation of the Danube. (in Hungarian)
Földrajzi Értesítő, 6: 11-27.
1957.

Hungarian investigation of the fluvial sediments were started at the Upper Danube in 1941. The author summarizes all the results of the regular measurements having been carried on since then. The bed is being filled up within the Rajka-Szap reach. From there, the sudden bedslope gradient is forming a transition channel. The bed load is gradually getting finer sized and less. Branching off the riverbed ceases, because sedimentation is getting moderate. The study then deals with the characteristics of the sediment transport.

S.

46. Károlyi, Z.

Defining the gravel quantity being sedimented within a reach of the Upper Danube. (in Hungarian)
Vízügyi Közlemények, 39: 169-190.
1957.

The constant sedimentation of the bed load in the Upper Danube is the consequence of the gradual drop, the branching off the bed, and the regulation (bed cutoff) works done in the upper reach. It obstructs navigation, rises water level in the river and in the groundwater of the region. The annual amount of sedimentation was about 150-170 thousand cubic metres that could be removed by constant dredging. It is worth mentioning that owing to the barrages built on the Bavarian-Austrian reach of the river, the sedimentation has been decreasing in the Upper Danube and at some localities the bed has deepened during the last two decades. It is due to the load retaining and antierosion effect of the barrages.

S.

47. Károlyi, Z.

Drifting shoals and shallow formation in the Hungarian reach of the Upper Danube. (in Hungarian)
Hidrológiai Közlöny, 40: 349-358.
1960.

Drifting shoals are characteristic of the accretional rivers. It is induced by the changes of the stream flow regime and the quantity of the load and the alluvium of the bed. These are all characteristic of the Upper Danube. During low water period the migration of the shoals are more intensive, because the bed is exposed to a stronger erosion. However, sedimentation exceeded the scouring. Even well placed dykes could not stop the process, so dredging was unavoidable.

S.

48. Károlyi, Z.

Geography of the waters of the Kisalföld. (in Hungarian)
Földrajzi Közlemények, 10: 157-174.
1962.

It uses the annual water budget to give a general characterization of the watersheds. Then it contains the detailed description of the rivers one by one (Danube, Mosoni Danube, Rába, Rábca, Lake Fertő, Marcal and Lajta). The major data regarding the regulations of each river is also listed.

S.

49. Károlyi, Z.

Hydrography of the Kisalföld and the Alpokalja. (in Hungarian)
In: Magyarország vízvidékeinek hidrológiai viszonyai VITUKI Bp. 57-78.
1965.

It lists and describes the surface waters of the landscapes (the Danube, Mosoni Danube, Rába, Rábca, Marcal, Lajta and Lake Fertő). The major data and their spatial distribution and changes are shown in figures and tables. The importance of regulation and its consequences are emphasized.

S.

50. Károlyi, Z. - Somogyi, S.

Surface streams of the Győri Basin. (in Hungarian)
In: Magyarország tájföldrajza 3. A Kisalföld és a Nyugat-magyarországi peremvidék.
Akadémiai Kiadó, Bp. 98-115.
1975.

Structural topography and the alluvial fans of the rivers define the drainage network. The characteristic alluvial fan of the Danube is caused by its

steep gradual drop. The attributes and the quantity changes of the sediment transport are dealt with. The main bed is artificial and about 100 years old. Hydrological regime is ruled by the climate in the Alps. The times of the high and low water levels are given. Regulation could not ensure the undisturbed navigation. Protective dams are winding due to the system of branches. A lock regulates the regime of the meandering Mosoni Danube of middle course nature. The Rába can be characterized with gradual drop and an evoluting alluvial fan. The Rábca drains the waters of the Hanság, being banked up by the Mosoni Danube. The regime of the Lajta is regulated by a lateral canal.

S.

51. Kerényi, A. - Berki, I.

Environmental consideration of the investigation of the capillary rise in the Szigetköz. (in Hungarian)
Acta Geographica ac Geologica et Meteorologica Debrecina 24-25, 89-98.
1985-86.

The humidity of the overlaying stratum at Dunaszeg was investigated from borehole samples in 1986. Where groundwater reaches the overlying stratum but is not affected by precipitation, there is an interim layer developed. In the most frequent type the overlying layer is under the effect of the capillary rise of the groundwater. At these localities only the depression of the groundwater will do harm. On the other hand, the high level of the groundwater is also disadvantegous, because it de-aerates soil, causing gleyification. In such cases groundwater depression could be useful. The favourable situation means the groundwater periodically reaching the overlying stratum that is thinner than the zone of the precipitation effect.

52. Kollár, F.

Environmental impact of the Gabcikovo-Nagymaros Barrage System in Hungary. (in Hungarian)
Inz. Stvby. 29. k. 7/8-sz, 289-290.
1981.

The favourable effects are the improved waterway conditions, the ceased draft limitations of ships, the industrial development following the improved transportation, the recreational possibilities of the shoreline, the huge water body improving microclimate and the better water supply of the bank-filtered wells. The conditions of agricultural production are also improving in the Szigetköz, owing to the ensuing constant level of groundwater table. The disadvantages are an increased protection needed outside the dams because of the permanently raised level of the groundwater table; and a total change of plant species at certain localities.

S.

53. Korompai, G.

Changes in the structure and direction of the developing Danube

shipping. (in Hungarian)
Földrajzi Értesítő, 19: 451-470.
1970.

Analysing the physical factors influencing the regime of the river, the author points at the necessity of the canalization of the Danube in order to maintain navigation within the reach between the mouths of the Inn and the Sava. Upstream traffic of navigation exceeds downstream shipping as a consequence of the economic evolution and speciality of the region. It is the economic backwardness of the region that is responsible for the relatively low degree of the waterway utilization compared to other western European rivers of similar size. Budapest used to be the first among the Danube harbours in 1950. It lost its leading position due to the dynamic growth of shipping in the neighbouring countries.

S.

54. Kovács, Gy.

The Bős-Nagymaros Barrage System. Plans, worries, tasks. (in Hungarian)
Sorskérdéseink. Akadémiai Kiadó, Bp. 9-31, 19.
Magyar Tudomány, 4: 249-271.
1986.

The task, the realization and the efficiency of the barrage system are introduced. The description of the barrage system is given. The main task is to have an undisturbed waterway. It could save an annual 4.8 billion Forints transportation expense in 1986. The arguments concerning the barrage system are put down. Among these the author gives sufficient answers to the worries below: depression of the groundwater level, the main bed losing its borderline function, drying of the branches, destruction of the wildlife, polluting the confined aquifers of the Szigetköz, the harmful effect of the backwater within the Mosoni Danube, caused by the peak load time operation of the Bős power plant. To manage the sudden environmental changes, a monitoring system ought to be established.

S.

55. Lászlóffy, W.

Hydrogeography of the Danube. (in German)
Limnologie der Donau Lf. 1. Stuttgart, 16-57.
1965.

The excellent Hungarian researcher of the Danube wrote about the hydrogeography of the river in the proceedings edited by an international board. He describes the system of the river, the channel conditions, the regime, the changes of water temperature and ice phenomena and the sediment conditions all along the Danube, using many data and figures. This is a good work for comparing the Szigetköz reach of the river to the lower and upper courses.

S.

56. Liska, M. B.

Problem of the Gabcikovo-Nagymaros Barrage System. (in Hungarian)
Hidrológiai Közlöny, 4: 198-201.
1991.

The main objectives of the barrage system are energy production, improved navigation possibilities, flood protection. The incised river is depressing groundwater level in its original state as well. To maintain the present situation some 350 cubic metres per second discharge is needed. The best solution is to realize the original plan.

S.

57. Lóczy, D. - Balogh, J.

Ecofacies mapping in the Danube flood plains. (in Hungarian)
Földrajzi Értesítő, 1-4: 71-80.
1990.

The authors prepared an ecofacies map of a test area at Győrújfalu to reveal the ecological changes to be caused by the planned barrage. They also used satellite image data. They developed a proposal to site the intercepting drain network to be possibly constructed.

S.

58. Márföldi, G. - Rétvári, L.

Geophysical proposals for the environmental impact survey of the Bős-Nagymaros Barrage System. (in Hungarian)
Földrajzi Értesítő, 40: 25-38.
1991.

The authors summarize the environmental impact of the barrage system as they expect. Then they introduce the geophysical methods of environmental impact statement (chemical analyses, remote sensing, pollution measurements, cement superficies and stratigraphic analyses, seepage rate, engineering geophysical probing, and aerial geophysics). The technical and economic conditions of the barrage system has to be re-evaluated on the basis of the modern geoscientific findings.

S.

59. Miklay, F. - Molnár, L.

Soil properties of the Mosoni Plain. (in Hungarian)
Agrokémia és Talajtan. 17: 495-506.
1968.

The authors describe the factors of soil formation in the plain lying between the Mosoni Danube and the Hanság region. The groundwater is an important agent in the soil formation of the area. The dominating soil types of the region are soddy-alluvial soil on the west, meadow

chernozem on the east and the different subtypes of meadow soil in the places of higher groundwater.

S.

60. Mistéth, E.

Earthquake resistance of the Danube barrage system. (in Hungarian)
Vízügyi Közlemények, 2: 184-303.
1987.

According to the MSK (Medvegyev-Sponheurer-Karnik) scale, the region including the Komárom area, has 6-8 degrees of earthquake liability. The MSK scale was accepted by the UN in 1964, and the 6-8 degrees mean badly damaged buildings in case of earthquake.
The suspectibility of building damages is 5 %, that of the reservoir dam is 7 %, while that of the upstream canal is 2.3 %.

S.

61. MTA

Report on the Interdisciplinary Committee of the Presidium. February 1983. (in Hungarian)
Hungarian Academy of Sciences. Budapest.
1993.

B.Á.

62. Nagy, L.

Development of the Danube regulation. (in Hungarian)
Vízügyi Közlemények, 4: 575-583.
1983.

Technical developments and social demands induced the utilization of rivers by damming some 100 years ago. The first power plant on the Danube was built at Kachlet in 1927 in the Bavarian reach. The barrage systems of the Danube, including the Hungarian reach, was designed by the Comecon of the socialist countries. One of these systems was the Bős-Nagymaros. The barrages of the Bavarian and Austrian reaches operate hydroelectric power plants without reservoirs. Their prime costs and overhead expenses are less than one tenth of those of the coal fuelled power plants.

S.

63. Nagy, L.

Utilization of the Danube. (in Hungarian)
Földrajzi Közlemények, 1-2: 55-60.
1988.

The study lists the types of river utilization, the present situation on the

Danube and the future prospects of development. It also states the tasks of the Bős(Gabcikovo)-Nagymaros Barrage System, the experiences and the plans regarding the realization of its complex utilization. The main objectives to achieve are energy production, improved navigation and avoiding flood risk.

S.

64. V. Nagy, I.

The Danube-Main-Rhine waterway. (in Hungarian)
Hidrológiai Közlöny, 6: 338-342.
1990.

The Danube Committee decided to have a 3.5 m deep waterway on the Danube below Vienna in 1962. At present the whole Hungarian reach is being deepened because of the Austrian barrages. In spite of this there are 17 fords within the 60 km long reach between Rajka and Gönyű, degrading the navigational capacity of the main reach. Maintaining the 2.5 m depth needs constant dredging and channel control. The barrage with lateral canals would be the best solution. Drying up the eastern part of the Szigetköz and pollution of the water could be avoided only by further expensive projects. Pollution of the water has already been going on, with 0.5 million cubic metres of sewage discharging into this Danube reach from the Slovakian side daily, and 1.5 million from the Hungarian side.

S.

65. Nádas, P.

Expected changes of the Danube navigational conditions. (in Hungarian)
Közlekedéstudományi Szemle, 1.
1991.

The study deals with the problems of inland waterway transportation on the basis of the proceedings issued after the conference of the European Ministers of Transportation held in November 1988. It surveys the situation of the Hungarian reach of the Danube being part of the Danube-Main-Rhine waterway. The worst reach of the Danube between Budapest and Rotterdam is the section forming the Hungarian-Slovakian borderline. According to the information issued by the Ministry of Transportation of the Bavarian Provincial Government, the transportation expense of one freight ton was 24.4 pfennig by road, 12.8 by rail and only 3.9 by inland ship in Germany in 1987.

S.

66. Pális, P.

Insular country on the Danube. (in Hungarian)
Budapest.
1956.

It is an evocative description of the Szigetköz flood plain by a journalist. It

includes the history of the 1954 flood through the personal experiences and memories of the local residents.

S.

67. Pánczélos, A.

Preconditions and expected effects of the great scale projects of the Danube navigation on water management. (in Hungarian)
In: A Duna-Majna-Rajna és a Duna-Tisza csatornák megépítésének területfejlesztési kihatásai.
ÉVM megbízás. MTA FKI Könyvtára, 1: 8-26.
1973.

The author introduces the technical preconditions of the planned barrage. Then he summarizes its expectable effects on the flood and excess water control, on the conditions of ice and sedimentation, on the transport possibilities, energy production, and land cultivation.

S.

68. Pécsi, M.

New data of the Bratislava-Budapest reach of the Danube regarding valley evolution and morphology. (in Hungarian)
Földrajzi Értesítő, 5: 21-41.
1956.

The author applied up-to-date material tests to investigate the distribution and age of the terraces along the above reach of the Danube. Maps show their localities and profiles show their structure. Within the Szigetköz reach there are four profiles in tables showing their height. His data concerning the Szigetköz Danube reach are valid even today.

S.

69. Pécsi, M.

Formation and geomorphology of the Hungarian Danube valley. (in Hungarian)
Földrajzi Monográfiák 3.
Akadémiai Kiadó, Bp. 342 p.
1959.

The author summarizes his results of a decade long research in this volume. The Danube reaches of different structures are described by a detailed and comparative method. In the Kisalföld reach he excellently describes the flood plain levels of the vast alluvial fan being still built. He also describes their formation, the different natures of their evolution, and their present situation in and outside the dams. He gives details of the young tectonic, crustal movements and their effect on the mechanism of the riverbed evolution, Finally he summarizes the theories explaining the formation of the terraces of the valley and outlines the necessary further investigations.

There is an abundant list of bibliography on the topic too.

S.

70. Pécsi, M.

Scale of the Quaternary tectonic movements along the Hungarian section of the Danube valley. (in Hungarian)
Geofizikai Közlemények, 8: 73-85.
1959.

The author investigated the scales of the Quaternary level changes on the basis of the elevation of the present fluvial sediments, especially terraces, above 0 water stage. The greatest elevation along today's Danube bed was detected within the mountainous reach between Esztergom and Vác, while the greatest depression was found in the Szigetköz reach.

S.

71. Pécsi, M.

A Kisalföld geomorfológiai képe. (in Hungarian)
Földrajzi Közlemények, 10: 113-138.
1962.

It presents the latest geomorphological findings of the time, concerning the formation and evolution of the Kisalföld region. The author describes the evolution of the Danube's alluvial fan in the Kisalföld, as the outcome of an interaction of tectonic movements and changes in climate. Figures illustrate the process. After the general description of the morphological evolution, he deals with the mesoregions (the Győr Basin, the Fertő-Hanság Basin, the Rába Interfluvial, the Mosoni Plain) one by one.

S.

72. Pécsi, M.

The formation of the Danube flood plain levels regarding agrogeography. (in Hungarian)
Földrajzi Közlemények, 92: 267-271.
1968.

The study deals with the structure and formation of the types of the Danube flood plain. The Kisalföld section is outlined as an accumulative flood plain situated in an alluvial fan. It can be divided into low and high flood plains. Their relative elevation correlates directly with the normal and maximum stream flow of the Danube. The sedimentation of the abandoned beds in the wash-lands and the meanders undergoes different stages (like being linked to the main bed, being detached, dry, filled up, turning into bog, relict bed); this process is modified by the consequences of human activity.

S.

73. Prinz, Gy. - Cholnoky, J. - Teleki, P.

Hungarian Geography. (in Hungarian)
Kir. Magyar Egy.-i Nyomda Bp. I. 1-385, II. 1-434, III. 1-475.

It is a series written by the prominent scientists of Hungarian geographers in the 30s. It describes the Carpathian Basin. Each landscape is introduced in detail. So is the Kisalföld (with the Szigetköz as a part of it). The transitional nature of our climate is stressed. It is reflected in our landscapes and in the regimes of our rivers too. The situation of the country is compared to the whole of Europe too. The importance of the navigable rivers is also treated.

S.

74. Réthly, A.

Earthquakes of the Carpathian Basin. (in Hungarian)
MTA Budapest.
1952.

Maps, showing the earthquake intensities and frequencies, were constructed on the basis of the data of the earthquakes having occurred in the Basin between 451 and 1918. The territory of the Szigetköz was found to be seismic, and Bratislava, Magyaróvár and Komárom were identified as seismic centres.

S.

75. Rétvári, L.

The Danube barrage system under construction. (in Hungarian)
Földrajztanítás, 30: 80-83.
1987.

The author writes about the expectable economic advantages and environmental disadvantages of the barrage system for teachers of geography. He considers impartially the positive and negative impacts. He suggests that the expected advantages can only be useful if water quality is improved.

S.

76. Rónai, A.:

Hydrogeological study of the Kisalföld. (in Hungarian)
Hidrológiai Közlöny, 40: 470-484.
1960.

The author is an excellent researcher of our groundwaters. Living up to his reputation, he writes about the subsurface conditions of the landscape including the Szigetköz. He describes the topography, the fluvial deposits, the size of the gravel layers, the mean and the specific discharge, water pressure and temperature of groundwater wells, the level of groundwater,

the occurrance of confining stratum, the changes of groundwater levels and its chemical properties. All the above are shown in maps of the region. He finds that the regime of the Szigetköz groundwater stongly depends on the water level of the Danube.

S.

77. Rónai, A.

Groundwater conditions in the Kisalföld. (in Hungarian)
Földrajzi Közlemények, 10: 175-182.
1962.

It concentrates on the factors defining the groundwater regime and flow; and the different roles of these factors under different circumstances. The study is illustrated with maps showing the specific discharge of groundwater wells, the average depth of groundwater table, and the relationship between the water regimes of the rivers and groundwater wells. The types of groundwater regime and their chemical characteristics are also displayed.

S.

78. Sárközi, Z.

Water management and agriculture in Győr and Moson County. (in Hungarian)
Győr. 134 p.
1955.

This study was topical by the great Danube flood of 1954. The author describes the causes of the floods in this reach of the Danube. Using historic data he considers the characteristics of the floods of the Middle Ages. He describes the old drainage system of the area. The ways of water utilization were different, always answering the demands of the age. At some places man had to regulate the rivers even in the old days. Navigation used to take place on the Mosoni Danube. He deals with river regulation in detail, concerning not only the Danube but its tributaries too. He also considers the advantageous and disadvantageous consequences of the river regulations in the region. The changing of the hydrogeographical conditions is reflected in the changes of agricultural production.

S.

79. Sikora, A. - Komora, J. - Brachtl, I.

River regulation issues of the Gabcikovo-Nagymaros Barrage. (in Hungarian)
Magyar Hidrológiai Társaság Duna Ankét, Bp. 94-118.
1977.

It presents the data regarding the planned Dunakiliti Reservoir, its main task of which is to ensure a 3.5 m water depth for navigation. The

characteristics of sediment runoff are described. The main agents of sediment transport are the discharges between 1000-3000 cubic metres. The bed load is deposited in the upper section of the reservoir, between 1863-67 kms downstream, while the suspended load between 1844-52 kms. Stream velocity is the greatest in case of a 2000 cubic metre discharge, because backwater slows it down in case of a greater discharge. The connection of peak load time operation and navigation is described. Complete freezing will be more frequent and longer lasting within the reservoir. The danger of ice gorges is mentioned. The changes of impounding heads are stated at ice flow. In severe winters the lateral diversion canal can freeze, blocking navigation. In the tailrace canal ice does not form a complete cover.

S.

80. Simon, T.

Natural vegetation cover of the Kisalföld. (in Hungarian)
Földrajzi Közlemények, 10: 183-193.
1962.

The study describes the distribution of the elements of the flora and the evolution of the original vegetation in diagrams. The vegetation of the region is introduced through the illustrated description of the succession of the boggy, swampy, oak and sandy associations. Finally the semi-cultural associations are described.

S.

81. Somlyódy, L.

The Hungarian - Czecho-Slovakian Danube Zone and its development. Report for official use. (in Hungarian)
Budapest, 1990.
1990.

B.Á.

82. Somogyi, S.

Tasks regarding the realization of an international, transcontinental waterway on the Hungarian Danube reach. (in Hungarian)
Földrajzi Értesítő, 2-4: 255-264.
1976.

After the construction of the Rhine-Danube Canal, the Bratislava-Győr reach became the narrowest section of the waterway with an annual 7 million tons of shipment passing. It could be overcome by a lateral navigational canal, being the diversion canal of a power plant in addition. The realization of this plan has several preconditions. Some of them are stressed under point 8. These are the maintenance of water quality and meeting the ecological requirements.

S.

83. Starosolszky, Ö.

Effect of the barrages on the ice regime. (in Hungarian)
Vízügyi Közlemények, 3: 345-382.
1989.

Ice appears and forms a complete cover sooner and melts later in the headstream canal. Ice cover can get thicker on cold winters and its drifting barriers could raise water level, was it not controlled by the barrage. In the tailwater canal, water freezes only in case of extremely cold weather, or if upstream ice arrives. Ice cover can spread upwards in the tailwater, but without being fed from upstream it cannot reach the barrage. If the flood wave does not break off the ice cover in the reservoir, ice can melt there without being let through the barrage. But if it does have to be let through, it can cause barriers in the downstream canal, giving rise to backwater. The barrage therefore changes the natural ice regime of the rivers.

S.

84. Stefanovics, P. - Góczán, L.

Soil conditions in the Hungarian part of the Kisalföld. (in Hungarian)
Földrajzi Közlemények, 10: 195-208.
1962.

The authors list the local factors of soil formation and their interrelations in forming local soil types. Then they describe the special features of the soils of the mesoregions. They deal with the soils of the Szigetköz, the Mosoni Plain, the Fertő-Hanság Basin and the Rába Interfluvial in the Győr Basin region. They illustrate each soil type with profiles. They show their soil and erosion maps of the landscape.

S.

85. Szabó, I. M.

The expected effect of the Bős-Nagymaros Barrage System on the quality of the Danube and the groundwater of the region. (in Hungarian)
Magyar Tudomány, 35: 930-938.
1990.

The author deals with the expected water quality problems within the reach of the Danube below Bős (Gabcikovo). He states the consequences of the deficient oxygen uptake caused by the reduced flow velocity. These (like increased algalization, enrichment of bacteria, biomass and humus), together with the agricultural and industrial pollution and other bacteriological, virological septic effects endanger the future quality of the river. The water of the Dunakiliti Reservoir is threatened by the pollutions from abroad.

S.

86. Szádeczky-Kardoss, E.

On the formation of River Lajta. (in Hungarian)

Földrajzi Közlemények, 60: 27-31.
1937.

The prominent geologist, having launched the Hungarian analyses of sediments, was the first to detect the evolution of the river reaches from their deposits. It was the device applied to reconstruct the varied stages of evolution of River Lajta. A recessional downcutting stream from the Kisalföld turned the Lajta into its present direction of flow from its former direct mouth into the Danube.

S.

87. Szádeczky-Kardoss, E.

Geology of the Hungarian Kisalföld with respect of the gold deposited in the Danube sediment. (in German)
Mitt. d. berg.-u. hüttenm Abt. Sopron, 442.
1938.

Our famous geologist was the first to introduce the up-to-date analyses of sediments in Hungary in order to be able to detect the exact formation of the certain reaches of the rivers. It was done for the Upper Danube too. The reach was found rather young, having been formed during the Pleistocene in different stages. He also dealt with the factors influencing the gold content in the Danube sediments. The prospective gold reserves of the deposits have not encouraged mining establishments and investments of greater scale eversince.

S.

88. Timaffy, L.

Hydrography of the Szigetköz. (in Hungarian)
Mosonvármegye ny. Mosonmagyaróvár. 30 p. 8.t. 1 térk.
1939.

It is a doctorial dissertation dealing only with the hydrography of the landscape. First it surveys the role of water in forming landscape, on the basis of theories, being discredited in today's knowledge. Then it descibes in detail the followings: the formation of the Danube's alluvial fan, the topography of the region, the evolution and regression of the branches of the river, the Mosoni Danube, the regime of the Danube and that of its ice, deposition of its load, its channel formations, the process and the consequences of the channel control, regulation and flood prevention.

S.

89. Tóth, J.

Environmental effects and expected ecological problems of the Bős-Nagymaros Barrage System. (in Hungarian)
Földrajzi Közlemények, 31.k. 1.sz. 1-11.
1983.

When examining the ecological, hydrobiological effects of the barrage system, we have to consider the three sequent phases of the biological substance and energy flux, namely production, accumulation and decomposition. Society express great interest in production and accumulation, while decomposition is mainly left to nature. The water barrage system is not causing pollution in itself, however, it reduces the potential of natural decomposition. It results in the overproduction of organic materials, degrading indirectly the quality of water which is simply water pollution.

S.

90. Tőry, K.

Elevation of the channel of the Upper Danube. (in Hungarian)
Vízgazdálkodás, 1: 27-30.
1951.

The author describes the elevation of the Szigetköz reach of the Danube with the data of water level observations. The elevation is the outcome of the gradual drop and its consequent energy loss within the reach between Bratislava and Gönyű. He finds that the river regulation (lateral) structures, built too wide, also contribute to the riverbed elevation.

S.

91. Tőry, K.

The Danube and its regulation. (in Hungarian)
Akadémiai Kiadó. Bp. 1-454.
1952.

The author knows well the territory of the Szigetköz too and he gives a detailed description of the whole hydrological region of the Danube. Then he deals with the characteristic features of the reaches of the river (water regime, ice conditions, sediment transport, navigational possibilities etc). He summarizes the the regulations and the artificial changing of the channel within the Danube reaches. Finally he introduces the undergoing regulating works, the plans to build canals and other establishments. This volume is an essential study for any investigations concerning the Danube.

S.

92. Völgyi, J.

The Szigetköz. (in Hungarian)
Győregyházmegyei Alap ny. Győr. 64 p.
1937.

This is a doctorial dissertation of an author, being well acquainted with the landscape. The hydrographical chapter is the most prominent one in the study that is based on the knowledge of the time. It deals in detail with the formation of the sand banks and islands, the system of river branches, the

ice conditions, the results and the deficiencies of flood prevention works. It considers the relationships between man and nature, and the socio-economic development of the local population. The local importance of fishing is also mentioned.

S.

93. Zajicek, V. - Gyalokay, M.

Groundwaters of the Czechoslovakian part of the Kisalföld. (in Hungarian)
Földrajzi Értesítő, 9: 31-63.
1960.

The study is concerned with the groundwater conditions of the Csallóköz and the adjoining areas. It also outlines the effects of the future hydrotechnical construction works. It is the reason why it surveys the effects of the Danube and its tributaries on the groundwater of the region. These effects can be traced as far as a 8-10 km strip along the channel, getting narrower downstream. At flooding, the groundwater table reaches the surface and excess water has to be drained off. The Danube flood wave occurring during droughts provide possibility for the irrigation of the cultivated lands in the flood plain. The direction of the groundwater flow is controlled by the water level of the Danube, although, it is getting parallel with the river. The groundwater quality is also influenced by the Danube.

S.

94. Zorkóczy, Z.

Regulation of the Danube. (in Hungarian)
Vízügyi Közlemények, 1: 54-96.
1969.

Today's Danube channel of normal stream flow was formed between 1886 and 1896. Regulations were repeated under minimum stream flow, but the continuity of navigation could not be guaranteed, due to the constant deposition of the load and the formation of the fords induced by the break of the gradual drop. The construction, started at the Nagybajcs reach in the 60s, on the basis of model tests, was successful. The channel conditions of the regulated reach were stabilized, but the deposition increased upstream. The systems of branches were to be locked off in order to keep water in the main branch.

S.

EARTH SCIENCES

95. Balla, Z.

Tectonic analysis of the Dunakiliti region. (in Hungarian)
Manuscript, Budapest. p. 117.
Study Cabinet of the Seizmological Observatory of the Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences.
1991.

The most important element of the Kisalföld region's depth structure is the line of the Rába river, the border between the alpine and the central range of mountains. Its state is up to now uncertain. It is interpreted both as an overlay limit on seizmic segments and as a steep fracture.

T.L.

96. Bisztricsány, E.

About the earthquake hazard in the Carpathian Basin. (in Hungarian)
Földtani Közlöny, 2: 97-107.
1977.

It presents the field intensities of the earthquakes, having occurred in the territory of today's Hungary, answering the MS scale. In the earthquake intensity map the Szigetköz is categorized as a 5 to 6 degree danger zone.

S.

97. Bondár, I.

Impact of the local geological conditions on the expectable accelerations in the area. (in Hungarian)
Manuscript, Budapest. p. 14.
Study Cabinet of the Seizmological Observatory of the Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences.
1992.

The expectable impact of an earthquake is influenced in addition to the intensity of the quake by the geological structure of the area. In a loose, sedimentary area quakes become more intensive of the energy is concentrated in the most dangerous domain of the spectrum respectively.

T.L.

98. Dávid, Gy.

Depth structure of the Kisalföld region reflected by seizmic measures. (in Hungarian)
Manuscript, Budapest. 25 pages and 4 annexes.
Study Cabinet of the Seizmological Observatory of the Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences.
1992.

A review and structural interpretation of seizmic measures carried out in

the Kisalföld region with the aim of exploring raw material resources.

T.L.

99. Dobrovolni, K. - Nemesi, L.

Report on the comprehensive engineer geological investigation of the dike body and the subsoil at the main line on the right side of the Dunakiliti reservoir. (in Hungarian)
Manuscript, Budapest, 19 pages and 22 annexes.
Study Cabinet of the MÁELGI.
1991.

Based on geophysical measures the physical state and structure of the weir at Dunakiliti constructed in the 1980s, as well as the structure of the dike body joining to the weir that was constructed earlier and strengthened in the 1980s is analysed as well. At the main protecting section lithologic structure of the subsoil is also dealt with.
An important information of the horizontal resistance segments is that they reveal ancient river bed at several points under the dikes. Such high resistance, gravelly beds of some hundred meter width resulted in bursting of the dam at the Kőrös rivers.

T.L.

100. Balla, Z. - Czakó, M.

Geological map of the planned Nagymaros Barrage area.
Archives of the Hungarian Geological Survey. (in Hungarian)
Map sheet I-34-2-17.
1978.

B.Á.

101. Erdélyi, M.

Hydrogeology and Hydrodinamics of the Little Hungarian Plain. Contribution to the Quaternary and landscape research. (in German)
Wien, pp. 107-123.
1978.

B.Á.

102. Erdélyi, M.

Water supply reserves of Budapest. (in Hungarian)
Budapest 22 (8): 6-8.
1984.

B.Á.

103. Erdélyi, M.

Hydrogeology of the Danube zone between Dunaalmás and Nagymaros.

(in Hungarian)
Hitel 10: 26-28.
1989.

B.Á.

104. Erdélyi, M.

Hydrogeology of the Little Plain now and after the construction of the barrages. (in Hungarian)
Földr. Ért. XXXIX (1-4): 7-28.
1990.

B.Á.

105. Erdélyi, M.

The hydrogeology of the Hungarian upper Danube section (before and after damming the river)
Hungarian Natural History Museum. Budapest. p. 1-115.
1994.

B.Á.

106. Erdélyi, M. - Gálfi, J.

Surface and subsurface mapping in hydrogeology.
Wiley and Sons, Chichester etc., and Akadémia Kiadó Budapest, pp. 5-384.
1988.

B.Á.

107. Goschy, B.

Aptitude test of the dikes of the Gabcikovo-Nagymaros Barrage System. (in Hungarian)
Manuscript, Budapest. 37 pages and 9 annexes.
Study Cabinet of the Seizmological Observatory of the Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences.
1991.

The weakest link of the Dunakiliti reservoir is the dike system encircling the reservoir, since it is the biggest structure regarding its volume, thus probability of the cause of troubles increases proportionately, on the other hand it is the most heterogeneous structure concerning both its size, formation, material and quality as well.

T.L.

108. Hajósy, A. - Scharek, P. - Tóth, Gy. - Tóth, L.

Geological investigations in the Szigetköz region. (in Hungarian)
Magyar Geofizika, Budapest. Vol. 34., No. 2.
1993.

The paper outlines the state of geological and geophysical investigations in the Szigetköz region and based on research reports and evaluations on this subject it summarizes the knowledge available on the geological structure of the region.

T.L.

109. Mistéth, E.

Earthquake resistance of the Danube barrage system. (in Hungarian)
Vízügyi Közlemények, 2: 184-303.
1987.

According to the MSK (Medvegyev-Sponheurer-Karnik) scale, the region including the Komárom area, has 6-8 degrees of earthquake liability. The MSK scale was accepted by the UN in 1964, and the 6-8 degrees mean badly damaged buildings in case of earthquake.
The suspectibility of building damages is 5 %, that of the reservoir dam is 7 %, while that of the upstream canal is 2.3 %.

S.

110. Réthly, A.

Earthquakes of the Carpathian Basin. (in Hungarian)
MTA Budapest.
1952.

Maps, showing the earthquake intensities and frequencies, were constructed on the basis of the data of the earthquakes having occurred in the Basin between 451 and 1918. The territory of the Szigetköz was found to be seismic, and Bratislava, Magyaróvár and Komárom were identified as seismic centres.

S.

111. Rónai, A.

Groundwater of the Hungarian Lowlands. (in Hungarian)
Hung. Geol. Survey (Annals) XLVI (1): 3-247. Maps.

(Rónai, A. and Boczán, B.) Scale 1:400.000.
1956.

B.Á.

112. Schweitzer, F.

Ancient geographical conditions of Komárom and its surroundings, with special respect to the geomorphological formations resulted by structural movements. (in Hungarian)
Manuscript, Budapest. 23 pages and 3 annexes.
Study Cabinet of the Seizmological Observatory of the Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences.

1992.

An analysis of the geomorphological formations in the area and conclusions on occasional structural movements.

T.L.

113. Tarcsai, Gy. - Ferencz, Cs. - Büttner, Gy. - Timár, G. - Bognár, P. - Pásztor, Sz. - Székely, B.

Investigation on the environmental impacts of the establishments in the Gabcikovo region by satellite remote sensing. (in Hungarian)
Manuscript, Budapest. 29 pages.
Study Cabinet of the Geophysical Department of the ELTE University.
1992.

The investigation aimed at the appraisal of environmental impacts of the construction at Gabcikovo by using LANDSAT pictures of 52*79 MSS size and 30*30 TM pixel size. Analyzing the photographs it was stated that natural environment was considerably damaged and in the area of the reservoir it was entirely demolished by the construction.

T.L.

114. Ubell, K.

Groundwater of the Little Plain. (in Hungarian)
Hidr. Közl. 39: 165-175.
1959.

B.Á.

115. Zsíros, T.

Probability of earthquake imminence at Dunakiliti. (in Hungarian)
Manuscript, research report, Budapest. p. 1-26.
Study Cabinet of the Seizmological Observatory of the Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences.
1991.

Based on the distribution of source areas and the frequency of quakes related to the source areas, as well as on the relationships for intensity slackenings the yearly expectable frequency of quakes and the earthquake imminence related to 1000 years has been determined in the intensity interval of IV < 1° < IX.

T.L.

116. Zsíros, T.

Earthquake imminence of Gabcikovo. (in Hungarian)
Manuscript, Research report, Budapest. 28 pages.
Study Cabinet of the Seizmological Observatory of the Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences.

1992.

Based on the distribution of source areas and the frequency of quakes related to the source areas, as well as on the relationships for intensity slackenings the yearly expectable frequency of earthquakes has been determined for Gabcikovo.

T.L.

FLOW REGIME AND SEDIMENT REGIME OF THE DANUBE RIVER

117. Bakonyi, P. - Hankó, Z. - Hegedüs, M. - Laczay, I. - Liebe, P. - Mistéth, E. - Starosolszky, Ö.

Evaluation of unexpected events in connection with putting into operation of the Dunacsúny-Bős part of the Bős-Nagymaros Barrage System.
Manuscript, research report in Hungarian,
Budapest, 1-76. Report collection of VITUKI.
1992.

Circumstances and consequences of occasional breaks on the right-bank levee of the reservoir along the riverside or on the flood protecting dike. Rating the flood-conveying capacity of the Dunacsúny-Bős subystem. Revealing the characteristics of negative shock waves created by sudden shutdown of the Bős hydropower plant. Characteristics of flood waves starting on the Old Danube after a levee break.

R.L.

118. Bartha, P. - Body, K. - Laczay, I. - Sass, J. - Szekeres, J.

Checking the bed deformations on the Danube Stretch at Paks and forecasting the flow and ice regime.
Manuscript, research report in Hungarian,
Budapest, 1-8. Report collection of VITUKI.
1992.

Informations on the assuring of water supply for the nuclear power plant in case of design low flow of Danube River. Regular forecast of flow- and ice regime. Checking of the deformations of the riverbed.

R.L.

119. Bogárdi, J.

Theory of sediment movement.
Book in Hungarian,
Akadémiai Kiadó, Budapest, 1-547.
1955.

Monographic summary of knowledge referring to the origin and transport of bed load and suspended sediment. Investigations and measurements on Hungarian rivers concerning sediments. Results obtained so far by sediment measurements at 7 principal gauge sections of Danube River. Review of results obtained from sediment research on Danube.

R.L.

120. Bogárdi, J.

Sediment transport in alluvial streams.
Book.
Publishing house of Hungarian Academy of Sciences, Budapest, 1-826.
1974.

Monographic summary and review of theories developed for the description and calculation of suspended sediment and bed load transport in Hungary and in abroad. Development of sediment measurement techniques in laboratory and in the field.
Processed results of sediment measurements carried out at the principal gauge stations on Danube River before 1966. These data refer to the natural sediment transport processes almost unaffected by river damming and industrial dredging. Thus, they form a very important base of comparison for all recent sediment research and computations.

R.L.

121. Bognár, S. - Rákóczi, L.

Estimation of sedimentation of the Dunakiliti reservoir and the sediment regime of the Danube stretch affected by the Bős-Nagymaros Barrage System.
Manuscript, research report in Hugarian,
Budapest, 1-22. Report collection of VITUKI.
1987.

Effect of the peak-energy production by the Nagymaros power plant to the Danube reach Nagymaros-Dunaújváros. Application of a hydrodynamic model to the same river reach. Distribution of mean velocities, shear stresses and bed-load discharges along the river course. Characterization of the specific bed-load discharges.

R.L.

122. Bognár, S. - Rákóczi, L.

Estimation of sedimentation of the Dunakiliti reservoir and the sediment regime of the Danube stretch affected by the Bős-Nagymaros Barrage System.
Manuscript, research report in Hungarian,
Budapest, 1-18. Report collection of VITUKI.
1988.

Establishing the data base for the Danube reach Bős-Nagymaros and the simulation model for the sediment transport. Calculation of the roughness coefficients and the characteristics of the bed material. Summarizing the results in a for directly applicable for the further steps of numerical modelling.

R.L.

123. Bognár, S. - Rákóczi, L.

Determining the present status and numerical estimation of the changes in the sediment regime and in the riverbed characteristics along the Danube reach between Rajka-Dunaújváros.
Manuscript, research report in Hungarian,
Budapest, 1-34. Report collection of VITUKI.
1989.

Main conclusions drawn from the series of sediment measurements carried out in 1988-89. Recommendations for the continuation and viewpoints of the field data collection. Numerical modelling of the longitudinal changes in flow velocities and water levels along the Rajka-Nagymaros river reach with respect to the peak-power production at the Bős hydropower plant. Graphical interpretation of results.

R.L.

124. Bognár, S. - Rákóczi, L.

Prediction of scour and deposition in a river reach between two intermittently operating hydroelectric power plants.
Part of a book.
In: Proceedings of the International Conference on Fluvial Hydraulics, VITUKI, Budapest, 237-242.
1988.

Prediction of extent and location of scouring and deposition in the main channel of Danube River between the mouth of Bős tailrace canal and Nagymaros by numerical modelling and taking into account the peak-power production of Bős hydropower plant. Graphical representation and interpretation of results.

R.L.

125. Bognár, S.

Estimation of the sediment regime in the Dunakiliti reservoir.
Manuscript, research report in Hungarian,
Budapest, 1-21. Report collection of VITUKI.
1989.

Estimation of silting rate in the reservoir based on the sediment transport characteristics of the affected Danube reach and on previous research results. Characterization of the granulometric composition of bed materials in the reservoir and that of the suspended sediment arriving into it. Distribution of suspended sediment samples along the centerline of river channel within the flow discharge range of 1025-2076 m^3/s.

R.L.

126. Bognár, S.

Morphologic research for the Upper-Danube channel.
Part of a book in Hungarian.
In: Conference of the Hungarian Hydrological Society on the problems of Szigetköz, Győr, 61-72.
1992.

Variability of grain-size distribution of bed materials. Morphological characteristics of Danube bed. Effects of human interventions. Pollutants bound to the bed material grains.

Bases of numerical morphological modelling. Summary of results obtained so far.

R.L.

127. Bognár, S.

Effect of the variant "C" on the water intake of the steam power plant Kelenföld.
Manuscript, research report in Hungarian,
Budapest, 1-8. VITUKI Consult Co.
1993.

Computation of water level drops due to a possible shutdown of the Bős hydroelectric power plant. Worst possible coincidences of Danube discharges at Pozsony and the dammed water levels in the Dunacsúny reservoir. Significance of the discharge conveyed by the Old Danube reach. Fluctuation of results obtained for the gauge cross-section Budapest.

R.L.

128. Bognár, S.

Effects of variant "C" on the water intake of the Nuclear Power Plant Paks.
Manuscript, research report in Hungarian,
Budapest, 1-13. VITUKI Consult Co.
1993.

Computation of characteristic values for the receding water levels at the cross-section Paks in case of shutdown of Bős hydropower plant combined with the totally closed Dunacsúny reservoir and in case of opening one release gate of the latter. Summary of results obtained for four different discharges arrivin at Pozsony, in a tabulated form.

R.L.

129. Csoma, J.

Evaluation of studies concerning the Upper-Danube.
Part of a book.
In: Proceedings on the activity of VITUKI in 1962, in Hungarian, VITUKI Budapest, 172-184.
1965.

Harmful effects of riverbed aggradation. Calculation of bed roughness, discharge and flow velocity for planning the formation of a unified main channel in order to stop bed agrfadation. Construction of a line-series nomograph to facilitate the calculation of bed-load discharge. Estimation of volumes of transported bed load in wet and dry years.

R.L.

130. Csoma, J.

Effect of the Danubian hydroelectric power plant system on the sediment regime.
Part of a book.
In: Proceedings on the activity of VITUKI in 1966, in Hungarian. VITUKI Budapest, 311-329.
1968.

Calculation of bed-load discharge by flow discharge class intervals for the Upper-Danube. Longitudinal variation of sediment deposition in the Dunakiliti reservoir. Volumes of deposition in the reservoir, in the diversion channel and in the Old Danube reach, taking into account the peak-power production by the Bős hydropower plant. Forecast of riverbed changes between Bős and Nagymaros.

R.L.

131. Csoma, J.

Investigations on the ice phenomena of the Bős-Nagymaros hydroelectric power system.
Manuscript, research report in Hungarian Budapest, 1-15. Report collection of VITUKI.
1975.

Examination of the project concerning the series of bottom sills to be built on the abandoned Danube bed between 1816 and 1843 stream kilometers, from the viewpoints of ice phenomena, navigation conditions and the formation of flood levels. Evaluation of bed changes to be expected in case of four different discharges released from the Dunakiliti-Hrusov reservoir.

R.L.

132. Csoma, J. - Kovács, D.

Evaluation of river training activities carried out on the Rajka - Gönyű reach of Danube R.
Periodical in Hungarian.
In: Vízügyi Közlemények, Budapest, 2: 267-291.
1981.

Main concepts of the taining on the Upper-Danube commencen in the sixties, taking into account the requirements of the International Danube Commission. Changes in the mean-flow channel due to the interventions. Bed-forming effects of greater flood waves have passed the reach during the period of time. Drop of low-flow levels due to the bed degradation. Development of bad fords excessively hindering the navigation between 1921 and 1967.

R.L.

133. Csoma, J.

Study of the river channel of Danube downstream of the Nagymaros barrage.
Periodical in Hungarian.
In: Vízügyi Közlemények, Budapest, 2: 286-295.
1987.

Analysis of time series of the annual icefree minimum water stages at stations Nagymaros, Vác, Dunabogdány and Budapest. Comparison of results with the planned downstream water level of the Nagymaros barrage. Changes of discharge rating curves at the mentioned stations before and after 1969. Effect of industrial dredging carried out along this river reach on the water levels. Recommendations for the regular and frequent surveying of the riverbed.

R.L.

134. Deseő, É. - Laczay, I. - Liebe, P. - Rákóczi, L. - Sass, J. - Szekeres, J.

Hydrological and bed-morphological studies on the upper reach of Danube R. and on the arm system of Szigetköz.
Manuscript, research report in Hungarian.
Budapest, 1-27. Report collection of VITUKI.
1992.

Collection of data on the bed changes of the main channel and those of the arms, on the aggradation of floodplain, on the flow regime and carrying out supplementary measurements on the river reach between 1790 and 1851 stream kilometers. Complex hydrological evaluation of the results.

R.L.

135. Károlyi, Z.

Geography of streams of Kisalföld.
Periodical in Hungarian.
In: Földrajzi Közlemények, Budapest, 2: 157-174.
1962.

Description of the first comprehensive training of the Upper-Danube reach. Estimation of annual volume of bed load arriving from the Austrian reach to the Upper-Danube. Longitudinal distribution of depositions. Extent of water level rises due to bed aggradation in the main channel and on the floodplains.

R.L.

136. Kertész, J.

Water supply for the arm system of Szigetköz.
Part of a book in Hungarian.
In: Conference of the Hungarian Hydrological Society on the problems of

Szigetköz, Győr, 73-82.
1992.

General description of the river arm system of Szigetköz. Details of the project for the supplementary water supply of Szigetköz. Expected effects of variant "C" on the water supply of Szigetköz.

R.L.

137. Kovács, D.

Danube Conference in 1977.
Periodical, in Hungarian.
In: Vízügyi Közlemények, Budapest, 1: 125-137.
1978.

Evaluation of river training projects carried out since the sixties on Danube reaches shared by neighbouring countries and on stretshes entirely Hungarian. River training aspects of the Bős-Nagymaros hydroelectric power system. Effects of industrial gravel dredging activity. Possibilities of fulfilment of the long-range navigational requirements.

R.L.

138. Laczay, I.

Peak water levels of the flood wave in 1965 over the floodplain of the Upper-Danube. Effect of flood on riverbed changes.
Periodical, in Hungarian.
In: Vízügyi Közlemények, Budapest, 1: 119-127.
1967.

Reconstruction of peak water levels based on traces left by the flood on the floodplain vegetation. Comparison of results with the relevant data read on the flood gauges along the dikes. Temporary riverbed changes due to loose sediment depositions during the passage of flood. Role of low and medium flows following the flood in restoring the original bed conditions.

R.L.

139. Laczay, I.

Study of effects of the training activities on the Upper-Danube reach.
Manuscript, research report in Hungarian,
Budapest, 1-9. Report collection of VITUKI.
1968.

Partial survey of the river arm system Doborgaz-sziget on the Upper-Danube. Comparison of results with the surveys carried out in 1962. Interpretation of bed changes. Estimation of bed-material rearrangement per 1 m^3 deposition.

Approximative determination of deposition shares originating from the bed-load transport and from the erosion of arm beds.

R.L.

140. Laczay, I.

Study of bed changes in the river arm system Cikola-sziget.
Periodical, in Hungarian.
In: Vízügyi Közlemények, Budapest, 2: 245-255.
1968.

Comparison of survey data from 1903, 1962 and 1967 of the arm system in order to dermine the bed changes Role and extent of bank erosion. Longitudinal distribution of deposition. Correlation between the total amount of bed material had been set in motion in the 1962-1967 period and the resultant aggradation of bed.

R.L.

141. Laczay, I.

Study of the low-flow training effects on the Upper-Danube.
Manuscript, research report in Hungarian.
Budapest, 1-11. Report collection fo VITUKI.
1976.

Bed survey on the experimental river reaches at Rajka, Bős and Nagybajcs. Calculation of river channel volumes related to the water level determined by the International Danube Commission. Comparison of resultant bed changes with the estimated value of annual bed-load volume arriving to the investigated river reach.

R.L.

142. Laczay, I.

Study of the low-flow training effects on the upper-Danube.
Manuscript, research report in Hungarian.
Budapest, 1-12. Report collection of VITUKI.
1977.

New survey of control cross-sections on the experimental river reaches at Rajka, Bős and Nagybajcs. Calculation and interpretation of bed changes occurred between April 1976 and November 1977.
Processing of dredging data referring to the period 1963-1976 and to the river reach between 1790 and 1850 stream kilometers. Comparison of results with the estimated volume of deposited bed load.
Evaluation of bed changes on the Danube reach between Szap and the mouth of Mosoni Danube arm during the period of 1962-1976 based on bed surveys and dredging data.

R.L.

143.Laczay, I.

Study of low-flow training effects on the Upper-Danube.
Manuscript, research report in Hungarian.
Budapest, 1-12. Report collection of VITUKI.
1978.

New bed survey on the experimental river reaches at Rajka, Bős and Nagybajcs. Calculation of river channel volumes and the bed changes occurred since November 1977.

Study of the bed-deforming effect the flood wave in July 1975 on the Upper-Danube reach.

R.L.

144. Laczay, I.

Study of the low-flow training effects on the Upper-Danube.
Manuscript, research report in Hungarian.
Budapest, 1-8. Report collection of VITUKI.
1981.

Bed surveys on the experimental river reaches at Rajka, Bős and Nagybajcs and on the reach 1823-1829 km. Calculation of river channel volumes, determination of the extent of bed changes.

R.L.

145. Laczay, I.

Study of the Old Danube river channel.
Manuscript, research report in Hungarian.
Budapest, 1-7. Report collection of VITUKI.
1985.

Study of Danube reach of about 30 km length downstream of Dunakiliti barrage from the viewpoints of water levels and bed changes, taking into consideration a long-term release of 50-100 m^3/s discharge.

R.L.

146. Laczay, I.

River training, industrial dredging and the bank-filtering water intakes.
Periodical, in Hungarian.
In: Vízügyi Közlemények, Budapest, 3: 376-392.
1987.

Comparison of data from 1970 and 1986 of 25 cross-sections and 175 bed material samples in order to show the effects of river training activities and those of the industrial dredging on bed changes and on the water yield of bank-filtering wells. Comparison of the volume of bed changes and the volumes dredges during 16 years. The slight decrease of bed-

material grain sizes. Combined existence of refining and coarsening of bed materials in the dredged pits.

R.L.

147. Laczay, I.

Effects of river training and industrial dredging on the bed conditions of the Danube reach between Nagymaros and Budapest.
Periodical, in Hungarian.
In: Vízügyi Közlemények, Budapest, 4: 547-567.
1988.

Comparison of cross-sectional and bed material data collected in 1969 and in 1987 in the main channel of Danube between Nagymaros and Budapest and in the Szentendre Danube arm. Effects of the river training carried out between 1937 and 1958 in order to improve navigation. Deposition of fine sediment onto the original gravelly bed. Re-filling of the dredged pits.

R.L.

148. Laczay, I.

Effect of industrial dredging on the riverbed conditions of the Danube reach Komárom-Nagymaros.
Periodical, in Hungarian.
In: Vízügyi Közlemények, Budapest, 3: 387-400.
1989.

Combined effects of the large-scale industrial dredging carried out between 1970 and 1988 and of natural bed degradation on water levels. Role of bedrock outcrops in hindering navigation. Rate of re-filling and characteristics of deposited material in the dredged pits.

R.L.

149. Laczay, I.

Revision of basic data used at the training of Danube River.
Manuscript, research report in Hungarian.
Budapest, 1-17. Report collection of VITUKI.
1990.

Evaluation of variations of the annual low-, medium- and high-flow discharges and/or water levels; characterization of bed-load transport on the Danube reach between Dunaföldvár and the Southern frontier. Correlation of flow and suspended sediment discharges and re-calculation of the annual suspended sediment masses.

R.L.

150. Laczay, I.

Updating of the design flood water levels.
Manuscript, research report in Hungarian.
Budapest, 1-14. Report collection of VITUKI.
1991.

Statistical re-examination of annual maximum icefree water levels for about 90 gauge stations. Evaluation of results and recommendations for the modification or acceptance of the present design water levels. Detailed statistical analysis and evaluation of high-flow time series supplemented by the outstanding maximum value observed in 1991 at Dunaremete.

R.L.

151. Laczay, I.

Preparation for the rehabilitation of the Upper-Danube reach.
Manuscript, research report in Hungarian.
Budapest, 1-36. Report collection of VITUKI.
1991.

Construction and evaluation of geomorphological longitudinal sections. Construction of plans for the river reaches having fords, including their depth contour lines. Consideration of possibilities for channel improvement. Determination of possibilities of a traditional river training project.
Effects of the existence or giving up of the Bős-Nagymaros hydroelectric power system.

R.L.

152. Laczay, I. - Sass, J.

Checking of bed changes on the Paks Danube reach.
Manuscript, research report in Hungarian.
Budapest, 1-15. Report collection of VITUKI.
1992.

Supply of data and informations for assuring the water intake of the nuclear power plant at design low flows. Regular water-level forecasts and control of riverbed changes.

R.L.

153. Liebe, P. - Maginecz, J. - Mayer, I. - Rákóczi, L. - Starosolszky, Ö. - Szepessy, Gy. - Szilágyi, F.

Report on the solution of supplementary water supply of river arms in the Szigetköz concerning the variant "C".
Manuscript, research report in Hungarian.
Budapest, 1-30. Report collection of VITUKI.
1992.

Analysis of advantages and disadvantages and suitability in case of emergency of variants to be considered for assuring 100 m^3/s supplementary discharge. Quantification of main parameters of variants and estimation of their effects.
Connection between the river arms and the Danube. Sediment transport problems. Expected deposition of fine-grain sediment in the arms.

R.L.

154. Major, P.

Study on effects of the Dunakiliti Dam. (in Hungarian)
VITUKI Report I-II.
1976.

B.Á.

155. Marót, Gy.

Forty-nine manuscripts on hydrology and hydraulic engineering, petitions, memorials and studies written for publication in technical papers. (Manuscript) (in Hungarian)
Budapest.
1985-1990.

B.Á.

156. Mayer, I.

River training study project for the Danube reach connected with the removal of the cofferdam at Nagymaros.
Manuscript, research report in Hungarian.
Budapest, 1-90.
1992.

Present status of the 18 km long Danube reach affected by the rehabilitation at Nagymaros-Visegrád and by the removal of the cofferdam. Recommendations for the training of the reach and for the interventions aiming at the re-establishment of its natural dynamic equilibrium.

R.L.

157. Rákóczi, L.

Effect of the Gabcikovo-Nagymaros hydroelectric power system on the sediment regime.
Manuscript, research report in Hungarian.
Budapest, 1-21. Report collection of VITUKI.
1985.

Study of changes in the sediment regime of the Danube reach between Gabcikovo - Nagymaros effected by the runoff conditions altered due to the peak energy production.

Estimation of expected places of sediment deposition and bed scouring, with special aspect to the yield of bank-filtering wells.

R.L.

158. Rákóczi, L.

Prediction of sediment regime of the Dunakiliti reservoir and the Danube reach affected by the Bős-Nagymaros hydropower system.
Manuscript, research report in Hungarian.
Budapest, 1-17. Report collection of VITUKI.
1986.

Revision of former estimations for the filling-up of the Dunakiliti reservoir and elaboration of a new estimation. Changes of the Danube channel within the reservoir.The decreasing trend of sediment transport of Danube River.
Review of Austrian experiences. Recommendations for supplementary data collection.

R.L.

159. Rákóczi, L.

Situation report on the sediment regime of the Danube reach affected by the Bős-Nagymaros hydropower system.
Manuscript, research report in Hungarian.
Budapest, 1-21. Report collection of VITUKI.
1987.

Results of the measurements performed between 1955 and 1985 on the river reach Rajka - Budapest. Characteristics of the examined gauge cross-sections. Characterization of the suspended sediment and bed load transport. Effect of the industrial dredging on the low-flow water levels.

R.L.

160. Rákóczi, L.

Situation report on the sediment regime and bed changes on the Danube reach Rajka-Dunaújváros.
Manuscript, research report in Hungarian.
Budapest, 1-31. Report collection of VITUKI.
1988.

Evaluation of studies carried out so far on the training of the abandoned Danube reach based on the research reports of Csoma and Laczay, on the protocols of the Czechoslovakian-Hungarian Technical Commission and on the relevant parts of the Common Co-ordinated Project of the Gabcikovo-Nagymaros hydroelectric power system. Recommendations for fixing of fords, for the bed-material sampling and for the numerical modelling.

R.L.

161. Rákóczi, L.

Effects of river barrages on the flow and sediment regime.
Periodical, in Hungarian.
In: Vízügyi Közlemények, Budapest, 1: 5-24.
1989.

Variation of water strage - suspended sediment concentration correlations on Danube R. influenced by the Austrian river barrages and by the riverbed degradations. Decrease of the annual amount of bed load arriving from the Austrian Danube stretch. Characteristics of sediment depositions in the Dunakiliti reservoir and in the backwater reach of the Nagymaros barrage, taking into consideration of the peak energy production.

R.L.

162. Rákóczi, L.

Forecasting of bed changes on the Hungarian reach of Danube River.
Part of a book, in German.
In: Bericht, XV, Konferenz der Donauländer über hydrologische Vorhersagen, Varna, Bulgaria 315-324.
1990.

Calculation and graphical presentation of water levels belonging to 1000 m^3/s discharge for the principal gauge stations of Danube between Bratislava and Mohács. Extent of drops of low-flow water levels and their correlation with the industrial dredging. Comparison of bed degradation observed on river reaches not intensively dredged with the extent of degradations on the Austrian reach of Danube demonstrated by Kresser.

R.L.

163. Rákóczi, L.

Flow regime of Danube River and the sediment conditions on the reach Rajka-Gönyű.
Part of a book in Hungarian.
In: Conference of the Hungarian Hydrological Society on problems of Szigetköz, Győr, 33-52.
1992.

Characteristics of the flow regime. Variations of the flow rating curves. Quantitative and qualitative characteristics of the suspended sediment and bed load transport.

R.L.

164. Rákóczi, L.

Suspended sediment and bed load regime of Danube River.
Book in German and Russian.
Regionale Zusammenarbeit der Donauländer, VITUKI, Budapest 1-83.

1993.

This monography written in German and Russian language is a supplementary volume to the monography "The Danube and its basin" published earlier.The sediment transport of the whole river is dealt with based on data measured at 20 stations along the Danube between 1956 and 1985. The data presented in graphs and in tabulated form show clearly the change of sediment transport (in most cases its decrease) during the mentioned time period due to human interventions on the watershed and on the Danube as well as to the climate getting recently drier.

R.L.

165. Rákóczi, L.

Sediment regime of Danube River.
Periodical, in Hungarian.
In: Vízügyi Közlemények, Budapest, 2: 128-149.
1993.

The paper is an abbreviated version of the monography published in the framework of the hydrological co-operation of Danubian countries in German and in Russian languages. Analysis of sediment data time series collected at 20 measuring stations in Hungary and in abroad between 1956 and 1985 in order to demonstrate the effects of human interventions carried out on the watershed, on the Danube and tributaries. The decrease of amounts of water and sediment transported annually also reflects the recent regional climatic changes (getting drier).

R.L.

166. Rákóczi, L. - Szekeres, J.

Situation report on the environmental status of Upper-Danube.
Manuscript, research report in Hungarian.
Budapest, 1-43. Report collection of VITUKI.
1993.

Characterization of water stages, discharges, suspended sediment and bed load discharges and evaluation of their changes based on time series supplemented by the most recent data. Turning from the correlations water stage - suspended sediment concentration to flow discharge - suspended sediment discharge correlations, in order to overcome the difficulties caused by the riverbed changes.

R.L.

167. Regional co-operation of Danubian countries

The Danube and its basin. A hydrographical monography.
Book in German.
Bundesanstalt für Wasserwirtschaft, München, 1-377.
1986.

Physical geographical and water resources characteristics of the Danube basin. Flow regime of the Danube and its main tributaries. Regional water balances. Indispensable basic data for the hydrological study of surface waters in all countries along the Danube River.

R.L.

168. Sibl, J.

Damming the Danube (to what Dam Builders don't want even you to know). A Critique of the Gabcikovo Dam Project (SZOPK = Slovak Rivers Network).
Bratislava (March 1993.)
1993.

B.Á.

169. Szekeres, J.

Hydrological studies at the Rajka section of Danube River.
Manuscript, research report in Hungarian.
Budapest, 1-5., 1-4. (in two parts).
Report collection of VITUKI.
1973 and 1974.

Riverbed surveys, detailed measurements of flow discharges and velocity distributions at the cross-section of the automatic water quality monitoring station near Rajka. Collection and analysis of earlier data for the flow and ice regime. Construction of the flow rating curve of the cross-section Rajka, for the low- and mean-flow range.

R.L.

170. Szekeres, J.

Sediment measurements on Danube River.
Manuscript, research report in Hungarian.
Budapest, 1-5. Report collection of VITUKI.
1989.

Flow- and sediment discharge measurements and bed material samplings on four occasions between Rajka and Vác at 12 selected cross-sections of Danube R. Re-start of bed-load sampling interrupted more than 25 years ago. Processing of results on computer in a directly applicable form.

R.L.

171. Tőry, K.

Training of Danube River.
Book in Hungarian .
Akadémiai Kiadó, Budapest, 1-454.
1952.

Physical geographical description of Danube R. History, reasons and significance of training activities. A monographical review and detailed description of the training works carried out on the Hungarian stretch of Danube R. The data and figures presented in the book form a good base of comparison even today.

R.L.

172. Tőry, K.

Danube River from Rajka to Budapest.
Manuscript in Hungarian.
VITUKI, Budapest 1-15.
1971.

Summary of technical characteristics of the Danube reach mentioned in the title for the designers of the Bős-Nagymaros hydroelectric power system with special regard to the river training project started on the Upper-Danube stretch in the sixties in order to create a unified main river channel.

R.L.

173. Zorkóczy, Z.

Training of the Upper-Danube.
Periodical in Hungarian.
In: Vízügyi Közlemények, Budapest 1: 54-91.
1969.

Review of river training activities from the earliest interventions till 1963. Basic concepts of the training project begun in 1963 and carried out in a co-ordinated way with the Czechoslovakian partner organizations. Progress of the project and results of the control measurements and investigations accomplished till 1967.

R.L.

SOIL SCIENCES

174. Deák, J.

Investigation of environmental isotope content of subsurface water. Bős-Nagymaros Barrage area. (in Hungarian)
VITUKI Library. Manuscript.
1978.

B.Á.

175. Dworak, L. - Kovács, E. - Széles, Gy.

Guidelines for the policy of agricultural production. (in Hungarian)
Növénytermesztési Kutatások, 6. sorozat, 7. füzet, 1-10.
Mosonmagyaróvár.
1947.

The "Guidelines" (demonstrated by 46 thematic maps) give information on the most suitable agro-ecological regions of the main agricultural crops in Hungary. The work was a simplified preliminary version of the later Academy Programme on the "Assessment of the Agroecological Potential of Hungary".

V.GY.

176. Gergelyné, Gál, E. - Németh, T.

Report on the BNV Project: "Changes (transport, abiotic and biotic transformation, leaching) in the plant nutrient regime of soils; and the nutrient load of surface- and subsurface waters. (in Hungarian)
MTA TAKI, Budapest, Manuscript 43 p.
1989.

The report consists of the following main chapters:

* characterization and evaluation of the present plant nutrient status of soils (19 soil profiles) selected for monitoring;
* plant nutrient regime and nutrient balances of agricultural fields, represented by the 19 profiles studied;
* nitrate resources of deeper soil layers and their evaluation from environmental point of view, with particular attention to the hazard of nitrate-pollution of groundwaters.

V.GY.

177. Honti, Gy.

Observation of the groundwater conditions in "Szigetköz". (in Hungarian)
Beszámoló a VITUKI 1954. évi munkájáról. 2: 122-134.
1955.

The relationships between the Danube water level and the groundwater level fluctuations was summarized in the paper. The amplitudes (rates) of groundwater level fluctuations in the "Szigetköz" region was determined and related to the dynamic changes in the Danube water level. The impact

of flood-waves on the depth of groundwater table was shown in figures.

V.GY

178. Karkus, P.

Groundwater data from the Csallóköz. (in Hungarian)
Vízügyi Közl. 3: 282-284.
1953.

B.Á.

179. Katzendorfer, Z.

Explanatory booklet to the agrogeological and practical soil maps of Hungary. (Hédervár, 1:25 000 Nr. 4859/3.) (in Hungarian and in German)
Magyar Királyi Földtani Intézet Kiadás, 1-58.
1943.

Detailed descriptions and characterization of soils in the map-sheet area (alluvial soils, terrace chernozems, sandy soils, organic soils). The possibilities and limitations of crop production. The morphological field description of 76 soil profiles, including the results of simple field soil tests; the results of the laboratory analyses of soils.

V.GY.

180. Láng, I. - Banczerowski, J.-né - Berczik, Á.

"Szigetköz" (island between the main Danube and the Moson Danube). Environmental Studies; state of the environment and the preconditions of its maintenance. Chapter 3. Soils.
MTA, Budapest, 52-62.
1993.

A state-of-the-art review of the soil surveys and soil researches in the "Szigetköz" region, including soil mapping activities; studies on soil forming factors and soil formation processes; mass regime of soils with special attention to moisture regime and the biogeochemical cycle of plant nutrients.

V.GY.

181. Marsi, I. - Síkhegyi, F. - Szurkos, G.

The upperalluvjal sediments of the "Szigetköz" region. (in Hungarian)
Manuscript. MÁFI, Budapest, 1-10.
1991.

The depth, thickness and physical characteristics (stratification, layering, particle-size distribution, compactness, etc.) of the gravelly strata and the finer-textured cover sediments have a significant - sometimes decisive - role in the moisture and mass (substance) regimes of soils in the "Szigetköz" region. The present work consists of a 1:50 000 scale map of

these sediments and the description of their formation, main properties and present development.

V.GY.

182. Miklay, F. - Molnár, L.

Soils of the Moson-plain. (in Hungarian)
Agrokémia és Talajtan, 17: 495-506.
1968.

The authors described and characterized the soils of the plateau (high terrace) between the Moson Danube and the Hanság depression (covered by hydromorphic and peat soils). In their "azonal" development the depth of the groundwater table played a decisive role. The dominant soil types are alluvial soils and meadow chernozems in the Western and Eastern part of the region, respectively. The areas with higher groundwater table are covered by different hydromorphic soils, mainly "meadow soils".

V.GY.

183. MTA TAKI

Potential impacts of the Gabcikovo-Nagymaros, hydropower system on soil resources. I. Report on the 1986 studies for VIZITERV. (in Hungarian)
Manuscript, MTA TAKI, Budapest, 56 p.
1986.

The concept and time-schedule of the soil survey with special regard to the moisture regime of soils and the potential (predictable) impact of the Gabcikovo-Nagymaros System (GNV) on the moisture regime. The description and evaluation of soil forming factors, soil formation processes, and developed soils in the GNV -affected region.
The potential impacts of the existing GNV alternatives on the soil formation, soil moisture regime and biogeochemical cycles and their consequences on land use and soil management.

V.GY.

184. MTA TAKI

Summary of soil investigations within the scope of the scientific cooperation agreement between the Hungarian and Slovakian Academy of Sciences. (in Hungarian)
Manuscript. MTA TAKI, Budapest, 15 p.
1986.

The detailed description of the main soils in the Mosonmagyaróvár region (soil forming factors, soil formation processes; soil and their utilization).

The impact of GNV on the soils in Mosonmagyaróvár region (hydrological conditions, moisture regime, mass transport of soluble compounds), and on their agro-ecological potential.

V.GY.

185. MTA TAKI

Potential impacts of the Gabcikovo-Nagymaros hydropower system on soil resources. II. Report on the 1987 studies for VIZITERV. (in Hungarian)
Manuscript, MTA TAKI, Budapest, 33 p.
1987.

The continuation of the previous studies. In the Bős-Nagymaros Project area the following basic situations can be distinguished or forecasted:

1. The groundwater is and will be standing and fluctuating in the gravel strata.
2. The groundwater is and will be standing and fluctuating in finer-textured sediments.
3. The groundwater is standing and fluctuating at present within finer-textured sediments, but as a direct or indirect consequence of the changes in the hydrology of the Danube-system the groundwater table will sink to the gravel strata.
4. The groundwater is standing and fluctuating at present in the gravel strata, but - as a direct or indirect consequence of hydrological changes in the Danube system - the groundwater table will rise (at least periodically) to fine-textured sediments.

The consequences of the 4 situations on the soil processes, particularly on soil moisture regime are described in the Report. The influencing factors of soil moisture regime from the viewpoint of their stability and sensitivity are analysed. The concept, criteria and parameters of a comprehensive and systematical soil monitoring system for the registration of the regional changes in soil properties under the influence of GNV are described.

V.GY.

186. MTA TAKI

Potential impacts of the Gabcikovo-Nagymaros hydropower system on soil resources. 1987. Summary on the 1986-1987 activities within the scope of the scientific cooperation agreement between the Hungarian and Slovakian Academy of Sciences, in the field of soil sciences. (in Hungarian)
Manuscript, MTA TAKI, Budapest, 13 p.
1987.

Detailed description of the studies. The main potential scenarios of the direct and indirect impacts of the plausible GNV alternatives on soils and their consequences to the soil moisture and substance regimes. The concept and criteria of a comprehensive soil monitoring system for the registration of soil changes. Recommendations for joint actions for the

prevention of undesirable soil processes and for future cooperation.

V.GY.

187. MTA TAKI

Final report on "Soil conditions in the Bős-Nagymaros Project Area with special regard to their moisture- and substance regimes". Summary of studies and obtained results within the Program: "Studies for the development and rehabilitation of the joint Czechoslovakian-Hungarian Danube section". (in Hungarian.)
Manuscript. MTA TAKI, Budapest, 8 p.
1991.

Detailed description of the studies. The main potential scenarios of the direct and indirect impacts of the plausible GNV alternatives on soils and their consequences to the soil moisture and substance regimes. The concept and criteria of a comprehensive soil monitoring system for the registration of soil changes. Recommendations for joint actions for the prevention of undesirable soil processes and for future cooperation.

V.GY.

188. Rónai, A.

Groundwater conditions in the Kisalföld (Small Hungarian Plain). (in Hungarian)
Földrajzi Közlemények, 10: 175-182.
1962.

The author describes and evaluates the factors determining or influencing the groundwater regime (discharge, recharge, horizontal flow, seasonal fluctuation of water table) in the different sub-regions of the "Kisalföld". The specific yield of artesian wells, the average, minimum and maximum depth of the groundwater table are demonstrated on maps. The relationships between the water levels in rivers and the groundwater table are evaluated and information are summarized on the characteristics of groundwater level dynamics and on the chemical composition of groundwaters.

V.GY.

189. Stefanovits, P.

Explanatory booklet to the geological and soil maps of Hungary.
Bős. 1:25 000 Nr. 4859/1. (in Hungarian and in German).
Magyar Kir. Földtani Intézet, 1-58.
1943.

Detailed description and characterization of soils in the map-sheet area. The possibilities and limitations of agricultural production. The morphological field description of 58 soil profiles, including the results of simple soil field tests. The results of laboratory analyses of soils.

V.GY.

190. Szabolcs, I. - Várallyay, Gy. - Miklay, F.

The Transdanubian alkali soils. I. Alkali soils around Győr. (in Hungarian)
Agrokémia és Talajtan, 11: 161-184.
1962.

Based on the detailed analysis of salt-affected soils (salt-affected plots) in the environment of Győr the authors described their formation processes and development. In the poorly drained, deep-lying area the surface- and subsurface waters accumulate the soluble (or transportable) weathering products from a relatively large water catchment area. It leads to salinization/alkalization processes because of the dry climate (negative water balance) and the improper drainage conditions. These processes result in unfavourable changes in the physical-hydrophysical properties of soils (structure destruction, low permeability and hydraulic conductivity) - mainly occurring as water-logging and drought sensitive plots surrounded by non salt-affected soils - limiting their productivity and large-scale agricultural utility.

V.GY.

191. Treitz, P.

Soil map of Magyar-Óvár and its surroundings. (in Hungarian)
Magyar Kir. Földtani Intézet Évkönyve, XI. kötet. 8. füzet, 283-319.
1896.

The concept and methodology of large-scale agro-geological mapping is described in the paper, including the general Legend of agro-geological maps. The physiographical conditions (especially geological and agrogeological conditions) are briefly summarized and the main soil types are described and characterized in details. The booklet contains the soil map of the Demo-farm of the Magyaróvár Agricultural Academy and its surroundings in the scales of 1:25 000, 1:10 000 and 1: 3500, illustrated with the colour profiles of the main soil types; the morphological description of 210 profiles and/or borings; and the results of the laboratory analyses of collected soil samples.

V.GY.

192. Treitz, P.

Soil map of Magyar-Óvár and its surroundings. (in German)
Magyar Kir. Földtani Intézet Évkönyve, XI. kötet. 7 füzet, 311-348.
1898.

The concept and methodology of large-scale agro-geological mapping is described in the paper, including the general Legend of agro-geological maps. The physiographical conditions (especially geological and agrogeological conditions) are briefly summarized and the main soil types are described and characterized in details. The booklet contains the soil map of the Demo-farm of the Magyaróvár Agricultural Academy and its surroundings in the scales of 1:25 000, 1:10 000 and 1: 3500, illustrated with the colour profiles of the main soil types; the morphological

description of 210 profiles and/or borings; and the results of the laboratory analyses of collected soil samples.

V.GY.

193. id. Várallyay, Gy.

Explanatory booklet to the geological and soil maps of Hungary. Moson 4858/4. (in Hungarian and in German)
Magyar Kir. Földtani Intézet Kiadása, 1-58.
1942.

The detailed description of the physiographical conditions (geology, relief, hydrology, weather) soil forming factors and soils in the map-sheet area. The possibilities and limitations of agricultural production. The morphological field description of 410 soil profiles, including the results of simple soil field tests. The results of laboratory analyses of soils.

V.GY.

194. Várallyay, Gy.,

Unsaturated flow studies in layered soil profiles. (in Hungarian)
Agrokémia ás Talajtan, 23: 261-296.
1974.

In the paper a 4-step model is presented for the quantitative characterization of moisture flow from the groundwater to the overlying horizons in the case of layered soil profile and fluctuating groundwater table. Having information (measured, calculated, derivated or estimated data) on the soil moisture profiles and on their temporal changes; on the groundwater fluctuation; and on the unsaturated hydraulic conductivity of the consecutive soil layers the model can be applied for the exact determination of the "optimum depth" of water table (which guarantee the additional water-supply of plants from the good-quality groundwater); or the "critical depth" of the water table (which guarantee the prevention of salt accumulation in the soil profile from saline/alkaline groundwater). On the basis of these calculations maps can be prepared on the "optimum" or "critical" depth of the water table and the necessary preventive measures can be implemented to ensure the supplementary (additional to the atmospheric rainfall) water-supply of plants or to avoid the harmful secondary salinization/alkalization processes, respectively.

V.GY.

195. Várallyay, Gy.

Hydrophysical aspects of salinization from the groundwater.
Agrokémia és Talajtan, 23. Suppl. 29-44.
1974.

Description of a 4-step model for the determination of the "critical depth" of the water table which presents the secondary salinization from the shallow, stagnant, saline groundwater.

The 4 main steps of the model are as follows:

* characterization of the water (or solute) transport in the unsaturated zone (determination of the unsaturated hydraulic conductivity of consecutive layers within the soil profile);
* construction of curve-sets expressing the direction and rate of unsaturated flow in the (homogeneous) soil profile, depending on the soil moisture profile and the depth of water table;
* application of the above-mentioned procedure for stratified (layered) soil profiles;
* application of the above-mentioned procedure for layered soil profiles with fluctuating water table.

With the application of the model - having information (measured, calculated or estimated data) on the actual concentration and chemical composition of the soil solution the "critical depth" or the "critical regime" of the groundwater table can be properly estimated and predicted for various potential situations (scenarios). The critical depth or critical regime can be mapped and these maps can be the exact scientific basis for the elaboration and implementation of efficient technologies for the prevention of unfavourable secondary salinization/alkalization processes.

V.GY.

196. Várallyay, Gy.

Role of groundwater in the soil moisture regime and in the water-supply of plants. (in Hungarian)
Tudomány és Mezőgazdaság, 18: (5) 22-29.
1980.

In the paper a 4-step model is presented for the quantitative characterization of moisture flow from the groundwater to the overlying horizons in the case of layered soil profile and fluctuating groundwater table. Having information (measured, calculated, derivated or estimated data) on the soil moisture profiles and on their temporal changes; on the groundwater fluctuation; and on the unsaturated hydraulic conductivity of the consecutive soil layers the model can be applied for the exact determination of the "optimum depth" of the water table (which guarantee the additional water-supply of plants from the good-quality groundwater); or the "critical depth" of water table (which guarantee the prevention of salt accumulation in the soil profile from saline/alkaline groundwater). On the basis of these calculations maps can be prepared on the "optimum" or "critical" depth of water table and the necessary preventive measures can be implemented to ensure the supplementary (additional to the atmospheric rainfall) water-supply of plants or to avoid the harmful secondary salinization/alkalization processes, respectively.

V.GY.

197. Várallyay, Gy.

Soil water management as a factor on the necessity, possibilities and conditions of irrigation (Contribution to the Round-table Meeting on the

subject of irrigation.)
Acta Agronomica, 30: 87-122.
1980.

In the paper the influences of soil physical-hydrophysical properties on the necessity, conditions and main characteristics of irrigation (maximum and rational quantity of irrigation water, frequency of irrigation, irrigation technology, supplementary agrotechnical measures) are summarized. The potential unfavourable environmental side effects (structure destruction, water-logging, secondary salinization/alkalization, etc.) due to misguided soil and water management are described, as well as possibilities for their prevention, elimination or - at least - reduction (moderation).

V.GY.

198. Várallyay, Gy.

Unfavourable soil moisture regime - limited soil fertility. (in Hungarian)
Agrokémia és Talajtan, 30: 151-161.
1981.

In Hungary most of the limiting factors of soil fertility (multi-functionality of soils in biomass production and environmental protection) and the unfavourable, harmful soil degradation processes are related to (are reasons or consequences of) soil moisture regime. This statement is proved by measured data and validated relationships by the author in this paper. A schematical map is presented on the territorial extension of Hungarian soils with favourable, moderately favourable and unfavourable moisture regimes. Based on the presented data and long-term experiences conclusions are drawn on the possibilities of the improvement of physical-hydrophysical properties of soils and soil moisture regime. The implementation of these measures (technologies) has great practical significance both for biomass production, the maintenance of soil quality (multipurpose functionality) and for environmental protection.

V.GY.

199. Várallyay, Gy.

Soil water management and environment protection. (in Hungarian)
Agrokémia és Talajtan, 32: 438-447.
1983.

The main characteristics of the solid phase of the soil and that of the water supply of plants are briefly summarized and schematically demonstrated in the paper. The category systems - elaborated by the author - for the:
physical-hydrophysical properties of soils;
main types of moisture regime;
main types of mass (substance) regime
are presented for Hungarian soils and interpreted from environmental point of view. Based on their evaluation conclusions are drawn for their control (protection, maintenance, improvement).

V.GY.

200. Várallyay, Gy.

Soil report to the "Landscape and Envrionmental Plan of Mosonmagyaróvár and its environment". (in Hungarian)
Manuscript. MTA TAKI, Budapest, 37.
1983.

Soils in the Mosonmagyaróvár region:

* soil forming factors and soil formation processes (geology, microrelief; humus formation and accumulation, soil structure formation; soil sequences: chrono-sequence, topo-sequence (Catena));
* soils and their agricultural utilization;
* soil map of the region (in the scale of 1:25 000) indicating the following soil characteristics with a 5-digit code: soil type and subtype; $CaCO_3$ content; soil texture, depth of humus horizon; limiting factor of infiltration and root penetration.

The potential impacts of GNV on the soils of the Mosonmagyaróvár region (groundwater conditions; impact on the moisture regime; impact on the substance regime). The potential impacts of GNV on the possibilities and conditions of crop production.

V.GY.

201. Várallyay, Gy.

1:100 000 scale agro-topographical map of Hungary. (in Hungarian)
Agrokémia és Talajtan, 34: 243-248.
1985.

The "Agrotopographical Map of Hungary" was prepared in the scale of 1:100 000 as "overprint" on the new, information-rich topographical map of the country. On the map the following 9 soil characteristics were indicated with contours, using a 10-digit code system: soil type and subtype (altogether 31 categories); parent material (9); soil reaction and carbonate status (5); soil texture (7); hydrophysical properties (9); organic matter resource (6); depth of soil (5); clay mineral associations (10); soil fertility index (10). The meteorological information on the margin of each map sheet (mini-maps and monthly distribution diagrams on the most important climatic factors) make the map a real agrotopographical-agroecological map.

V.GY.

202. Várallyay, Gy.

Fertilizers, liquid manure and drinking-water resources. (in Hungarian)
Egészségtudomány, XXXIV. (2) 126-137.
1990.

The author presented interpreted and evaluated figures on the organic manure and fertilizer application in Hungary from the World War II. The sharp increase of fertilizer application between 1965-1975 was necessary

for the nutrient supply of the intensive, high-yielding crop varieties; for the improvement of the poor nutrient status of Hungarian soils; and for balancing the decreasing quantity of farmyard manure. Later the politically pressed yield increase and the high rate state subsidy on fertilizers lead to overdosage at several places. This overdosage combined with other problems in fertilizer application (improper N-P-K ratio, back of Ca, Mg and micronutrient application, uneven distribution, etc.) result in environmental side effects (P-load of surface waters, nitrate pollution of groundwater resources) at some places. The author analyses in the paper the potential contribution of various sources (liquid manure of overconcentrated livestock farms; drinking water supply without canalization; urban and industrial wastes, waste-waters and sewage sludges; recreation; hobby garden; irrational fertilizer application) in the unfavourable changes in the quality of surface- and subsurface waters and drinking water supplies.

V.GY.

203. Várallyay, Gy.

Soils of the "Szigetköz" region and its environment with special regard to their hydrophysical properties and moisture regime. (in Hungarian)
Acta Ovariensis, 34: 65-73.
1991.

Soil mapping activities in the Szigetköz region

No	Title of the mapping system	Scale	Date	Cartographical basin
1.	OTTK	1:10 000	1957-1959	Cartographical (Gauss-Krüger) map sheets
2.	Géczy practical soil maps	1:25 000	1958-1961	settlements
3.	Genetic soil maps	1:10 000	1960-1970	farming units (state farms, cooperative fams)
4.	Soil map of Győr-Sopron County	1:75 000	1959-1960	Győr-Sopron County
5.	Soil map for the Program of the "Assesment of the agro-ecological potential"	1:100 000	1978-1980	TIEDIT cartographical map sheets
6.	Agrotopographical map	1:100 000	1988-1990	topographical map on EOTR cartographical sheets
7.	Soil of Mosonmagyaróvár and its surroundings	1:25 000	1993	Mosonmagyaróvár and its environment

Soil forming factors and soil formation processes in Szigetköz (chronosequence; topo-sequence: catena).
Moisture regime and mass transport in the soils of Szigetköz (capillary transport of water and solutes; $CaCO_3$-accumulation; etc.) at present and under the potential influences of various forecasted groundwater situations.

V.GY.

204. Várallyay, Gy.

Results of soil investigations in the Szigetköz region. (in Hungarian)
In Pro Aqua "Szigetközi Ankét", Győr, 179-187.
1992.

Soil mapping activities in the Szigetköz region

No	Title of the mapping system	Scale	Date	Cartographical basin
1.	OTTK	1:10 000	1957-1959	Cartographical (Gauss-Krüger) map sheets
2.	Géczy practical soil maps	1:25 000	1958-1961	settlements
3.	Genetic soil maps	1:10 000	1960-1970	farming units (state farms, cooperative fams)
4.	Soil map of Győr-Sopron County	1:75 000	1959-1960	Győr-Sopron County
5.	Soil map for the Program of the "Assesment of the agro-ecological potential"	1:100 000	1978-1980	TIEDIT cartographical map sheets
6.	Agrotopographical map	1:100 000	1988-1990	topographical map on EOTR cartographical sheets
7.	Soil of Mosonmagyaróvár and its surroundings	1:25 000	1993	Mosonmagyaróvár and its environment

Soil forming factors and soil formation processes in Szigetköz (chronosequence; topo-sequence: catena).
Moisture regime and mass transport in the soils of Szigetköz (capillary transport of water and solutes; $CaCO_3$-accumulation; etc.) at present and under the potential influences of various forecasted groundwater situations.

V.GY.

205. Várallyay, Gy.

Main characteristics of soil formation processes in the Hungarian Plain. (in Hungarian)

Hidrológiai Közlöny, 73: (1) 24-27.
1993.

The assessment and evaluation of the main soil forming factors and soil formation processes in the Hungarian Plain (geological conditions, relief, climate and weather; surface and subsurface hydrology, vegetation, land use). Characteristic soil sequences (chrono-sequence; catena, topo-sequence; leaching sequence; salinity-alkalinity sequence) and their combinations as the main reason of the high spatial (vertical and horizontal) and temporal variability of soils.
Control of soil processes as key-task of of sustainable land use, rational and environment-friendly soil management in the Hungarian Plain.

V.GY.

206. Várallyay, Gy.

Soils (Contribution to the "Environment and Ecology" Chapter of the Bős-Nagymaros Project). (in Hungarian and in English)
Manuscript. MTA TAKI, Budapest, 30p + 5 tables + 7 figures + 2 maps.
1993.

Content:

* Soil mapping activities in the Bős-Nagymaros Project Area

No	Title of the mapping system	Scale	Date	Cartographical basin
1.	OTTK	1:10 000	1957-1959	Cartographical (Gauss-Krüger) map sheets
2.	Géczy practical soil maps	1:25 000	1958-1961	settlements
3.	Genetic soil maps	1:10 000	1960-1970	farming units (state farms, cooperative fams)
4.	Soil map of Győr-Sopron County	1:75 000	1959-1960	Győr-Sopron County
5.	Soil map for the Program of the "Assesment of the agro-ecological potential"	1:100 000	1978-1980	TIEDIT cartographical map sheets
6.	Agrotopographical map	1:100 000	1988-1990	topographical map on EOTR cartographical sheets
7.	Soil of Mosonmagyaróvár and its surroundings	1:25 000	1993	Mosonmagyaróvár and its environment

* Soil forming factors and soil formation processes in the Bős-Nagymaros Project Area.

* Soils of the Bős-Nagymaros Project Area (weakly developed humous sandy soils; alluvial soils; alluvial meadow soils; chernozems formed on loess or loess-like materials; terrace chernozems on alluvial material; meadow chernozems; meadow soils; peaty meadow soils; peats).
* Moisture regime of soils.
* Plant nutrient regime of soils.
* Forecasted changes in the moisture- and substance-regimes of soils in the Bős-Nagymaros Project Area (summarized conclusions).
* References (publications, reports and manuscripts).

V.GY.

207. Várallyay, Gy. - Molnár, E.

Changes in the moisture- and substance regimes of soils and in soil fertility under the influence of the Bős-Nagymaros hydropower system. Hungarian-Slovak Seminar, Budapest, May 1989. (in Hungarian)
Manuscript, MTA FKI, Budapest.
1989.

The main potential scenarios of the direct and indirect impacts of the plausible GNV alternatives on soils and their consequences to the soil moisture and substance regimes. The concept and criteria of a comprehensive soil monitoring system for the registration of soil changes. Recommendations for joint actions for the prevention of undesirable soil processes and for future cooperation.

V.GY.

208. Várallyay, Gy. - Rajkai, K.

Model for the estimation of water (and solute) transport from the groundwater to overlying soil horizons. (in Hungarian)
Agrokémia és Talajtan, 38: 641-656.
1989.

In the paper a 4-step model is presented for the quantitative charactrization of moisture flow from the groundwater to the overlying horizons in the case of layered soil profile and fluctuating groundwater table. Having information (measured, calculated, derivated or estimated data) on the soil moisture profiles and on their temporal changes; on the groundwater fluctuation; and on the unsaturated hydraulic conductivity of the consecutive soil layers the model can be applied for the exact determination of the "optimum depth" of water table (which guarantee the additional water-supply of plants from the good-quality groundwater); or the "critical depth" of water table (which guarantee the prevention of salt accumulation in the soil profile from saline/alkaline groundwater). On the basis of these calculations maps can be prepared on the "optimum" or "critical" depth of water table and the necessary preventive measures can be implemented to ensure the supplementary (additional to the atmospheric rainfall) water-supply of plants or to avoid the harmful secondary salinization/alkalization processes, respectively.
The authors presented opportunities for the derivation (calculative estimation) of the unsaturated hydraulic conductivity of soils (which direct

measurement is a time- and work-consuming procedure) on the basis of simple, easily measurable soil physical-hydrophysical parameters (texture, particle-size distribution; bulk density; measured or calculated water retention curve; saturated hydraulic conductivity). Using these "pedotransfer functions" the number of dynamic soil moisture parameters can be considerably increased for their large scale mapping and for their practical applications in the planning and implementation of efficient soil moisture control.

V.GY.

209. Várallyay, Gy. - Szűcs, L. - Murányi, A. - Rajkai, K. - Zilahy, P.

Map of soil factors determining the agro-ecological potential of Hungary, 1: 100 000. I. (in Hungarian)
Agrokémia és Talajtan, 28: 363-384.
1979.

The paper is the description of soil investigations within the National Programme for the "Assessment of the Agro-ecological Potential of Hungary", and the scientific synthesis of their results.

1. Concept, data sources and methodology of the assessment and evaluation of soil resources.
2. Main soil factors determining the agro-ecological potential: soil type and subtype (altogether 31 categories); parent material (9); soil reaction and carbonate status (5); soil texture (7); physical-hydrophysical properties (9); organic matter resource (6); depth of the soil (5).
3. Methodology of the preparation of the 1:100 000 scale map.

V.GY.

210. Várallyay, Gy. - Szűcs, L. - Murányi, A. - Rajkai, K. - Zilahy, P.

Map of soil factors determining the agro-ecological potential of Hungary, 1: 100 000. II. (in Hungarian)
Agrokémia és Talajtan, 29: 35-76.
1980.

Territorial data of the 1:100 000 scale map and their interpretative evaluation.
The territorial distribution of the categories of the distinguished 7 land-site characteristics (a) per administrative regions (19 counties); (b) per agro-ecological regions (36); (c) per soil types.
Tabular summation of contoured soil mapping units and different mapping units. List of possibilities for the multipurpose practical applicability of the map and the database.

V.GY.

211. Várallyay, Gy. - Szűcs, L. - Rajkai, K. - Zilahy, P. - Murányi, A.

Soil water management categories of Hungarian soils and the map of soil water properties 1:100 000. (in Hungarian)

Agrokémia és Talajtan, 29: 77-112.
1980.

In the presented category system of the hydrophysical properties of soils 9 main categories are distinguished according to the following parameters: soil texture; field capacity, wilting percentage, available moisture range (on the basis of measured or derivated water retention (pF/curves); in situ measured infiltration rate; saturated hydraulic conductivity (determined in the laboratory on undisturbed soil cores); other soil characteristics determining or strongly influencing soil moisture characteristics (salinity/alkalinity; pesudogley formation; peat formation; shallow depth). Within the 9 main categories 15 sub-categories are distinguished according to the texture differentiation within the soil profile and the main reason of the unfavourable (extreme) soil moisture regime. In the paper the authors characterize the distinguished categories; present a 1:100 000 scale map as their territorial distribution in Hungary; and summarized their territorial extension per administrative regions (counties); per agro-ecolgical regions; and per soil types.

V.GY.

212. Várallyay, Gy. - Szűcs, L. - Zilahy, P. - Rajkai, K. - Murányi, A.

Soil factors determining the agroecological potential of Hungary.
Agrokémia és Talajtan, 34: Suppl. 90-94.
1985.

The paper is the description of soil investigations within the National Programme for the "Assessment of the Agro-ecological Potential of Hungary", and the scientific synthesis of their results.

1. Concept, data sources and methodology of the assessment and evaluation of soil resources.
2. Main soil factors determining the agro-ecological potential: soil type and subtype (altogether 31 categories); parent material (9); soil reaction and carbonate status (5); soil texture (7); physical-hydrophysical properties (9); organic matter resource (6); depth of the soil (5).
3. Methodology of the preparation of the 1:100 000 scale map.
4. Territorial data of the map and their interpretative evaluation.

V.GY.

213. Várallyay, Gy. - Németh T. - Molnár, E. - Czimber Gy. - Palkovits G.

Soil, agrochemistry and agronomy observations in the "Szigetköz" region. (in Hungarian)
Manuscript, MTA TAKI, 49 p.
1993.

1. Soils in the "Szigetköz" region (soil mapping activities; soil forming factors and soil formation processes; moisture and substance regimes of soil; nutrient regime of soils).
2. Segetal weed vegetation of the "Szigetköz".
3. Agricultural observations in the "Szigetköz" region.

4. Conclusion and recommendations.
5. Bibliography.

V.GY.

214. Várallyay, Gy. - Molnár E. - Palkovits, G. - Szabó, M. - Németh, T.- Halupa, L.

Soil observation in the "Szigetköz" region. (in Hungarian)
Manuscript, MTA TAKI, 56 p + 2 appendix.
1994.

Soils in the "Szigetköz" region (soil forming factors and soil formation processes; soil moisture regime; soil properties; plant nutrient regime of soils).
Changes in the crop production as a consequence of environmental factors (weather, groundwater conditions, soil moisture regime) and their changes, and the applied agrotechnology (land use, cropping pattern, fertilizer application, soil moisture control).
Botanical monitoring.
Forestry monitoring.

V.GY.

ECOSYSTEMS

Terrestrial ecosystems

215. Alexay, Z.

New data on the flora of the Szigetköz. Report. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1987.

New locations of 40 species are presented. Most of them are from the less known Lower Szigetköz.

Sz.M./H.I.

216. Alexay, Z. - Kevey, B.

Alder swamps (Thelypteridi-Alnetum) of the Szigetköz. Report. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1988.

Similarly to willow swamps, this community has lost from its territory because of the deterioration of water supply. This association is characterized by 5 phytosociological relevés describing the remaining 5 stands.

Sz.M./H.I.

217. Alexay, Z. - Kevey, B.

Willow swamps (Calamagrostio-Salicetum cinereae) of the Szigetköz; Rare and protected plants of the oak-ash-elm gallery forests in the Lower Szigetköz. Report. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1989.

This association is characterized by 5 phytosociological relevés describing the few remaining stands. The important species of 10 gallery forest stands are listed. Nature conservational problems of these forests are also discussed.

Sz.M./H.I.

218. Ádám, L. - Marosi, S.

Regional geography of Hungary. Volume 3. Kisalföld and the West-Hungarian border region. (in Hungarian)
Akadémiai Kiadó, Budapest.
1975.

General nature-geographical description of the Kisalföld great region on p. 40-73. Description of the Győr Basin on p. 74-144. Special details on Kisalföld on p. 74-75., p. 98-107., p. 119-120., p. 131-133. Natural flora and fauna inserted into the description of the Győr Basin on p. 128-131. Agroecological potential of the Szigetköz region reviewed on p. 137-139.

In forestry site factors are of fundamental importance from the regional geographical fundamentals.

B.S.

219. Babos, I.- Járó, Z.

Site and stand structure characteristics of the gallery forests in the floodplains affected by the Gabcikovo-Nagymaros Barrage System. Manuscript. (in Hungarian)
Manuscripts, Forestry Research Institute, Budapest.
1976.

The peculiar network of Danube branches provides special mesoclimatic conditions in the Szigetköz. This is the reason for the presence of communities, which are characteristic of higher altitudes. Turkey oak wood (*Quercetum petraeae-cerris*) is the zonal community in most parts of the involved floodplain. Only the NW part can be treated as a transition towards the hornbeam climate. The paper gives an account of the species composition of the canopy layer of these forests.

Sz.M./H.I.

220. Báldi, A. - Kisbenedek, T.

Comparative analysis of edge effect on bird and beetle communities.
Acta Zoologica Hungarica, 40: 1-14.
1994

Effect of edge was studied on bird and beetle communities in an oak forest. Species richness was similar for birds in the edge and interior habitats, but density increased towards the edge. In spite, beetle communities from the edge, inside, and inside-edge differed significantly from each other.

B.A.*

221. Báldi, A. - Moskát, C.

Effect of the edge on the structure of bird communities in Hungarian riparian forests
Proceedings of the 12th International Conference on Bird Atlas and Census Work (in press)
1994

Bird censuses were carried out in poplar and oak forests. Edges harbour more diverse and dense communities, than the interior parts. However, from a nature conservation point of view, the preservation of original structure of various riparian bird communities requires the preservation of interior habitats, that is, large forest patches.

B. A.*

222. Bolla, S.

What will happen to you Szigetköz? (in Hungarian)
Erdészeti Lapok, P. 76-81.
1992.

The article published in the forestry journal referring to the first news on the possible, one-sided diversion of the Danube. It informs professional foresters on the nature-geography, forestry, the state of nature conservation in the Szigetköz region and on the expectable risks and damage in case of a drastic reduction of the main channel's water yield. It gives informations in tabulated form on the range of natural forest associations in the Szigetköz and Csallóköz region dependent on the water levels at Dunaremete.

B.S.

223. Boros, M. - Magyar, E. - Horváth, J.

Ecological objectives and an environmental development proposal for the Hungarian upper Danube region. (in Hungarian)
Budapest 1-91 + 5., 3., 6., 7., sz. melléklet, ÖKO Rt. Manuscript.
1991.

The characteristics of the Danube river-bed, its water- regime, and hidrological assesment of the water bodies. The biota of the Szigetköz. The biota of the areas situated downstream of the Szigetköz. Analysis of problems (water shortage, forest management, pollution). Ecological conditions, proposals for management.

M.F.

224. Boros, M. - Horváth, J. - Magyar, E.

Proposal for ecologically based environmental management of the higher Danube region. (in Hungarian)
Környezetgazdálkodási Intézet, ÖKO Rt., Budapest.
1991.

The article gives an overview on the natural capability, environmental and ecological values of the Szigetköz. Special emphasis is put on living systems such as water-, water dependent- and terrestrial biocoenoses. Their values and threatening factors are described in detail. The botanical part relating the Szigetköz was prepared by Ervin Werner, Zoltán Alexay and Balázs Kevey.

Sz.M./H.I.

225. Boros, M. - Magyar, E. - Horváth, J.

The impact of variant "C" on the terrestrial vegetation. (in Hungarian)
Budapest 1-46, ÖKO Rt. Manuscript.
1992.

The identification of effective factors and estimation of the affected area. The state of the affected area prior to the diversion (flora, fauna). The description and evaluation of processes.

M.F.

226. Bothár, A.

Horizontal Plankton studies on the Danube between Rajka and TurnuSeverin (river km 1850-950). (in German)
Annls Univ. Sci. Budapestinensis.
Sectio Biologica, 16: 157-162.
1974.

100 L samples were taken on the 920 km long section of the Danube, which included three sites (Rajka. Ásványráró and Medve) in the Szigetköz region. Four species were found: *Bosmina longirostris, Macrothrix laticornis, Paracyclops fimbriatus, Acanthocyclops vernalis and copepodids.* The density was very low, probably due to the hydrological conditions of the river. The plankton changes basically after the Danube bend.

F.L.

227. Czimber, Gy.

Segetal weeds of the Szigetköz, ScD Thesis, Manuscript.
Department of Botany, PATE, Mosonmagyaróvár. (in Hungarian)
Manuscripts, Hungarian Academy of Sciences, Budapest. pp, 167.
1992.

The thesis describes the average weed cover of the important agrocultures and the resistant weeds that are important for weed control. Data of the 1990's are compared with those of 20 and 40 years ago. Species are analysed on the basis of their life forms, floristic characters and water requirements. A separate chapter discusses water requirement spectrum of weeds and its possible use in detecting the changes of ecological status in the Szigetköz.

Sz.M./H.I.

228. Czimber, Gy.

Weeds of the extensive carrot fields in the Szigetköz.
Növényvédelem, In press. (in Hungarian)
expected in 1993.

In extensive carrot fields *Reseda lutea* (3.91 %) and *Echinochloa crus-galli* (2.08 %) have the highest cover values. Other important weeds are *Ambrosia elatior, Datura stramonium, Mercurialis annua. Ammi majus* also occurs.

Sz.M./H.I.

229. Czimber, Gy.

Segetal weed vegetation of Nothwestern Hungary III. Weeds of sugar-beet fields in the Szigetköz. (in Hungarian)
Növénytermelés, In press.
expected in 1993.

The article describes the most dominant weed species of sugar-beet fields and the changes in dominance structure in the past decade. Three species described are new for the Szigetköz.

Sz.M./H.I.

230. Czimber, Gy.

Segetal weed vegetation of Nothwestern Hungary II. Weeds of maize fields in the Szigetköz (in Hungarian)
Növénytermelés. In press.
expected in 1993.

The article describes the most dominant weed species of maize fields and the changes in dominance structure in the past four decades. It is shown that the importance of resistant species has increased, whereas that of stoloniferous species has decreased.

Sz.M./H.I.

231. Czimber, Gy.

Segetal weed vegetation of Nothwestern Hungary I. Weeds of wheat fields in the Szigetköz. (in Hungarian)
Növénytermelés. In press.
expected in 1993.

The study of segetal weeds was started in 1990. The aim was to describe the effects of 40-year-long herbicide use on the composition of the weed flora. The article describes the most dominant weed species of wheat fields and the changes in dominance structure in the past four and two decades. The proportion of therophytes in field without herbicides is 86 %, which indicates a strong Mediterranean effect.

Sz.M./H.I.

232. Csiba, L.

Nesting record of Common sandpiper in Hungary.
Aquila, 63-64: 278-279.
1957.

The article gives some data on the nesting of Common sandpiper *(Tringa hypoleucos)* in the Szigetköz.

B.A.

233. Csiba, L.

Supplementary data to Dr. A. Keve's paper: "Data to the Ornis of the Middle-Danube".
Aquila, 65: 302-304.
1958.

This short paper gives distribution and nesting data on 21 bird species from the Szigetköz. Among the rarest species are: Saker Falcon *(Falco cherrug)*, Honey Buzzard *(Pernis apivorus)*, Dunnock *(Prunella modularis)*, Gadwall *(Anas strepera)*.

B.A.

234. Csiba, L.

Occurences of Mute Swans.
Aquila, 69-70, 257
1963.

Occurence of two Mute Swans *(Cygnus olor)* was recorded in 1961, in Cikola-sziget.

B.A.

235. Csiba, L.

White-tailed Sea-eagle in the Szigetköz.
Aquila, 69-70, 258.
1964.

The author found a nesting White-tailed eagle in 1958 in "Körtvényessziget".

B.A.

236. Csiba, L.

Barnacle Goose in the Szigetköz.
Aquila, 71-72, 287.
1965.

In 1962 a Barnacle goose *(Branta leucopsis)* was observed at Dunakiliti.

B.A.

237. Danszky, I.

Directives on and practices of reforestation and afforestation in the various forestry regions in Hungary. Volume 3. Kisalföld forestry region group. No. 50. Szigetköz forestry region. (in Hungarian)
Országos Erdészeti Főigazgatóság, Budapest, p. 143-187.
1963.

The book following a review of the nature-geographical features (geology, climate, terrain and soil conditions, phytogeographical characteristics) of the region and the silvicultural practices applied in the past decribes the regional objectives and technological prescriptions for silviculture based on the typology of Soó, R. and the system of Majer, A. simplified for forestry conditions and adapted to the regional forest types characterized by eight grades of water management. In accordance with the objectives of forestry policy of that time it urged also the conversion of forests of native tree species into stands of domesticated and improved species.

B.S.

238. Dely, O. Gy.

Reptilia. (in Hungarian)
In: Magyarország állatvilága - Fauna Hungariae XX. kötet, 4. füzet, Akadémiai Kiadó, Budapest, pp. 120.
1983.

Description and identification key of the Hungarian reptiles were published. Distribution of them were also reported.

G.A.

239. Directorate of the National Park of Fertő-Hanság

Environmental risks and impacts associated with the Gabcikovo-Nagymaros Project. Summary of the main results of the environmental research activities. (in Hungarian)
Budapest, 1994. p. 19.
1994.

The directorate of the National Park published several papers, official statements and reflections on the standpoint of professional authorities in respect of nature conservation and the state of forests in the Szigetköz region.
All these can be found in the files of the Directorate.

B.S.

240. Fejérváry-Lángh, A. M.

Addenda and corrigenda to the Amphibia part of the Hungarian fauna catalogue.
Fragm. Faun. Hung., 6 (3): 42-58.
1943.

Distribution of amphibians in Carpathian basin was presented by the author and a brief account of History of Hungarian herpetology was also given.

G.A.

241. Felföldy, L.

Hydrobiology for water management 18. Guide to water plants. (in Hungarian)
Aqua Kiadó, Budapest, pp. 145.
1990.

This book describes the methods of collecting and identifying our species, then it gives detailed keys for identifying genera and species. Distribution of each species is given in UTM system map.

Sz.M./H.I.

242. Forró, L. - Gulyás, P.

Eurytemora velox (Lilljeborg, 1853) (Copepoda, Calanoida) in the Szigetköz region of the Danube.
Miscnea zool. Hung. 7: 53-58.
1992.

Eurutemora velox, new to the fauna of Hungary, was found at six localities in the Szigetköz region in June and September 1991. The specimens are briefly described and some relevant locality data are given.

F.L.

243. Frank, C. - Jungbluth, F. - Richnovszky, A.

Molluscs of the Danube from Schwarzwald to the Black Sea. (in German)
Budapest.
1990.

The list of the localities is given of all the recent molluscs found in the Danube and its sidebranches, from the origin of the river to the delta. The work contains localities in the Szigetköz too.

M.G.

244. Fürjes, I.

The genus Aegopinella Lindholm, 1927 in Hungary. (in Hungarian)
Soósiana, 13: 43-54.
1985.

The work enumerates the Hungarian localities of *Aegopinella minor, A. pura, A. ressmanni.* From the Szigetköz only the *A. minor* was mentioned.

M.G.

245. Göcsei, I.

Nature-geography of the Szigetköz region. (in Hungarian)
Akadémiai Kiadó, Budapest, 120 pages.
1979.

This book is up to now the unique, most detailed regional geographical monograph, which is as a whole important in respect of the so called site factors for forestry. It deals with forestry on p. 55-57. in detail and on p. 81-84. in an overview nature.

B.S.

246. Göller, L.

Relationships between man and natural vegetation - a case study from the Szigetköz, Diploma work. (in Hungarian)
Library, Department of Plant Taxonomy & Ecology, L. Eötvös University, Budapest.
1992.

Oak-Ash-Elm gallery forests of the Szigetköz are surveyed. Tree species composition data are collected for each forest stand. The appendix contains a map (1:20 000) used by forest managers.

Sz.M./H.I.

247. Gubányi, A.

Contribution to the knowledge of green frog populations of Szigetköz, Hungary. (in Hungarian)
In: Varga J (Ed.): Trópusi és Szubtrópusi Mezőgazdasági Tanszék Napja, Összefoglaló, Trópusi és Szubtrópusi Mezőgazdasági Tanszék, GATE, Gödöllő, pp. 53-59.
1991.

Serological proporties of green frogs were examined, in order to determine the population structure of water frogs. L-E population systems are suggested by present data, which beside the pool frog consist almost exclusively females of Rana esculenta.

G.A.

248. Gubányi, A.

Distribution of green frogs (Rana esculenta complex, Anura: Ranidae) in Hungary. (in Hungarian)
In: Korsós, Z. & Kiss, I. (eds) Proc. Sixth Ord. Gen. Meet. S.E.H., Budapest, pp. 205-210.
1992.

Population structure of water fogs were examined from 8 localities in Hungary. One of them was Cikolasziget, situated in the flood of the River Danube. Samples collected in Cikolasziget showed a female excess for Rana esculenta and Rana lessonae. The ratio of male Rana esculenta among the frogs was 2 %. The sample also contained 5 % Rana ridibunda specimens among 61 frogs.

G.A.

249. Gubányi, A. - Creemers, R. C. M.

Reproduction sites of Amphibians in a floodplain of the river Danube (Szigetköz) in Hungary. (in Hungarian)
Program and Abstracts of 7th Ordinary General Meeting of Societas Europea Herpetologica, pp. 75.
1993.

The study was based on the field observations of green frogs between the period 1988-1992 and was extended in 1993 for mapping the aquatic phase of all amphibians. The following 11 species colonized this region: *Triturus vulgaris, Triturus cristatus, Bombina bombina, Pelobates fuscus, Bufo bufo, Bufo viridis, Hyla arborea, Rana arvalis, Rana lessonae, Rana ridibunda, Rana esculenta.*

G.A.

250. Halupa, L.

Effects of the Bős-Nagymaros Barrage System on the ecological conditions of the forests in the Szigetköz. Manuscript. (in Hungarian)
Manuscripts, Forestry Research Institute, Budapest.
1985.

The existence of planted woods in the Szigetköz is ensured by prevailing soil hydrological conditions. The authors determined water requirements of sylviculture and the necessary hydrological conditions. According to their calculations productivity of commercial forests would decline to one third of present potential if the level of groundwater decreased by 2 m.

Sz.M./H.I.

251. Halupa, L.

Present state of the gallery forests in the floodplains affected by the Gabcsikovo-Nagymaros Barrage System, and their changes during the past 30 years. Manuscript. (in Hungarian)
Manuscripts, Forestry Research Institute, Budapest.
1987.

The natural community (willow-poplar gallery forest) of the low-floodplain has almost disappeared during the studied period. Its relic small stands are predominantly of coppice origin. About 70 % of the original forests is covered by stands of Euro-American poplar hybrids. However, the herb layer of these stands has preserved the original site indicator species.

Sz.M./H.I.

252. Halupa, L.

Development and results of the Danube monitoring network. (in Hungarian)
Magyar Hidrológiai Társaság, Szigetközi Ankét, Győr, Pro Aqua, 189-209.
1992.

The development of the forestry aspects of the Danube monitoring network was started by the Forestry Research Institute (ERTI) in 1986. It has been connected to the monitoring studies of other scientists (botanists, zoologists, soil scientists). These studies have been aimed at determining the exact relationships between site characteristics and forest stand types. In order to avoid deterioration of site properties, it is necessary to provide the original water level.

Sz.M./H.I.

253. Halupa, L. - Járó, Z.

Ecology of the forests of the Szigetköz floodplain. Manuscript. (in Hungarian)
Manuscripts, Forestry Research Institute, Budapest.
1985.

Productivity of low-floodplain forests is determined by three factors, mesoclimate, hydrological conditions and soil properties. Survival and wood production of the plantations (mainly poplar cultivars), that were planted as substitution for the natural willow-poplar gallery forests, are controlled by these factors.

Sz.M./H.I.

254. Halupa, L. - Járó, Z.

Ecology of the forests in the inundation area of the Szigetköz region. (in Hungarian)
In: Ecology of the Danube's reach in the Szigetköz region, p. 192-214.
MTA Veszprémi Akadémiai Bizottság Kiadványa.
1987.

Following the description of the Danube's water movements in the Szigetköz region and the hydrological, climatic and site conditions in the inundation area the publication reviews briefly the forest associations (both the stands of native and domesticated or improved tree species) in the inundation area of the Old Danube, furthermore the characteristics of forestry (expansion, growing stock and increment per hectare, presumable market-value production). It considers hybrid poplar stands in ecological sense equivalent to the former native soft or hard broadleaved groves, and their production in market value several times higher than the latter ones. In this region are to be found the highest yield producing and most valueable stands of the country. Further expansion of hybrid poplar and hybrid willow stands in considered as desirable.

B.S.

255. Horánszky, A. - Jakucs, P. - Láng, E. - Simon, T.

Ecological problems of the Gabcikovo-Nagymaros and the Tisza II. barrage systems. (in Hungarian)
MTA Biol. Oszt. Közlem. Bp. 22: 407-415.
1979.

Potential vegetation of the involved area is assessed and mapped on the basis of known successional trends and estimated changes in groundwater and water levels. Expected changes of vegetation are also described.

Sz.M./H.I.

256. Horváth, Gy. J.

The distribution of Caloptilia roscipennella Hbn. in the Little Plain in Northwestern Hungary (Lepidoptera). (in Hungarian)
Folia ent. hung. 42. 34. 1: 238.
1981.

The distribution data of *Caloptilia roscipennella* in the Szigetköz and in Hungary with some notes on the bionomics of the species (rearing, collecting of mines) are given. The collecting localities in the Szigetköz area are illustrated in a map.

R.L.*

257. Horváth, Gy. J.

Clepsis consimilana (Hübner, 1817), new to the fauna of Hungary (Lepidoptera: Tortricidae). (in Hungarian)
Folia ent. hung. 54: 169-170.
1993.

The diagnosis - external and genital morphology, with the figure of the male genitalia -, and the general distribution of *Clepsis consimilana*, with special regards to its occurrence and phenological data in the Szigetköz area are given.

R.L.*

258. Horváth, Gy. J.

Data to the knowledge of the Lepidopterous fauna of Szigetköz. (in Hungarian)
Folia ent. hung. 54: 170-185.
1993.

This is the only published synopsis on the lepidopterous fauna of the Szigetköz area after the catalogue of the Hungarian *Macrolepidoptera* (Kovács, 1953-56).
It contains locality data of more than 800 *Lepidoptera* species, some of the species of faunistical interest are characterized in details. A highly important work.

R.L.*

259. Láng, I. - Banczerowski, J.-né. - Berczik, Á. (editors)

Szigetköz. Environmental researches. Environmental status, ecological

directives. (in Hungarian)
Hungarian Academy of Sciences. Budapest. pp., 145.
1993.

The 36 authors of the volume discuss the formation and present features of the Szigetköz. The results of scientific and economic researches done up till now are also summarized. Outlines of future research tasks are given. Because of the diverse fields covered, this volume is the most important work that have appeared by now about the environmental conditions of the Szigetköz.

Sz.M./H.I.

260. Kálóczy, L.

Mute Swan on the Moson-arm of the Danube.
Aquila, 69-70, 257
1963.

A juvenile Mute Swan *(Cygnus olor)* was observed on the Little-Danube, near Mecsér in 1962.

B.A.

261. Kárpáti, I.

Gallery forests of the River Danube in Hungary, PhD. Thesis. (in Hungarian)
Manuscripts, Hungarian Academy of Sciences, Budapest.
1957.

The gallery forests of the River Danube are characterized by several synthesized phytosociological tables. From the Szigetköz the following communities are included, *Calamagrosti-Salicetum cinereae, Thelipteridi-Alnetum, Salicetum purpureae, Salicetum triandrae.*

Sz.M./H.I.

262. Kárpáti, I.

Synecological and production biological characteristics of floodplain terraces and waters in Hungary. DSc Thesis. (in Hungarian)
Manuscripts, Hungarian Academy of Sciences, Budapest.
1973.

Phytosociological description of river and river bank communities is given together with the results of production studies that were carried out at certain locations.

Sz.M./H.I.

263. Keve, A.

The Ornis of the Middle-Danube.

Akadémia Kiadó, Budapest, 1-127.
Studia Biologica Hungarica, 7.
1969.

The study is dealing with the avifauna of the Hungarian section of Danube valley in eco-faunistical aspects. The data of this study concerns the Szigetköz area to a lesser extent.

B.A.

264. Kevey, B.

Data on the flora and vegetation of Hungary II. (in Hungarian)
Bot. Közlem. 70: 19-23.
1983.

Floristic data of 40 species are included. Three of them *(Equisetum hyemale, Ribes rubrum és Carpinus betulus)* are related to the Szigetköz. The occurrence of *Anemone nemorosa* near Mosonmagyaróvár was registered by mistake instead of *A. sylvestris* (later personal communication).

Sz.M./H.I.

265. Kevey, B.

Data on the flora and vegetation of Hungary III. (in Hungarian)
Bot. Közlem. 72: 155-158.
1985.

This continuation of Kevey (1983) reports new distributional data of 5 species *(Cerasus avium, Carpesium cernuum, Fraxinus excelsior, Neottia nidus-avis, Tilia cordata)* in the Szigetköz.

Sz.M./H.I.

266. Kevey, B.

Phytosociological characteristics of the oak-hornbeam forests in the Szigetköz, and expected successional effects of landscape changing activities. Competition essay. (in Hungarian)
Hungarian Academy of Sciences, Veszprém. VEAB Pályamunka.
1984.

This rare community of the Szigetköz and its types are characterized by 15 phytosociological relevés. Problems of water regime, causing harmful drying of these forests, are discussed. These problems will cause a shift towards a more xeric forest type.

Sz.M./H.I.

267. Kevey, B.

Proposal for founding the Szigetköz Landscape Protection Area,

Manuscript. (in Hungarian)
Directorate, Fertő National Park, Sopron.
1986.

In the first place the gallery forest along the Moson-Danube and the Cikola stagnant Danube branch are proposed for protection. They not only represent the original communities of the floodplain, but they have also preserved some protected and/or locally rare species. Their locations are listed.

Sz.M./H.I.

268. Kevey, B.

Oak-hornbeam forests (Querco robori-Carpinetum) of the Szigetköz. Report on the botanical researches of the Szigetköz in 1987. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1987.

This characteristic community of higher floodplains in the Szigetköz is characterized by 15 phytosociological relevés. Nowadays it is restricted to only small fragments. The list of valuable plant species, occurring within these stands, is also presented. Some of them are characteristic of montane or submontane regions.

Sz.M./H.I.

269. Kevey, B.

Oak-Ash-Elm gallery forests. (Fraxino [pannonicae] -Ulmetum) of the Szigetköz. Manuscript. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1987.

The once widespread forest community of the higher floodplain characterized by 20 phytosociological relevés. Characteristic gallery forest herbs are listed.

Sz.M./H.I.

270. Kevey, B.

Forest types of the Oak-Ash-Elm gallery forests of the Szigetköz. Report. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1988.

Ten different types of seminatural, presently *Fraxinus excelsior*-dominated gallery forests are distinguished. Typification is mainly based on the dominants of the herb layer, which are called facies-forming species.

Sz.M./H.I.

271. Kevey, B.

Data on the flora of the Szigetköz. Report. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1988.

The author presents floristic data of 19 plant species. Most of these records are new to the Szigetköz.

Sz.M./H.I.

272. Kevey, B.

Data on the flora and vegetation of Hungary IV. (in Hungarian)
Bot. Közlem. 74-75: 93-100.
1988.

New distributional data of 41 species are listed. Four species *(Actaea spicata, Ribes rubrum, Vitis sylvestris és Carex alba)* are described from the Szigetköz.

Sz.M./H.I.

273. Kevey, B.

Oak-Ash-Elm gallery forests of the upper Szigetköz. Report. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1989.

This relatively intact extensive community of higher floodplains is characterized by 50 phytosociological relevés. Exact location, level of degradation and the list of valuable and protected plant species are given for each stand.

Sz.M./H.I.

274. Kevey, B.

Oak-Ash-Elm gallery forests of the mid Szigetköz. Report. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1989.

This once typical community is characterized by 50 phytosociological relevés.

Sz.M./H.I.

275. Kevey, B.

Data on the flora and vegetation of Hungary V. (in Hungarian)
Bot. Közlem. 76: (1-2) 83-96.
1989.

New distributional data of 79 species are listed. Fifteen species are new to the Szigetköz, of which 6 are protected *(Ophrys insectifera, O. apifera, Cephalanthera longifolia, Epipactis microphylla, Pyrola rotundifolia és Vitis sylvestris)*.

Sz.M./H.I.

276. Kevey, B.

Synopsis of the forest communities of the Szigetköz. (in Hungarian)
In, Report on the botanical researches of the Szigetköz, 1990.
PATE Mosonmagyaróvár; OTvH Budapest.
1990.

A comprehensive description of 9 forest communities (both willow-poplar and oak-ash-elm gallery forests) of the Szigetköz is given. Coenological characteristics, dominant species and rare or protected species are discussed in detail.

Sz.M./H.I.

277. Kevey, B.

Oak-Ash-Elm gallery forests of the lower Szigetköz. Report. (in Hungarian)
PATE Mosonmagyaróvár; OTvH Budapest.
1990.

Fifty phytosociological relevés are used for characterizing the forest communities of the region.

Sz.M./H.I.

278. Kevey, B.

Ecological appraisal of the Szigetköz, Manuscript. (in Hungarian)
ÖKO Rt. Budapest.
also In, Proposal for ecologically based environmental management of the higher Danube region Környezetgazdálkodási Intézet and ÖKO Rt. Budapest.
1991.

The forests of the Szigetköz are assessed by criteria of nature conservation. Different code numbers, expressing special aspects (landscape-, individual botanical-values, level of naturalness and degradation) of nature conservation are used for this assessment. A map is also enclosed.

Sz.M./H.I.

279. Kevey, B.

Report on the botanical researches of the Szigetköz, 1992. (in Hungarian)
Sopron Directorate, Fertő National Park.
1992.

The report presents the results of the survey of forests in the neighbourhood of Ásványráró, Bezenye és Darnózseli. Protected species are listed together with abundance estimates for each stand.

Sz.M./H.I.

280. Kevey, B.

Data on the flora and vegetation of Hungary VI. (in Hungarian)
Bot. Közlem. (in press)
expected in 1993.

New distributional data of 83 species are listed. Seventeen species are described from the Szigetköz, of which 5 are protected.

Sz.M./H.I.

281. Kevey, B.- Alexay, Z.

Alder swamps (Carici acutiformis-Alnetum) of the Szigetköz. Protected plants of the Szigetköz. (in Hungarian)
Report.
PATE Mosonmagyaróvár; OTvH Budapest.
1990.

Five phytosociological relevés are presented for characterizing this rare community, which is one of the most threatened one by drying out.
Distributional data of 56 protected species in the Szigetköz are given.
The 3 most important factors (forestry, agriculture, water management) causing conservational problems in the Szigetköz are discussed. The authors propose changes in the borderlines of the landscape protection area. They also suggest that some forest stands should be included in the forest reserve program.

Sz.M./H.I.

282. Kevey, B. - Alexay, Z.

Data on the flora of the Szigetköz.
Acta Ovariensis 34: (1) 29-37.
1992.

The locations of 61 species, including 26 protected species, are given. Out of the 61 species 1, 2 and 15 were newly found in the Eupannonicum, in the Arrabonicum and in the Szigetköz, respectively. Important new occurrences of 14 species that had been recorded in the last century were also found.

Sz.M./H.I.

283. Kevey, B.- Czimber, Gy.

Phytogeographic role of Allium ursinum in the Szigetköz. (in Hungarian)
ATEK Mosonmagyaróvári Mezőgazdaságtud. Kar Közlem. 24: 262-287.

1982.

Oak-Ash-Elm gallery forests are characterized and assessed by analysing 20 coenological relevés. Distributional data and site description for *Allium ursinum* are given together with the distribution of communities *(Fraxino [pannonicae]-Ulmetum* és *Querco robori-Carpinetum*) in which *Allium ursinum* occurs in the Szigetköz. It was shown that these stands are restricted to a 100 m wide band along the Moson-Danube branch, mostly in western Szigetköz.

Sz.M./H.I.

284. Kevey, B.- Czimber, Gy.

Connection between the vegetation of the "Május 1-liget" in Mosonmagyaróvár and that of the Szigetköz. (in Hungarian)
ATEK Mosonmagyaróvári Mezőgazdaságtud. Kar Közlem. 26: 235-255.
1984.

Oak-Ash-Elm gallery forests of the Szigetköz are compared with the wood of the university park by analysing 20-20 phytosociological relevés. For the latter the published tables contain accurate floristic data.

Sz.M./H.I.

285. Kovács, L.

The Hungarian Macroheterocerans and their distribution. (in German)
Folia ent. hung. 6: 76-164.
1953.

A fundamental work on the *Macrolepidoptera* fauna of Hungary, revising and summarizing all known distribution data of the macro-moths ever recorded from Hungary. It contains a considerable amount of locality data from the Szigetköz area, especially from the vicinity of Mosonmagyaróvár and Győr.

R.L.*

286. Kovács, L.

The Hungarian Macroheterocerans and their distribution. II. (in German)
Folia ent. hung. 9: 89-140.
1956.

The second part of the catalogue of the Hungarian *Macrolepidoptera*, containing only a few new locality data from the Szigetköz area.

R.L.*

287. Magyar Természettudományi Múzeum Állattára

Terrestrial zoological assessment of the Szigetköz Danube-reach of the Hungarian part. (1991-1992) (A brief summary) (in Hungarian)

Budapest 1-18, MTM Állattára. Manuscript.
1992.

The summary of results of the studied animal taxa, in English and Hungarian.

M.F.

288. Mahunka, S. - Mészáros, F. - Ronkay, L. - Simon, T. (red.)

The synopsis of the conservation values of the Szigetköz Danube section. (in Hungarian)
Budapest 1-86, MTM Állattár, KTM, Fertő-tavi NP Igazgatósága. Manuscript.
1993.

The natural values of the different habitats of the Szigetköz (fauna, flora, plant associations). The most important areas and the expected changes. The effects of version "C" on the fauna in the different habitat types.

M.F.

289. Matskási, I. - Mészáros, F. - Murai, É. - Dudich, A.

On the parasite fauna of Microtus oeconomus Palls, 1776 ssp. mehely Ehik, 1928 in Hungary
Miscnea zool. hung. 7: 9-14
1992.

List of parasite fauna of *Microtus oeconomus* found in Hungary. The localization of parasites in the living organisms is given as well.

Cs.G.

290. Mészáros, F. - Báldi, A. (red.)

The botanical and zoological assessment of the planned Fető-Hanság-Szigetköz National Park and its recommended zonation. I. Szigetköz. (in Hungarian)
Budapest, Fertő-tavi NP Igazgatósága, Sarród. Manuscript.
1992.

The areas recomended for protection, botanical and faunistical description of the region. Plant association tables, list of known animal species.

M.F.

291. Mészáros, F. (red.)

The biological monitoring system of the Szigetköz (Zoological Monitoring). The summary of the results of 1993. (in Hungarian)
Budapest 1-56, MTM Állattára, Manuscript.
1993.

The tendencies of changes caused by the diversion of the Danube. The effects on the fauna of the Szigetköz in 1993.

M.F.

292. Mészáros, F. (red.)

Zoological assessment of the Szigetköz Danube-reach of the Hungarian part. Summary of the results of 1991-1992. (in Hungarian)
Budapest 1-81, MTM Állattára, MTA. Manuscript.
1992.

Gives a list and short description of species occuring in the Szigetköz in taxonomical order.

M.F.

293. Mészáros, F. - Bankovics, A. (red.)

The results of ecological research in the Szigetköz. (in Hungarian)
Budapest 1-28, MTM Állattára, MTA. Manuscript.
1993.

A short summary of the research results. The characterization of protectable areas.

M.F.

294. Mészáros, F. - Ronkay, L. - Vojnits, A. (red.)

The Nature Protection Aspects of the Gabcikovo-Nagymaros Project. (in Hungarian)
Budapest 141-167, MTM Állattára, KTM. Manuscript.
1994.

The general description of the flora and fauna of the area affected by the planned construction prior to the diversion. The effect of version "C" on the biota.

M.F.

295. Moskát, C. - Báldi, A. - Waliczky, Z.

Habitat selection of breeding and migrating icterine warblers Hippolias icterina: a multivariate study
Ecography 16: 137-142.
1993

The habitat selection of migrating and breeding populations of the icterine warblers was studied. Vegetation samples were taken from sites where individuals were seen, and this data set was compared by multivariate techniques with vegetation of randomly chosen sites.

We detected different site preference of the migrating and breeding populations.

B.A.*

296. Nagy, I.

Great White-egret in the environs of Győr.
Aquila, 67-68, 204.
1961.

The article is dealing with the Great White-egret *(Egretta alba)* occuring in increasing number arround Győr in the 1950s.

B.A.

297. Nagy, I.

Barnacle Goose in the Szigetköz.
Aquila, 71-72, 226-227.
1965.

One Barnacle Goose was observed in the Szigetköz, between Máriakálnok and Arak in 1964.

B.A.

298. Nagy, I.

Pygmy Cormorant in the Szigetköz.
Aquila, 71-72, 226.
1965.

Two pairs of Pygmy cormorants were observed on the Little-Danube, between Mosonmagyaróvár and Feketeerdő.

B.A.

299. Nagy, I.

The effect of the winter of 1962-63 on the avifauna of Szigetköz and its countryside.
Aquila, 71-72, 228-229
1965.

During the extraordinary cold winter in 1962-63 exceptionally great number of birds concentrated along the Danube and its sidebranches in the Szigetköz. Several species were observed, such as: Barnacle Goose *(Branta leucopsis)*, Black-throated Diver *(Gavia arctica)*.
Bean Goose *(Anser fabalis)*, Snow Bunting *(Plectrophenax nivalis)*, Woodcock *(Scolopax rusticola)*, White-fronted Goose *(Anser albifrons)*, etc.

B.A.

300. Ottó, L.

Letter to the editor: The molluscs of the hot springs in Lipót. (in Hungarian)
Soósiana, 8: 9-10.
1980.

The discovery of the introduced exotic *Eobania vermiculata* in Hungary and the occurence of other snails around the Lipót spa is documented.

M.G.

301. Pintér I.

The molluscs of Győr-Sopron county: evaluation of researches conducted so far.
Soósiana, 8: 35-44.
1980.

A list of molluscs and their localities in the Győr-Sopron county, with UTM maps. The enumeration is performed in the systematic order of the species.

M.G.

302. Pintér, L.

Paladilhia oshanovae n. sp. (Gastropoda, Prosobranchia).
Malakol. Abh. Mus. Tierkunde, Dresden 2, 157-158
1968.

A description is given of a recent, new *Hydrobiid*-species from the bank deposit of the Danube.

M.G.

303. Pintér, L. - Richnovszky, A. - Szigethy, A.

Distribution of recent Hungarian Mollusca. (in Hungarian)
Soósiana, Suppl.1. pp 351.
1979.

A list of mollusc species and their localities on Universal Transversal Mercator maps of Hungary, containing data of Szigetköz, too.

M.G.

304. Pintér, L. - Szigethy, A.

The distribution of recent Mollusca of Hungary: new records and corrections II. (in German)
Soósiana, 8: 65-80.
1980.

The revised data of Hungarian molluscs with several localities from the Szigetköz.

M.G.

305. Polgár, S.

Flora of Győr County. (in Hungarian)
Bot. Közlem. 38: 201-352.
1941.

A detailed description of the flora of those parts of the Szigetköz that belong to Győr County is given. In addition to vascular plants the occurrences of fungi, mosses and lichens are also given together with quantitative characteristics.

Sz.M./H.I.

306. Révy, D.

Contributions to the knowledge of the Coleoptera fauna of Moson Country. (in German)
Folia ent. hung., 8: 47-57.
1943.

Locality data of *Caraboidea* from Cikolasziget, Dunaremete, Feketeerdő and Máriakálnok.

M.O.

307. Révy, D. - Siroki, Z.

Contributions to the knowledge of the Coleoptera fauna of Moson County. I. Anthribidae, Curculionidae and Scolytidae. (in German)
Folia ent. hung., 7: 73-84.
1942.

Locality data of *Curculionoidea* from Cikolasziget, Feketeerdő and Máriakálnok.

M. O.

308. Richnovszky, A.

Data to the mollusca fauna of the flood area of the Danube.
Opusc. zool. Budapest, 7: 195-205.
1967.

The characteristic molluscs of the floodplains of the Danube and their short descriptions.

M.G.

309. Richnovszky, A.

Systematics and ecology of the mollusc fauna of the Hungarian Danube section. (in Hungarian)
Kandidátusi értekezés, Bajai Tanárképző Főiskola, Baja, pp 300.
1977.

The molluscs of the Danube river and its flood plains. Descriptions of their habitats, and maps of their distribution.

M.G.

310. Richnovszky, A.

On the mollusc fauna of the Hungarian Danube section. (in Hungarian)
Hidrol. Tájékoztató, 2: 86-88.
1975.

Enumeration of snails and bivalves in the Danube and its surroundings, found till 1975. Short descriptions of the characteristic forms and the main habitats.

M.G.

311. Simon, T.

Study of biological equilibrium in relation to the establishment of the Gabcikovo-Nagymaros Barrage System. Manuscript. (in Hungarian)
Library, Department of Plant Taxonomy & Ecology, L. Eötvös University, Budapest.
1978.

The potential vegetation along the affected parts of the Danube is described together with the scheme of mineralogenic and organogenic succession. Contemporary state of the vegetation of the different terraces is surveyed. Predictions on possible effects caused by putting the system into operation are given by estimating the effects of changes in soil hydrological status.

Sz.M./H.I.

312. Simon, T.

Guide to the Hungarian vascular flora Pteridophytes - Flowering plants. (in Hungarian)
Tankönyvkiadó, Budapest, pp. 892.
1992.

It is based on current taxonomic knowledge, its Latin and Hungarian nomenclature can be regarded as a standard. In addition to the identification keys for the included taxa, it also contains the evaluation of the naturalness of communities. The species are also described in terms of the following characteristics, geographical distribution type,

phytosociological character, life form, ecological indicator values (TWR), nature conservational value. The latest data on the Hungarian distribution of each taxa are given including those related to the Szigetköz.

Sz.M./H.I.

313. Simon, T.

Plant communities of the Szigetköz and their naturalness. (in Hungarian)
Természetvédelmi Közlemények, In press.
expected in 1993.

The author lists the 67 communities known from the Szigetköz and groups them into 12 association classes. The distribution, phytogeographical character and nature conservational rank of the communities are also given. The latter is analyzed in detail, 64 % of the communities indicates close to natural state. This value is 72 % within the landscape protection area.

Sz.M./H.I.

314. Simon, T.- Horánszky, A.- Kovács-Láng, E.

Potentielle Vegetationskarte der Donau-Strecke Zwischen Rajka und Nagymaros.
Bp. Acta Bot. Hungarian Academy of Sciences. 26: 191-200.
1980.

The natural vegetation of the whole Danube floodplain is described. A map (scale 1,100 000) of potential vegetation is also given. Expected vegetational changes caused by increase and decrease of groundwater are outlined.

Sz.M./H.I.

315. Simon, T. - Sasvári, L.

Botanical and ornithological surveys in the Szigetköz. (in Hungarian)
Magyar Hidrológiai Társaság, Szigetközi Ankét, Győr. Pro Aqua, 221-231.
1992.

The vegetation is assessed by species composition, water requirement and the level of naturalness and degradation, using the database collected during the five-year monitoring between 1987 and 1991. Level of degradation ranges from 10 to 40 % within the surveyed area. Changes in plants' water requirement indicator value spectra and leaf area indicate the decrease in water supply of the habitats.

Sz.M./H.I.

316. Simon, T. - Szabó, M. - Hahn, I. - Draskovits, R. - Gergely, A.

Survey on the flora and communities in the Szigetköz I. Phytosociological status and nature conservational assessment of willow woods. Report. (in

Hungarian)
Library, Department of Plant Taxonomy & Ecology, L. Eötvös University, Budapest.
1991.

Different stands of willow woods and willow-poplar gallery forest were described by 12 and 23 phytosociological relevés respectively. Synthetic tables were constructed from the data. Samples were collected along the main riverbed, the branch-system and the Mosoni Danube. A smaller proportion of stands indicates seminatural state, whereas a higher proportion shows signs of degradation.

Sz.M./H.I.

317. Simon, T. - Szabó, M. - Hahn, I. - Draskovits, R. - Gergely, A.

Survey on the flora and communities in the Szigetköz II. Phytosociological status and nature conservational assessment of oak-ash-elm gallery forests. Report. (in Hungarian)
Library, Department of Plant Taxonomy & Ecology, L. Eötvös University, Budapest.
1992.

Occasional stands of high floodplain oak-ash-elm gallery forests are characterized by 20 phytosociological relevés and by the synthetic table constructed from them. As the nature conservational value analyses show, most stands exhibit the signs of degrad0ation, especially by the presence of species characteristic of tree plantations and arable fields.

Sz.M./H.I.

318. Simon, T. - Szabó, M. - Hahn, I. - Draskovits, R. - Gergely, A.

Ecological and phytosociological changes in the willow woods of Szigetköz, NW Hungary, in the past 60 yeas.
Abstracta Botanica 17: 179-186.
1993.

The authors describe different stands of willow woods by phytosociological relevés and compare them with the results of earlier surveys (Zólyomi 1937, Kárpáti 1957). The description characterizes present status, whereas this comparison it was possible to survey and assess the characteristics of the changes in the past 3-6 decades.

Sz.M./H.I.

319. Simon, T. - Szabó, M. - Hahn, I. - Kovács Láng, E. - Gergely, A.

Biological program for regional monitoring system I-VII., Manuscripts. (in Hungarian)
Library, Department of Plant Taxonomy & Ecology, L. Eötvös University, Budapest.
VIZITERV, Budapest.
from 1992, Észak-dunántúli Környezetvédelmi Felügyelőség, Győr.

1986-1992.

These reports contain phytosociological data collected from permanent quadrats set out in 1986. For each site the flora of 1 25x25 m quadrat and estimated A-D values of species are given. A flora list of the neighbourhood is also presented. The analyses of these data include the spectra of W indicator values and nature conservational values together with diversity and evenness measures of these spectra.

Sz.M./H.I.

320. Simon, T. - Szabó, M. - Hahn, I. - Sasvári, L.

Environmental quality assessment of the upper Danube region 1986-1992.
Manuscript. (in Hungarian)
Library, Department of Plant Taxonomy & Ecology, L. Eötvös University, Budapest. pp., 55.
1993.

The manuscript describes the botanical, ornithological and entomological monitoring network of the area, which was founded in 1986. According to available results a s99light change has occurred in the characteristics of the monitored groups of organisms in the past few years. The authors think that reason for this change is the decrease in water supply. In the past few years there has been less water available in the riverbed of both the main branch and the branch system than the native organisms had been accustomed to. This has had a disadvantageous effect on the speed of water current in the branch system, too. These two factors are in the 9background of the drying tendency in the past six years. Changes of this period indicates that natural communities of the area are unable to withstand further drying without considerable changes in community structure.

Sz.M./H.I.

321. Soós, Á.

On the leech fauna of the Hungarian reach of the Danube.
Opusc. zool. Budapest, 7: 241-257.
1967.

Material taken from the main stream and the Mosoni Duna was identified. Three species were found in the main stream, nine in the Mosoni Duna. The results are discussed according to species.

F.L.

322. Stollmann, A.

New nesting-sites of the White-tailed Sea-eagle near the Danube in Czechoslovakia.
Aquila, 59-62, 379-380.
1955.
One pair of White-tailed Sea-eagle *(Haliaeetus albicilla)* was breeding

regularly along the Danube riverine forest at Gabcikovo-Bős. In some years the nesting pair was disturbed by human activity, and hence the incubation was discontinued.

B.A.

323. Studinka, L.

Migration of numerous Black Storks and other ornithological observations in the Szigetköz.
Aquila, 63-64, 263.
1957.

There are some regular rare migrants on the Szigetköz section of the Danube, like: Black Stork *(Ciconia nigra)*, Osprey *(Pandion haliaetus)*, Common Crane *(Grus grus)*. The nesting of Dunnock and Icterine Warbler was proved.

B.A.

324. Szabó, M. - Hahn, I.

Botanically valuable sites in the Szigetköz, deserving protection Manuscript. (in Hungarian)
Library, Department of Plant Taxonomy & Ecology, L. Eötvös University, Budapest.
Fertő National Park, Sopron.
1992.

The authors make their proposal on the territories deserving protection in the Szigetköz using the results of their own research and the data in the literature. For each location the reasons for proposed protection are listed. The borders of core areas and buffer zones are given in the enclosed map (1,25 000).

Sz.M./H.I.

325. Szabó, M. - Hahn, I.

Results and tasks of botanical researches in the Szigetköz, Manuscript. (in Hungarian)
Library, Department of Plant Taxonomy & Ecology, L. Eötvös University, Budapest.pp., 75.
1993.

This study introduces all the persons and institutions that have been involved in the botanical researches of the Szigetköz in this century. Then a short summary of the existing results are given. In the IV. chapter conclusions are drawn and tasks for future studies are also listed. A detailed botanical bibliography is enclosed.

Sz.M./H.I.

326. Szerdahelyi, T.

Gallery forests in the Szigetköz protected area. Hungary. (in Hungarian)
Studia Bot. Hung., In press.
expected in 1993.

This work contains computer aided analyses of phytosociological data collected from 76 10x10 m quadrats. Results of cluster analysis were compared with spectra of floristic and coenological characters and nature conservational value. Present state of the community is characterized, different stands types are distinguished.

Sz.M./H.I.

327. Terpó, A.

Kritische Revision der Arum-Arten des Karpatenbeckens.
Acta Bot. Hung. 18: 215-255.
1973.

This revision of the Arum genus contains some data on the occurrence of *Arum italicum and Arum maculatum* in the Szigetköz.

Sz.M./H.I.

328. Tirják, L.

The population of the Willow Tit in the Szigetköz.
Mad-Táj., 1-4: 28-29.
1988.

The article publishes the first nesting data of the Willow Tit *(Parus montanus)* in the Szigetköz.

B.A.

329. Vasas, G.

Report on complex researches assessing cryptogams of the Szigetköz in 1992. (in Hungarian)
Botanical Department, Hungarian Natural History Museum, Budapest.
1992.

This report contains results of researches on algae, fungi, lichens and mosses. Floristical data, estimates of population size, distribution map of rare species and assessment of human impacts are presented. The material is supplemented by the results of a phytosociological survey on Oak-Ash-Elm gallery forests.

Sz.M./H.I.

330. Waliczky, Z.

Structure of avian communities in the forests of Szigetköz

Ornis Hungarica 2: 25-31.
1992

Bird density estimations were carried out in poplar, willow and oak forests in 1990. The willow-woodland show the highest species number and overall density, while the poplar plantations were the poorest in both respects. The richest willow habitats are highly threatened by the forestry, which prefer the more economical poplar species.

B.A.*

331. Waliczky, Z. - Moskát, C. - Báldi, A. - Lőrincz, G.

Habitat selection of icterine warblers (Hippolais icterina Vieill. 1817) in the Szigetköz.
Aquila 98: 135-140.
1991

Habitat selection of breeding icterine warblers was studied. Vegetation samples were taken from site where singing individuals were seen, and these samples were compared with vegetation of random sites. Our results showed, that the habitat selection of icterine warblers is not random.

B.A.*

332. Werner, E.

Botanical values of the upper Szigetköz. (in Hungarian)
Mosonmagyaróvári Kossuth L. Gimn. Évk. 1989-1990, 20-29.
1990.

As a result of many years' research, exact locations of 112 plant species, including 36 protected species, are presented. Several species have their first records from the Szigetköz in this paper.

Sz.M./H.I.

333. Werner, E.

Strictly protected and protected plants along the Mosoni Danube, Kisrév-Zátony-Vajka Danube branches in the Szigetköz Landscape Protection Area, Manuscript. (in Hungarian)
Directorate, Fertő National Park, Sopron OTvK, Budapest, Fertői NP Igazgatósága, Sopron.
1987.

This report contains the list, known localities, estimated abundance and characteristic community of each protected plants and orchids. Locations are given.

Sz.M./H.I.

334. Wiktor, A. - Szigethy, A.

Distribution of slugs in Hungary.
Soósiana, 10, 11: 87-111.
1982.

Revised species and locality lists of the slugs in the Hungarian collections, containing data from the Szigetköz, too.

M. G.

335. Zicsi, A.

The easthworm fauna in the shoreline of the upper Hungarian Danube section. (in German)
Annls Univ. Sci. Budapestinensis.
Sectio Biologica, 3: 427-442.
1960.

In the years 1954-58 samples were collected between Rajka and Mohács at five localities, one species, *Octolasium lacteum* was found at Rajka.
Later the athor collected in the upper Danube reach (1825-1691 rkm) at 19 localities and recorded altogether 18 species. There were four sampling sites in the Szigetköz region, 13 taxa were found. Species are listed by localities, taxonomic notes and ecological observations are given.

F.L.

336. Zicsi, A.

The easthworm fauna in the shoreline and islands of the Hungarian Danube. (in German)
Annls Univ. Sci. Budapestinensis.
Sectio Biologica, 4: 217-231.
1961.

Samples were collected at Rajka and on the islands between 1841-1728 rkm in the Szigetköz region. Eleven taxa were recorded at Rajka, ten were found on the islands.

F.L.

337. Zólyomi, B.

Results of the botanical researches of the Szigetköz. (in Hungarian)
Bot. Közlem. 34: 169-192.
1937.

Data on the distribution of 60 species are given. Phytosociological characteristics of the 5 most important forest communities are also described. A scheme of floodplain succession is drawn.

Sz.M./H.I.

Aquatic ecosystems

338. Ambrus, A. - Bánkúti, K. - Kovács, T.

The Odonata fauna of the Little Hungarian Plain and the western most part edge of Hungary. (in Hungarian)
Győr, 2: 1-81.
1992.

The authors considerably increased scientific knowledge concerning the *Odonata* fauna in the area. The collection of larval data was a new element in the study of the area. Eleven new species for the area were found among the larvae. It was suggested that the habitats in which certain species occurred should be protected. Several species were also recorded from the Szigetköz area.

O.N./G.P.

339. Andrássy, I.

The Nematoda fauna of the interestitial water along the Danube from Bratislava to Budapest. Danub. Hung. XVII. (in German)
Arch. f. Hydrobiol. Suppl. Donauforschung, 27: 91-117.
1962.

The article taxonomically described in detail 27 *Nematoda* species from fifteen sampling sites along the Hungarian Upper Danube (Bratislava-Budapest). This preliminary survey also revealed the presence of three new species which had not been scientifically described.

O.N.

340. Andrássy, I.

The benthic Nematoda fauna of the fine sediment in the Moson Reach. Danub. Hung. XXXIV. (in German)
Opusc. Zool. Budapest, 6: 35-44.
1966.

A taxonomical description of nematodes in the Moson Reach on the basis of sediment samples from three localities (Mosonmagyaróvár, Magyarkimle, Lackópuszta) from 1962 and 1963 was made to establish the nematode fauna present in this section of the Danube, which is nearly 127 km long.

O.N.

341. Andrássy, I.

Mud-living Nematoda of the Mosoni-Duna. (in German)
Opusc. zool., Budapest, 6: 35-44.
1967.

These are the first *Nematoda* data from this river section. Seven localities were sampled, and 17 species recorded.

The number of species varied between 1 and 8. New species also were described.

F.L.

342. Ardó, J. - Richnovszky, A.

New data on the Mollusca fauna of the Danube at Bratislava. (in German)
24. Arbeitstagung der IAD. Szentendre. Wissenchaftliche Kurzref., 1: 141-142.
1984.

Sampling to establish the distribution of aquatic molluscs was carried out in the Danube at four localities between Bratislava and Gabcikovo from 1982 to 83. A total of eight species (six snails, two mussels) were found.

G.P.

343. Ábrahám, M. - Várday, N.

Water quality changes in the Danube between Rajka and Nagymaros. (in Hungarian)
Environmental Protection and Water Management 76. Annual Meeting of the Hungarian Hydrological Society. Sopron, 1-8.
1976.

The water quality changes of the Danube between Rajka and Nagymaros were identified on the basis of the results of standard measurements between 1967 and 1975.
The most important findings were the following:

-- the mineral matter content of the Danube was dependent only on water discharge;
-- the indexes of the pollution load originating from the catchment upstream of the Hungarian border worsened from year to year independently of the effect of water discharge and temperature;
-- natural self-purification processes were difficult to measure between Rajka and Győrzámoly, where a number of water courses join the Danube, but an improvement of the water quality was detectable downstream;
-- tributaries downstream to Komárom polluted the Danube again, their effect could be measured even at Nagymaros;
-- between Gönyű and Nagymaros an organic matter content equivalent to 400-600 tons of COD decomposed in the Danube.

The natural self-purification capacity was not always sufficient for the decomposition of the total pollution load entering this section of the Danube.

G.P.

344. Ábrahám, M. - Várday, N.

Water quality problems on the Rajka-Esztergom Danube section. (in Hungarian)

Hidrológiai Közlöny, 57: 60-64.
1977.

Water quality changes along the Rajka-Esztergom Danube section were established using the results of the regular water quality monitoring between 1967 and 1975.
On the basis of the data series at Rajka ;

-- an inverse relationship was recognized between the water discharge and the total anion and kation concentration and the conductivity of the water.
-- the relative amount of Na increased at low water discharges as to compared to other kations;
-- upstream at the investigated transect the organic pollution load of the Danube became higher every succeeding year;
-- the concentrations of inorganic nutrients necessary for plants and algae (nitrogen and phosphorus compounds) increased together with the trophic level of the water;
-- in the main current, where the current velocity was higher and as a consequence the oxygen supply higher, the water was cleaner and the self-purification processes faster than those near to the bottom or the bank.

Although no extra pollution entered the river from the right bank side along the Rajka-Győrzámoly section the appropriate parameters did not decrease, in some cases they even increased.
Self-purification could be detected along the Győrzámoly-Esztergom stretch but it was not sufficient to stabilize the increase of the COD of the Danube.
The estimated self-purification capacity of the Danube along the Gönyű-Esztergom section was equivalent to the COD of 400-600 tons of organic matter in a day.

G.P.

345. Ács, É. - Buczkó, K.

Comparative algological studies on the periphyton in the branch-system of the River Danube at Ásványráró (Hungary).
30. Arbeitstagung der IAD, Zuoz - Switzerland 1994. Wiss, Kurzref. 413-416.
1994.

The algal composition of the periphyton was studied in the branch-system of the River Danube at Ásványráró on different submersed substrates in the summer of 1992. Samples were collected both from running and almost standing water points. Altogether 139 taxa were identified. According to our results samples from the running water points can be characterised by lower diversity and species count than samples from the standing water points. The periphyton of the standing water points had higher evenness, there were no such dominant species as in the periphyton of the running water points. Samples taken from the same sampling points resembled each other more than samples collected from the same substrates.

Current conditions seem to be the most important factors in the development of the periphyton.

K.K.T./B.Á.

346. Ács, É. - Kiss, K. T.

Investigation of periphytic algae in the Danube at Göd (1669 river km, Hungary).
Arch. Hydrobiol. Algological Studies, 62: 47-67.
1991.

Samples were collected from artificial substrate at Göd in 1985-86. An indirect conclusion was that periphytic algae can have a considerably greater importance in the reservoirs of the river barrages than in the main arm. In slow moving areas, where light can penetrate more deeply the fast reproduction of benthic algae can lead to benthic eutrophication.

O.N./K.K.T.

347. Ács, É. - Kiss, K. T.

Effects of the water discharge on periphyton abundance and diversity in a large river (River Danube, Hungary)
In: Padisák, C. S. Reynolds & U. Sommer (eds), Intermediate Disturbance Hypothesis in Phytoplankton Ecology.
Hydrobiologia 249: 125-133.
1993.

This paper examines the relevance of the intermediate disturbance theory in the context of the algal flora attaching to artificial substrata in a large river. The theory was in a good agreement with most of the communities analysed, however, with different frequency intervals compared to phytoplankton. Floods provided the most significant disturbances. As a rough generalization, we can say that in case of floods following each other in 8-14 days, respectively, the disturbance is of medium frequency. In case of 8 days, high frequency is more typical while in case of 14 days, low frequency is more characteristic. Owing to the fact that riverine periphytic algal organisms are attached in different ways and with differing efficiencies, the changes in the total mass occurring as a result of changes in water discharge lead to changes in diversity. The analysis of individual numbers can help in investigating the intensity of the disturbing effect on the algal communities. Negative correlation was found between water discharge and numbers of individuals, that is, the numbers of algae increase with low water discharge and decrease with high water level in the river. In respect of the periphyton formed on the surface of the riverbeds in large rivers with considerable changes in the water level, a more complex system can be supposed where part of the periphyton is periodically dried and flooded alternately.

K.K.T./B.Á.

348. Ács, É. - Kiss, K. T.

Colonization processes of diatoms on artificial substrates in the River Danube near Budapest (Hungary)
Hydrobiologia 269/270: 307-315.
1993.

Periphyton was collected from sand-blasted slides exposed in the main channel of River Danube at Göd (1669 rkm). Samples were taken from 21 May to 23 November in 1984. Three to four days after placing the substrates into the river the first traces of an observable coating appeared. The formation of the algal coating in the Danube presented certain periodical features. From time to time, an essential decrease in the number of individuals could be observed, which generally coincided with changes in the structure of the community.

K.K.T./B.Á.

349. Ács, É. - Kiss, K. T.

Effects of the water discharge on periphyton abundance and diversity in a large river (River Danube, Hungary).
Hydrobiologia, 249: 125-133.
1993.

Samples were collected from artificial substrate at Göd in 1985-86. An indirect conclusion was that periphytic algae can have a considerably greater importance in the reservoirs of the river barrages than in the main arm. In slow moving areas, where light can penetrate more deeply the fast reproduction of benthic algae can lead to benthic eutrophication.

O.N./K.K.T.

350. Balogh, V. K. - Bothár, A. - Kiss, K. T. - Vörös, L.

Bacterio-, phyto-, zooplankton of the River Danube.
Verh. Internat. Verein. Limnol. 25: 1692-1694.
1994.

The qualitative and quantitative composition of the phytoplankton and the *Crustacea* plankton was investigated weekly, the biomass of the bacterioplankton, picoplankton and heterothrophic nannoflagellates, the primary algal and secondary bacterial production monthly at Göd (1669 riv. km).
The peak values of the phytoplankton density (38-53 mg/l biomass - wet weight), chlorophyll-a content (132-143 μg/l) and primary production (339-774 mg C/m^2/h) were found in low water periods in April and September. The bacterial biomass varied between 0.232 - 0.787 mg/l, usually in inverse relation to the water discharge. The maximal bacterial secondary production was found between April and June (4.06 - 5.63 μgC/l/h). The crustacean zooplankton biomass was low (0.01 - 0.189 mg/l).

The trophic level of the River Danube was hypertrophic in the growing season at low water periods.

A.J./B.Á.

351. Bartalis, T. É. - Dvihally, Zs. T. - Kiss, K. T. - Schmidt, A.

The investigation of oxygen dependent factors along the Middle Danube. III. (in German)
24. Arbeitstagung der IAD. Szentendre, Wissenschaftliche Kurzref., 1: 1-4. 1984.

The authors measured water chemical and algological parameters and the primary production at four localities (Rajka, 1848 river km; Almásneszmély, 1751 river km; Göd 1669 river km; Baja, 1481 river km) in four months (June, July, September, October) in 1983. The parameters investigated were the water discharge (m^3 sec^{-1}), water temperature (C°), dissolved oxygen concentration (mg l^{-1}), oxygen saturation (%) total and net production, respiration (g O_2 m^{-3} day^{-1}), algal individual number (ind. l^{-1}) and chlorophyll-a concentration (mg m^{-3}).
In the summer of 1983 at Göd, total production was double of what it had been in the years 1975-82. The trophic level of the Danube also increased on the (Bratislava) Rajka - Budapest section. In low water periods the individual number of algae and the chlorophyll-a concentration increased by 50 to 150 %.

O.N.

352. Bartalis, T. É. - Dvihally, Zs. T. - Ertl, M. - Kiss, K. T. - Schmidt, A.

The investigation of oxygen dependent factors along the Middle Danube. IV. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 117-121. 1985.

The authors measured water chemical and algological parameters and the primary production at five localities (Rajka, 1848 river km; Gabcikovo, 1820 river km; Almásneszmély, 1751 river km; Göd 1669 river km; Baja, 1481 river km) in six months (May, June, August, September, October, November) in 1984. The investigated parameters were the following: water discharge (m^3 sec^{-1}), water temperature (C°), dissolved oxygen concentration (mg l^{-1}), oxygen saturation (%) total and net production, respiration (g O_2 m^{-3} day^{-1}), individual number of algae (ind. l^{-1}), chlorophyll-a concentration (mg m^{-3}).
The trophic level along the (Bratislava) Rajka - Budapest section obviously increased with a 50 to 150 % higher individual number of algae and chlorophyll-a concentration in low water periods.

O.N.

353. Bartalis, T. É. - Dvihally, Zs. T. - Ertl, M. - Kiss, K. T. - Schmidt, A. - Tomajka, J.

The investigation of oxygen dependent factors along the Middle Danube.

V. (1985.) (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 330-334.
1987.

The authors measured water chemical and algological parameters and the primary production at five localities (Rajka, 1848 river km; Gabcikovo, 1820 river km; Almásneszmély, 1751 river km; Göd 1669 river km; Baja, 1481 river km) in six months (May, June, July, August, September, October) in 1983. The investigated parameters were the following: water discharge (m^3 sec^{-1}), water temperature (C°), dissolved oxygen concentration (mg l^{-1}), oxygen saturation (%) total and net production, respiration (g O_2 m^{-3} day^{-1}), individual number of algae (ind. l^{-1}), chlorophyll-a concentration (mg m^{-3}).
The trophic level along the (Bratislava) Rajka - Budapest section obviously increased with a 50 to 150 % higher individual number of algae and chlorophyll-a concentration in low water periods.

O.N.

354. Bartalis, T. É. - Dvihally, Zs. T. - Kiss, K. T. - Schmidt, A. - Tomajka, J.

The investigation of oxygen dependent factors along the Middle Danube VI. (1986) (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 330-334.
1987.

The authors measured water chemical and algological parameters and the primary production at five localities (Rajka, 1848 river km; Gabcikovo, 1820 river km; Almásneszmély, 1751 river km; Göd 1669 river km; Baja, 1481 river km) in six months (May, June, July, August, September, October) in 1983. The investigated parameters were the following: water discharge (m^3 sec^{-1}), water temperature (C°), dissolved oxygen concentration (mg l^{-1}), oxygen saturation (%) total and net production, respiration (g O_2 m^{-3} day^{-1}), individual number of algae (ind. l^{-1}), chlorophyll-a concentration (mg m^{-3}).
The trophic level along the (Bratislava) Rajka - Budapest section obviously increased with a 50 to 150 % higher individual number of algae and chlorophyll-a concentration in low water periods.

O.N.

355. Bartalis, É. T. - Horváth, L.

Changes in the water quality of the side-arm system on the right side of the Danube in the river section between rkm 1848 and 1806 from October 15 - November 1992.
30. Arbeitstagung der IAD, Zuoz - Switzerland 1994. Wiss, Kurzref. 128-131.
1994.

The study describes the changes in the water quality of the side-arm system on the right side of the Danube in the river section between rkm 1848 and 1806 on the basis of regular water quality examinations conducted before and after the operation of the Gabcikovo dam started.

The diversion of the river into a new artificial bed caused a water level decrease in the main bed and the drying out of the side-arms. Simultaneously with this process extreme fluctuations were measured in the permanganate chemical oxygen requirement (COD/$KMnO_4$), nitrate and phosphorous form and chlorophyll a values in the remaining water bodies of the side-arms.

T.B.É./B.Á.

356. Bánhegyi, J.

Aquatic Hypomycetes of the Danube. Danub. Hung. XVIII.
Ann. Univ. Sci. Budapest. Sect. Biol., 5: 13-26.
1962.

The author gives a detailed taxonomical description of *Hypomycetes* species from the Danube between Zebegény and Budapest, in a small stream entering the river at Göd and in the Malom stream, a tributary of the Danube at Zebegény. Besides the detailed description of the sampling localities, the article also contains a broad overview and a critical discussion of the literature.

O.N.

357. Benedek, P.

On the water quality of the Danube. (in Hungarian)
Hidrol. Közl., 66: 193-205.
1986.

The article gives a summary on the available water chemistry data on the Danube. Barrages considerably changed the physical, chemical and biological conditions and processes of the affected rivers. There is a need for joint water quality regulations. There are hydrobiological working groups in all Danubian countries, which work on the elucidation of the ecological characteristics of the Danube. Reservoirs increase the trophic level. Planning was undertaken to make toxicological studies more extensive.
The saprobity (BOD) of the dammed sections will increase, they carry non-purified or partly purified water into the Danube. The bed load accumulated upstream of the Austrian barrages. The water quality is affected by the suspended matter content of the water. Upstream Gönyű the Danube belonged to the first or second water quality class. The increase in the nitrate concentration was caused by artificial fertilizers. The study also contains recommendations for the development of a joint drinking water quality evaluation system.

O.N./B.Á.

358. Berczik, Á.

The analysis of Chironomidae larvae distribution in the periphyton of floating objects in the Danube between Rajka and Budapest. Danub. Hung. XXXIX. (in German)

Acta Zool. Hung. 12: 41-51.
1966.

The qualitative and quantitative description of *Chironomidae* larvae from 27 floating pontoons between Rajka and Budapest is presented. Important sampling localities in the Szigetköz were Rajka (1848 river km), Dunaremete (1824 river km), Ásványráró (1816 river km), Medve (1806 river km) and Gönyű (1796 river km).
The article also contains the hydrographical characteristics of the section, the description of the sampling localities, fauna lists and ecological data.

O.N.

359. Berczik, Á.

On the backwater fauna of the Danube in Hungary. Danub. Hung. XXXV. (in German)
Opusc. Zool. Budapest, 6: 79-91.
1966.

The author summarizes the available faunistical data on the Hungarian section of the Danube including the Csallóköz, Szigetköz and the Moson Reach, indicating and describing the sixteen sampling sites chosen for this section of the river.

O.N.

360. Berczik, Á.

Benthic Chironomidae in the Moson Reach. Danub. Hung. XLI. (in German)
Opusc. Zool. Budapest, 7: 45-54.
1967.

The article contains the results of the investigation of the Moson Reach at five localities (from the Lajta mouth to Győr) between the 20.6.1962. and 27.5.1963. in three seasons, summer, autumn and spring.
The list of benthic chironomids includes several species not previously known in Hungary, with faunistical and qualitative analysis. Additional list of other sediment dwelling invertebrates are also given.

O.N.

361. Berczik, Á.

On the benthic Chironomidae fauna of the Hungarian Danube section. Danub Hung. XLIX. (in German)
Acta Zool. Hung., 5: 277-285.
1969.

After the general hydrological description of the Hungarian section of the Danube, the author gives a detailed analysis of the benthic *Chironomidae* communities found in a 343 km stretch based upon 33 sediment samples taken from 11 localities. Five of the localities (Gönyű, Komárom,

Zebegény, Alsógöd, Lupasziget) are affected by the Gabcikovo Nagymaros River Barrage System. Besides community composition data the study also contains information on water level fluctuation, water temperature and substrates.

O.N.

362. Berczik, Á.

The Chironomidae fauna of the littoral zone along the Hungarian Danube section. Danub. Hung. L. (in German)
Opusc. Zool. Budapest, 9: 249-254.
1969.

The *Chironomidae* fauna of the littoral zone is described along the Rajka-Gönyű, Gönyű-Budapest and Budapest-Mohács sections on the basis of samples from 1958 to 1961. Nine of the forty-six localities are along the Szigetköz stretch: Rajka (1848 river km), Dunakiliti (1841 river km), Fácán sziget (1830 river km), Dunaremete (1825 river km), Lipót (1824 river km), Ásványráró (1819 river km), Szap (1810 river km), Medvei híd (1806 river km), Nagybajcs (1802 river km).
The hydrological characteristics of the sections, water level and temperature data at the sampling localities and the species lists of the sections and the sampling localities are also given.

O.N.

363. Berczik, Á.

The Chironomidae fauna and its habitats along the Hungarian Danube section. (in German)
Limnologica, 8: 61-71.
1971.

The article summarises the distribution of *Chironomidae* species among the different habitats (benthos, the periphyton of floating pontoons, littoral zone) between 1961 and 1966. 46 localities are discussed together with the hydrological characteristics of the different sections and the detailed description of the habitats.

O.N.

364. Berczik, Á.

About the hydrobiological consequents of the changed hydrological conditions in the Szigetköz side arm system. (in German)
3. Arbeitstagung - Erdwissenschhaftliche Aspekte des Umweltschutzes. Wien. Kurzfassungen, 65-66.
1994.

River regulation activity due to flood protection and navigation has occured along the Szigetköz section of the Danube since the middle of the last century.
The brief evaluation of their hydrobiological effects is followed by a short

overview of the hydrobiological and ecological consequences of the construction of the Gabcikovo River Barrage and a separate section on the diversion of the Daube. The conclusions refer only to the Hungarian part of the impacted area, the old, abandoned river bed and thew surface waters of the Szigetköz.

B.Á.

365. Bereczky, M. Cs.

The investigation of the Protozoa fauna of the Danube at Alsógöd (Hungary). Danub. Hung. LII. (in German)
Opusc. Zool. Budapest, 9: 87-97.
1969.

Seventy *Ciliata* and *Testacea* species were found at Göd between August, 1966 and March, 1968. Sensitive and typical species indicated an oligo-mesosaprobic water quality for the Danube.

O.N./Cs.F.

366. Bereczky, M. Cs.

The effect of water temperature on the composition of the Ciliata fauna of the Danube at Alsógöd. Danub. Hung. LVI. (in German)
Ann. Univ. Sci. Budapest, Sect. Biol., 13: 291-294.
1971.

The annual distribution pattern of nine cosmopolitan *Ciliata* species was investigated in the Danube. It was proven that temperature has an effect on seasonal qualitative changes.

O.N./Cs.F.

367. Bereczky, M. Cs.

On the Ciliata fauna of the Szentendre and Vác arms of the Danube. (in Hungarian)
Hidrol. Közl., 52: 214-217.
1972.

Samples were collected from the Szentendre arm and the parallel main arm section of the Danube at fortnightly intervals in 1970. The biological parameters were usually within the moderately polluted range but a local pollution source could lead to the proliferation of saprobiont species predicting a possible worsening of the water quality.

O.N./Cs.F.

368. Bereczky, M. Cs.

The Ciliata fauna of the Hungarian section of the Danube and its biological role. (in Hungarian)
Göd, 1-193. Library of the Hungarian Acedemy of Sciences.

1972.

The PhD. thesis summarised the results of the data series from Göd and 29 other Danubian localities. The chapters dealt with the literature, methods, planktonic *Ciliata*, saprobiological analyses etc. (Certain sections were also published in other journals.).

O.N./Cs.F.

369. Bereczky, M. Cs.

The saprobiological characterization of the Danube at Budapest and downstream using Ciliates as bioindicators. (in German)
16. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 6.
1973.

The water quality of the Danube in Budapest and downstream to Budafok was monitored using *Ciliata* indicator species. Using earlier data collected upstream to Budapest the water quality of different sections were compared. The water quality of the Danube was worse entering Hungary than it was when it was leaving the country.

O.N./Cs.F.

370. Bereczky, M. Cs.

The effect of water level decrease on planktonic ciliates in the Danube and the evaluation of their saprobiological needs using short-term studies. (in German)
16. Arbeitstagung der IAD. Regensburg. Wissenschaftliche Kurzref., 163-180.
1975.

According to the results the decrease of the water level reduced the number of species but had little effect on individual numbers in the short term. There was a greater abundance of ciliates in the morning (8 a.m.) than in the evening (8 p.m.) but even if there were quantitative changes saprobiologically the water quality remained constant.

O.N./Cs.F.

371. Bereczky, M. Cs.

The ecological description of some *Ciliata* species in the Hungarian section of the Danube. Danub. Hung. LXXIII. 1. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 17: 123-136.
1975.

The article presents the ecological ranges of 27 dominant *Ciliata* species from the Danube in comparison with the results of other scientists investigating different habitats.

O.N./Cs.F.

372. Bereczky, M. Cs.

The effect of current velocity and water level fluctuation changes on the planktonic Ciliata fauna of the Danube. Danub. Hung. LXXVI. (in German)
Állattani Közl., 62: 15-21.
1975.

Planktonic protists can feed and reproduce in the middle region of the river if the current velocity is below 2 m sec-1. Actually it is not current velocity that limits their distribution but the increased amount of course grain-sized particles, which destroy the fine citoplasm. Characteristic communities in the main arm begin to develop after floods, when the water level is around 300 cm. Different species composition develops in the riparian and middle region.

O.N./Cs.F.

373. Bereczky, M. Cs.

The effect of decreasing water levels on planktonic ciliates in the Danube and the evaluation of their saprobiological conditions using short-term studies. Danub. Hung. LXXXII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 18: 179-188.
1976-1977.

The daily rhythm of the planktonic *Ciliata* distribution was investigated at Göd. Samples were collected every 4 hours for a day and at 8 a.m. and 8 p.m. for another six days. At the same time water chemistry was also investigated in the transect. Data from the right and left bank and the main current were slightly different. It was surprising that the level of abundance was always significantly higher at 8 a.m. than in the evening.

O.N./Cs.F.

374. Bereczky, M. Cs.

The ecological characterization of some Ciliata species in the Hungarian section of the Danube. Danub. Hung. LXXXI. 2. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 18-19: 157-177.
1976-1977.

The ecological ranges (eight characteristics) of 21 typical Danubian *Ciliate* species were presented in comparison with the results of other protistologists investigating different habitats.

O.N./Cs.F.

375. Bereczky, M. Cs.

Saprobiological description of the Hungarian Upper Danube using protozoans as indicators. Danub. Hung. XLIV. (in German)
Opusc. Zool. Budapest, 14: 55-66.
1977.

The Hungarian Upper Danube sections (Dunaremete-Ásványráró-Medve, Gönyű-Szob, respectively) were described saprobiologically with the species and individual number of protozoans in May, July and October, 1971. The species lists of the sampling localities, distribution of the number of species along the sections and saprobiological characteristics (star diagram) were also presented together with a comparative evaluation concerning other stretches of the Danube.

O.N.

376. Bereczky, M. Cs.

The effect of the hydrological regime and water engineering on the Ciliata and Testacea populations of the Danube between Vác and Göd. Danub. Hung. LXXXIX. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 20-21: 205-227.
1978-1979.

The protozoan communities of the Danube between Vác (1678 river km) and Göd (1669 river km) were investigated in five transects at different water levels. Downstream at transverse dikes, lentic areas can often be found at their bases. When two transverse dikes are near to each other the slow water movement helps the development of the population but even the slightest water level increase washes them away. Besides the results of changes caused by water engineering, in semi- natural transects the accumulation of polluting agents often causes changes (e.g. at Égető island). The lower the water level, the more diverse the mosaic pattern of the communities. This is most apparent regarding the number of individuals.

O.N./Cs.F.

377. Bereczky, M. Cs.

Comparative investigation of planktonic Testacea in the main arm and in a side arm of the Danube at Göd (1669 river km). Danub. Hung. XC. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 20-21: 229-236.
1978-1979.

The *Testacea* fauna of large rivers was less well-known than that of *Ciliates*. The weight of the shells was investigated. As in lakes benthic species have heavier shells with a structure which differs from that of planktonic ones.
In the main arm the situation was completely different. *Testaceans* were just a concomitant element in the open water of the Danube. Two reasons explain this phenomenon. Most of them are oligosaprobiont organisms living in unpolluted water. Their feeding habits (grazing) also restrict them to certain habitats.

O.N./Cs.F.

378. Bereczky, M. Cs.

The faunistic, ecological and saprobiological study of Ciliata on the Hungarian Danube section (1966-76). (in German)
19. Arbeitstagung der IAD. Sofia. Wissenschaftliche Kurzref., 235-238.
1979.

The Danube between Rajka and Mohács was described on the basis of the faunistic, ecological and saprobiological role of Ciliates. Nearly 1,500 samples from 29 localities were evaluated. 190 species were found in 1966 and 1967. Ecological data, the saprobiological categorization of the river section and bioindication are also discussed.

O.N.

379. Bereczky, M. Cs.

Comparative investigation of planktonic Testacea in the main arm and in a side arm of the Danube at Göd (1669 river km). (in German)
21. Arbeitstagung der IAD. Novi Sad. Wissenschaftliche Kurzref., 169-170.
1979.

Samples were collected every fortnight from March to November on the main and the side arm of the Danube at Göd in 1976. Several water chemical parameters were also measured. 24 and 18 species were present in the main arm and the side arm, respectively. The individual number was the highest during the summer in both habitats. Euplanktonic species only occurred in the side arm, which lost its direct connection with the main arm in the summer.

O.N./Cs.F.

380. Bereczky, M. Cs.

The study of the Thecamoeba community of the Danube. (in German)
24. Arbeitstagung der IAD. Szentendre. Wissenschaftliche Kurzref., 73-76.
1984.

The vertical distribution of the *Testacea* fauna in the Danube was investigated at Göd. This community had low species diversity of a rather uniform distribution and did not show any vertical differentiation either in terms of species or individual numbers at Göd in any season.

O.N./Cs.F.

381. Bereczky, M. Cs.

A saprobiological description of the Hungarian Upper Danube using ciliates as bioindicators. (in Hungarian)
In: T. Dvihally Zs. (ed.): A kisalföldi Duna-szakasz ökológiája. VEAB Publication, 126-147.
1987.

The article gives a qualitative and quantitative overview and the

saprobiological evaluation of planktonic protozoans collected in the main arm of the Danube along the Szigetköz at Dunaremete (1825 river km), Ásványráró (1820 river km) and Medve (1805) and in the Ásványráró side arm system at nine sites in 1971, 1975-75, 1979-80 and 1984. Samples were collected in different seasons.
The main arm was β-mesosaprobic, moderately polluted. In the side arm the protozoan community proliferated up to six times its original size and new species were also present. The new species were characteristic organisms of dammed waters.

O.N.

382. Bereczky, M. Cs.

Similarities and differences between ciliates living in the Rhine and the Danube. (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 335-338.
1987.

In 1983 planktonic samples were collected from the Danube and the Rhine at the same time using the same method. Both rivers had rich protozoan communities. There were 76 common species out of the total 141 *Ciliates*. In spite of this, the Sörensen similarity index (on the basis of species) varied from only 0.22 to 0.04. The individuality of each river was obvious.

O.N./Cs.F.

383. Bereczky, M. Cs.

Interspecific relationship of some Suctoria species in the Danube.
Arch. Protistenk., 138: 251-255.
1990.

The interspecific association of periphytic *Suctoria* species on artificial substrate was investigated at Göd during the summer. The species composition of the periphyton depended on the species pool of the water. Those species were important in different processes determining the development of the periphyton (e.g. predation, competition) which were able to colonize the substrate. Most *Suctoria* species were β-mesosaprobic.

O.N./Cs.F.

384. Bereczky, M. Cs.

Seasonal changes in the feeding spectrum of planktonic ciliates in the Cikolaszigeti side arm system of the Szigetköz region. (in Hungarian)
Szegedi Ökológus Napok. 24. Tiszakutató Ankét. Abstracts: 7.
1993.

Due to the lack of current the original phytophage protist community became one with bacteriophage-phytophage dominance.

O.N./Cs.F.

385. Bereczky, M. Cs. - Gulyás, P.

Zooplankton studies in a side arm of the Danube in the Szigetköz region at Ásványráró. I. Species composition and abundance of zooplankton communities, diversity and saprobity. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 279-283.
1985.

The zooplankton community was surveyed at nine sites in the Ásványráró side arm system between 6 September and the 24 October in 1984. A total of 141 species were present (*Amoeba:* 2; *Testacea:* 10; *Heliozoa:* 1; *Ciliata:* 80; *Suctoria:* 27; *Rotatoria:* 27; *Cladocera:* 15; *Copepoda:* 5).
The article also discusses saprobity, similarity indexes and spatial-temporal distribution. A cluster analysis was also carried out and the main arm and the side arms were compared on the basis of *Rotatoria* abundance.

O.N.

386. Bereczky, M. Cs. - Nosek, J. N.

Structural investigations of periphytic protozoan communities in three layers of the Danube River. III. Analysis of the Saprobity relations. Danub. Hung. CVII.
In: Bereczky, M. CS.: Advances in Protozoological Research. Symp. Biol. Hung., 33: 217-224.
1986.

When stratification occurs in the Danube there is also a corresponding difference in saprobity. It was not always the same layer which had the best water quality. In 1979 it was the lowest layer, but in 1980 it was the highest layer. There was no link between depth and the period of exposure. Stratification, the difference between layers depended upon the development of the periphyton and could not be determined in an early stage.
The species composition of the periphyton changed with the season. The periphyton always indicated a worse water quality than the plankton.

O.N./Cs.F.

387. Bereczky, M. Cs. - Nosek, J. N.

The milieuspectrum of Danubian Ciliata populations. (in Hungarian)
I. Magyar Ökológus Kongresszus. Budapest. Abstracts, 31.
1988.

The investigation of euryoecious species revealed that the optimal milieu ranges could not be determined on the Danube because wider ranges could be created under laboratory conditions than in the Danube at Göd.

O.N./Cs.F.

388. Bereczky, M. Cs. - Nosek, J. N.

Niche studies on some Protozoa species on the Danube river (Hungary, Europe).
VIII. Int. Congr. of Protozoology, Japan. Abstracts: 100.
1989.

Four data series from years with differing water level fluctuations were selected for a niche study at Göd based on the Hutchinsonian concept. This selection enabled investigation into the effect of wide ranging changes in discharges. The greatest niche breath was indicated by the commonest, most wide ranging protozoa. In the Danube these species were, *Carchesium polypinum* on the water discharge axis, *Vorticella convallaria* on the ammonium axis.

O.N./Cs.F.

389. Bereczky, M. Cs. - Nosek, J. N.

The influence of nine ecological factors on the abudance of different ciliated Protozoa in the river Danube.
2nd. Int. Conf. in Hungary on Protozoology. In: "Current Problems in Protozoan Ecology". Abstracts, 13.
1991.

The effect of nine physical, chemical or ecological factors on the abundance of the populations of the commonest thirty Ciliata species was monitored at Göd.

O.N./Cs.F.

390. Bereczky, M. Cs. - Nosek, J. N.

Distribution of ciliated Protozoa in the River Danube.
European Journal of Protistology, 28.3. 1st European Congress of Protozoology. Bulmershe Campus. Univ. of Reading. Abstracts, 332.
1992.

The authors discuss the seasonal changes of the Ciliate communities at Göd in the Danube in the last two decades in correlation with several physical and chemical parameters, which were in positive correlation with the distribution of the species.

O.N./Cs.F.

391. Bereczky, M. Cs. - Nosek, J. N.

Protozoological investigations at Szob (1707 river km), Göd (1669 river km) and Lórév (1559 river km). (in Hungarian)
XXXIV. Hidrobiológus Napok. Tihany. ("Az áramló vizek kutatása") Programme and Abstracts, 12-17.
1992.

Altogether 317 protozoan species were identified. The number of

Testacea species was surprisingly high. There were great fluctuations in their individual numbers. These changes were due to the dam constructions on the Austrian section of the Danube.

O.N./Cs.F.

392. Bereczky, M. Cs. - Nosek, J. N.

The Influence of Ecological Factors on the Abundance of Different ciliated Protozoa populations in the Danube River. I. Investigation of the Ecological Amplitude.
Acta Protozoologica, 32: 1-16.
1993.

The ecological tolerance of the thirty most common *Ciliata* species (at least 10 % relative abundance in four years, 1981, 1985, 1986, 1987) were studied under different water level fluctuations.
No absolute inhibiting factor was found, the Danube provided a suitable medium for their existence. The complex relationship of different factors seemed to limit the populations. Most species were tolerant to current velocity, temperature, pH and the concentration of dissolved oxygen.
Other species were tolerant to human activity influenced factors such as the oxygen demand, ammonium concentration and the presence of two different bacterium populations.

O.N./Cs.F.

393. Bereczky, M. Cs. - Nosek, J. N.

Protozoological Investigations in the Side-Arm System "Szigetköz" of the River Danube.
IX. Int. Congr. of Protozoology, Berlin, Abstracts: 11.
1993.

The species composition of the different habitats was diverse and rich. After the total separation from the main arm the different sites may be characterized by their species composition. The analyses of the saprobiological conditions demonstrated that the amount of autochton organic matter increased with a decreasing current velocity.

O.N./Cs.F.

394. Bereczky, M. Cs. - Nosek, J. N.

Composition and Feeding spectrum of Protozoa in the River Danube, in particular the planktonic Ciliata.
Limnologica, (in press).
1994.

Euplanktonic *Ciliates* are the dominant protists in the middle part of the Danube. The available food supply was the determinant ecological factor in the distribution of these species.

The relative abundance of *Ciliata* species indicated Szob to be the most polluted (α-β-mesosaprobic) from among Szob, Göd and Lórév.

O.N./Cs.F.

395. Bereczky, M. Cs.

Ecological investigations of the protozoaplankton in the Cikola side arm system of the river Danube. (in Hungarian)
XXIst Congress of the Hungarian Biological Society, Pécs. p. 19. (Abstract).
1994.

The protozoa community of four side arm system habitat types had high species and individual numbers.
Floods rearrange the protozoa coenosis in the side arms. Species frequent in the main branch became dominant elements of great density for a short time gradually disappearing later as stading water characteristics developed.
Changes in the water supply of a side branch resulted in unfavourable changes in the life of planktonic *Ciliata.*

CS.F./B.Á.

396. Bereczky, M. Cs. - Nosek, J. N.

Protozoological investigations in the side arm system of the Szigetköz area. (in German)
30. Arbeitstagung der IAD Zuoz - Switzerland.
Wissenschaftliche Kurzref., 1: 45-48.
1994.

The authors investigated the species composition and abundance changes of the pelagic *Ciliata* communities in different water types in the side arm systems of the Szigetköz region after the water level sharply decreased in the main arm due to the diversion of the Danube. The feeding spectrum of the *Ciliata* communities changed, the previously dominant phytophage species were competed out by bacteriophage and predatory species. The increase in the amount of the organic matter in the water was indicated by the shape of the Köhler' species - individual ratio curves.

CS.F./B.Á.

397. Bereczky, M. Cs. - Oertel, N. - Nosek, J. N.

Examination-series on Protozoa colonization of artificial substrates in three water layers of River Danube.
Progress in Protozoology, Abstracts, VI. International Congress of Protozoology, Warsaw.
1981.

Uncoated glass slides and others coated with gelatine were placed in a metal basket to be used as a substrate. To evaluate the results, several

statistical methods were used e.g. MANOVA curve fitting path and cluster analysis. Initially the development of protozoa community appeared to be faster on the gelatine coated slides. Later, however, there was no noticeable difference between the two sets of slides. The growth of the sessile part of the community was more vigorous than that of the vagile.

O.N./Cs.F.

398. Bereczky, M. Cs. - Oertel, N. - Nosek, J. N..

Depth-dependent development of sessile Protozoa communities on artificial substrate in the river Danube. I. The question of stratification. Danub. Hung. CII. (in German)
Arch. f. Hydrobiol. Suppl. 68: 37-62.
1983.

The possibility of the development of vertical stratification in rivers above a certain current velocity had long been discussed by limnologists. This question was studied using periphytic and planktonic protist communities. The periphytic community was investigated in spring, summer and autumn for 32 days each season. Plankton samples were also regularly collected during those periods from three depths. Physical, chemical and ecological factors were also monitored. The results proved the existence of stratification in the Danube, which had been regarded impossible in running waters.

O.N./Cs.F.

399. Bereczky, M. Cs. - Oertel, N. - Nosek, J. N.

Structural investigations of periphytic protozoan communities in three layers of the Danube River. I. The question of stratification.
In: Wetzel, R.G. (ed.): Periphyton of Freshwater Ecosystems. Developments in Hydrobiology, 17. Dr. W. Junk, The Hague. 49-57.
1983.

The possibility of stratification in rivers was proved with physical-chemical parameters and surveys of planktonic and sessile protozoan communities. On the basis of sessile community analysis the subsurface layer was less stable providing less favourable living conditions for protozoans than the layer near the bottom of the river.

O.N./Cs.F.

400. Bertalan, O.

Report on the ichtyofauna of the impact area of the Gabcikovo Nagymaros River Barrage System in 1986. (in Hungarian)
MGESZV. Győr. Manuscript, 1-26.
1986.

The use of a computerised survey proved that favourable conditions existed for fish life in the aquatic system of the Szigetköz. Human impacts on the non-Hungarian parts of the Danube have led to a partial loss of the

breeding sites. Another phenomenon detected was the increase in the annual fish catch due to a decrease in the level of water pollution. Several species seemed to decline (e.g. pike). The quality of the fish yield decrease due to the increasing ratio of bream species. Intensive fishing, improved catching methods and the introduction of artificially bred fry led to a more juvenile aye structure. Examining the possibility of introducing certain species e. g. silver carp, grass carp and the artificial propagation of more valuable species should be considered.

G.P.

401. Binder, J. - Turi Nagy, J.

The effect of the Gabcikovo Nagymaros River Barrage System on the water quality of the Danube. (in Hungarian)
Hidrol. Közl., 70: 62-64.
1990.

Up to 1980 the water quality of the Danube had gradually worsened due to external pollution load. The effect of the newly commissioned sewage treatment plants could be detected from that year. Water flow will decrease, but oxygen uptake increase in the planned Hrusov-Körtvélyes reservoir. Sedimentation will only cause the temporary siltation in certain parts of the reservoir. There was no available data on the new microbiological processes partly because it also depends upon the quality of the water entering the reservoir and new sewage treatment plants. A regular monitoring system will be necessary to detect any future changes in water quality.

O.N./B.Á.

402. Boros, M.

On the future of the Szigetköz. (in Hungarian)
ÖKO, 3: 10-12.
1992.

The different habitats in the Szigetköz were analysed from an ecological viewpoint together with the water supply problems of the region. The article also contains predictions for the future of the region and the effects of the probable drought.

O.N./ B.Á.

403. Bothár, A.

Data on the Mollusca fauna of the Hungarian section of the Danube. Danub. Hung. XXXVI. (in German)
Opusc. Zool. Budapest, 6: 93-107.
1966.

The mollusc fauna of the Hungarian Danube section was mapped between Rajka and Mohács by collecting samples from 33 localities (*Mollusca*, *Lamellibranchiata*). The following areas were monitored in the

Szigetköz region: Dunaremete (1825 river km), Medve (1806 river km), Nagybajcs (1802 river km) in the main arm; the weir, Rajka, Dunakiliti bridge, Feketeerdő bridge, Lajta mouth, Mosonmagyaróvár, Máriakálnok, Magyarkimle, Lickópuszta, Zselye and Vének along the Moson Beach.
31 species were found. Their distribution, taxonomic and ecological status is also discussed in the text.

O.N.

404. Bothár, A.

The investigation of planktonic Entomostraca in the Danube during the great flood in 1965. Danub. Hung. XLVIII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 9-10: 87-98.
1968.

In July, 1965 the Danube flooded and broke its banks totally inundating its floodplain. The crustacean fauna of the flooded area at Göd (1669 river km) was analysed. Species composition and their individual numbers were completely different from those of the Danube. During the retention of the water the species composition of *Crustacea* in the Danube changed on a daily basis, where there was also a large fluctuation in terms of individual numbers.

O.N./A.J.

405. Bothár, A.

Plankton and benthos studies in the side arm of the Danube at Göd from 1965 to 1967. (in German)
14. Arbeitstagung der IAD. Vienna. Wissenschaftliche Kurzref., 6.
1971.

In 1965-67. samples were collected in seven-ten days intervals from open water and sediment to study the *Crustacea*, *Chironomidae* and *Oligochaeta* fauna at low, mean and high water discharges. During the vegetation period when the water level was low for a long period the side arms became lentic, which made the development of a rich fauna possible. The dynamic side arm - main arm connection is a determinant factor in the life of rivers.

O.N./A.J.

406. Bothár, A.

Hydrobiological studies in the side arm of the Danube at Göd. Danub. Hung. LXII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 13: 9-23.
1972.

In 1965-67 samples were collected in seven-ten days intervals from open water and sediment to study the *Crustacea*, *Chironomidae* and *Oligochaeta* fauna at low, mean and high water discharges. During the vegetation period when the water level was low for a long period the side

arms became lentic, which made the development of a rich fauna possible. The dynamic side arm - main arm connection is a determinant factor in the life of rivers.

O.N./A.J.

407. Bothár, A.

Horizontal investigations of the plankton of the Danube from Rajka to Turnu Severin (1850-93 river km). Danub. Hung. LXVIII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 16: 157-162.
1974.

Plankton samples were collected on a boat expedition from Rajka to Turnu Severin between 19-25. July, in 1971. The qualitative and quantitative analysis of samples from 36 sites were presented together with the relative abundance of *Crustacea* plankton (*Cladocera* and *Copepoda* species) along this stretch of the Danube.

O.N.

408. Bothár, A.

Planktonic Crustacea community changes in the Danube at Göd (1668 river km). Danub. Hung. LXXVIII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 17: 137-146.
1975.

The article summarises the results of weekly data collections from years with different water level fluctuations, 1965-67. and in 1971-73. The occurrence of the 71 *Crustacea* species followed three distribution patterns. The annual abundance of most species had two peaks. The steady connection between the main arm and the floodplain during the great flood in 1965 caused an increase in their individual numbers and changed the species composition.

O.N./A.J.

409. Bothár, A.

The investigation of planktonic crustaceans in the Danube between Szob and Nagymaros. Danub. Hung. LXXXVIII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 20-21: 249-259.
1978-1979.

Monthly sampling was carried out at three localities along a 50 km Danube section (1707, 1695, 1656 river km) from the right and the left bank and the main current. 25 *Cladocera* and 14 *Copepoda* species were found. Maximal individual numbers occurred in May. There was no considerable longitudinal difference in the distribution of crustaceans along this relatively short section.

There were often higher individual and egg numbers and a higher percentage of adults near the banks than in the main current indicating the importance of natural bank sections.

O.N./A.J.

410. Bothár, A.

Depth-dependent distribution of planktonic crustaceans in 1980-81. (in German)
23. Arbeitstagung der IAD. Wien. Wissenschaftliche Kurzref., 120-124.
1982.

Weekly samples were collected from the surface and the bottom of the Danube at Göd (1669 river km) in 1981-82. There were differences between the two layers especially during steady low or mean water periods, when the crustacean communities in the lower layer were very abundant.

O.N./A.J.

411. Bothár, A.

The presence and abundance of planktonic Crustacea species in the Hungarian Danube section between 1965 and 1985. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 283-286.
1985.

Samples were collected weekly at Göd (1669 river km) from 1965 to 1985. 78 crustacean taxa were positively identified from them. The main reason for the changes in the species composition and their individual numbers was the intensive eutrophication of the Danube especially in the 1980's. The annual fluctuation in abundance and the changes in the species composition were mainly determined by the actual hydrological conditions and water temperature.

O.N./A.J.

412. Bothár, A.

Population dynamics and estimation of production in Bosmina longirostris (O.F.Müller) in the River Danube.
Hydrobiologia, 140: 97-104.
1986.

Plankton samples were collected weekly in 1981-82. The analysis of the population dynamics of *Bosmina longirostris* was carried out. The estimation method for secondary production designed for standing waters was adapted to river conditions. In the River Danube the standing crop and production values were smaller, while fecundity, P/B values were higher and the turnover time was shorter than in standing waters.

O.N./A.J.

413. Bothár, A.

The estimation of Acanthocyclops robustus (G.O. Sars) production in the Danube. (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 339-343.
1987.

The production of *Acanthocyclops robustus* was estimated by using the growth increment summation method on daily-weekly samples from the Danube at Göd (1169 river km) and the laboratory investigation of their development. More than 50 % of the total production was from copepodits. Egg production was very low (7 %) mainly because of the high mortality of adult females. In the river the productivity of *Copepoda* species was smaller than that of the *Cladocera* species first of all due to their longer ontogenesis.

O.N./A.J.

414. Bothár, A.

The estimation of production and mortality of Bosmina longirostris (O.F.Müller) in the River Danube.
Hydrobiologia. 145: 285-291
1987.

The produced and eliminated biomass of *Bosmina longirostris* in the River Danube was estimated from daily-weekly samples collected at Göd (1669 river km) in 1982. An attempt was made to calculate the rate of immigration and mortality, taking into consideration the hydrological characteristics of the river. Production and immigration influenced the population changes to about the same extent.

O.N./A.J.

415. Bothár, A.

Results of long-term zooplankton investigations in the River Danube, Hungary.
Verh. Internat. Verein. Limnol., 23: 1340-1343.
1988.

Crustacean samples were collected in every alternate week at Göd (1669 river km) from 1965 to 1986. The species composition, abundance, horizontal transect and vertical distribution was analysed. The available knowledge on the production of the two dominant species was also summarised in the article. Besides the general relationships that are also valid in standing waters, in rivers hydrographic properties exert partly restrictive, partly transforming the influences on the composition, abundance and productivity of the communities. The strong possibility of increasing eutrophication in the River Danube caused by the construction of the new river barrage urges the development of a committed environmental policy.

O.N./A.J.

416. Bothár, A.

Need for Scientific and Political Co-operation in the Danube Basin. Water Problems due to Economic and Political Interest.
In: Sleicher, K. (ed.): Pollution Know No Frontiers. A Reader APWPA Book. Paragon House. New York, 1-17.
1988.

After the general geographical description of the Danube the author dealt with the human impact on the river, water utilization and pollution problems. Possible future ecological and water supply problems caused by the Gabcikovo-Nagymaros Project and the international struggle to estimate their effect and avoid any detrimental effects are also analysed in detail.

O.N.

417. Bothár, A.

Qualitative and quantitative plankton studies in the River Danube at Göd (1669 riv. km Hungary) II. Zooplankton. (in German)
30. Arbeitstagung der IAD, Zuoz - Switzerland
Wissenschaftliche Kurzref., p: 25-28.
1994.

Zooplankton samples were collected weekly in 1991-93. Altogether 36 *Cladocera* and *Copepoda* species were found. Both the number of species and individuals decreased as compared to the late 1980's. Changes in the species composition were also indicated by the sporadic occurrence of the previously dominant *Bosmina longirostris.*

A.J./B.Á.

418. Bothár, A. - Dvihally, Zs. - Kozma, E.

Hydrobiological investigations of the Danube between Nagymaros and Megyer (1695-1656 river km). Danub. Hung. LVII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 13: 5-18.
1971.

The water chemistry and the *Crustacea* plankton were monitored monthly at four sampling sites between Nagymaros and Megyer in the Szentendre and the Vác Danube arms in 1967-68, during a year with an average water level fluctuation. Three new species for the Hungarian Danube section were found besides 24 other species. The chemical changes were connected with the actual hydrological conditions and the assimilation of algae. There were no important chemical or zoological differences between the two arms.

O.N./A.J.

419. Bothár, A. - Kiss, K. T.

Phytoplankton and Zooplankton (Cladocera, Copepoda) relationship in

the eutrophicated River Danube.
Hydrobiologia, The Hague, 191: 165-171.
1990.

The seasonal variation in the individual numbers and biomass of phyto- and zooplankton and primary and secondary production was studied in the River Danube (1669 river km) in 1981. Samples were taken weekly. The daily mean gross primary production was 970 mg C m^{-3} d^{-1} and the net production was 660 mg C m^{-3} d^{-1}. On the basis of the intensity of the primary production, the river could be categorized as eu-polytrophic or hypertrophic. The ecological efficiency between the phytoplankton and the crustacean zooplankton was very low 0,03 %.

O.N./A.J.

420. Bothár, A. - Ponyi, J.

Informatory investigations about qualitative and quantitative conditions of the crustacean Plankton of the Danube section near Alsógöd (Hungary). Danub. Hung. XLVII.
Annal. Biol. Tihany, 35: 117-126.
1968.

55 crustacean taxa were found at Göd (1669 river km) in weekly samples taken from 1956 to 1966. Two new species for the Danube and 15 for the Hungarian section were recorded. The detailed taxonomic analysis of 5 *Crustacea* species was also carried out. Species composition and abundance was mainly affected by the water level fluctuations especially in the great flood of 1965.

O.N./A.J.

421. Bothár, A. - Ráth, B.

Abundance Dynamics of crustaceans in Different Littoral Biotopes of the "Szigetköz" Side Arm System, River Danube, Hungary.
XXV. SIL International Congress. Barcelona. Abstracts, 509.
1992.

The effect of the water level fluctuation on submerged macrophytes in three side arms at different levels of the succession was investigated. The distribution of *Cladocera* and *Copepoda* species in the water column (open water), the benthal region and the macrophyton stands was also monitored.

O.N.

422. Bothár, A. - Ráth, B.

Abundance dynamics of crustaceans in different littoral biotopes of the "Szigetköz" side arm system, River Danube, Hungary.
Verh. Internat. Verein. Limnol. 25: 1684-1687.
1994.

The macrophyton communities and the abundance dynamics of crustaceans was investigated in different littoral, bottom, and open water habitats of three genetically and morphologically different water bodies of the Szigetköz region in 1991. The side arms were in a dynamic connection with each other. Several mozaic-like habitat types could be described in each of the side arms according to their crustacean communities. Depending on the water level fluctuations, the composition and number of crustacean communities were strongly influenced by the duration and intensity of hydrological changes.

A.J/B.Á.

423. Buczkó, K. - Ács, É.

Preliminary studies on the periphytic algae in the branch-system of the Danube at Cikolasziget (Hungary).
Stud. Bot. Hung., 23: 49-62.
1992.

Periphyton samples were collected mainly from the Cikolaszigeti side arm system and in some cases from the Ásványráró side arm system in 1991-92 monitoring low water periods, when there was no connection between the side arm and the main arm and mean water periods, when the river broke over the river walls to connect with the side arms.
Chlorophyll-a concentration, pH, conductivity, total hardness and water temperature were measured. Periphyton was collected from different substrates: boats, stones, branches, submerged macrophytes, reed, sedges, amphibious bistort, great yellow cress and the surface of the clay bottom. Differences according to the substrate and sampling sites were analysed.
190 periphytic species have been found so far (*Cyanophyta:* 13, *Euglenophyta*: 6, *Chromophyta*: 88 out of which 83 were *Bacillariophyceae*, *Cryptophyta*: 10, *Chlorophyta*: 73). 193 planktonic species were found in the Cikolaszigeti side arm system with a different composition of phyla (*Cyanophyta*: 7, *Euglenophyta*: 7, *Chromophyta*: 68 out of which 53 were *Bacillariophyceae*, *Cryptophyta*: 15; *Chlorophyta*: 96).
The algal composition and species richness of the periphyton was transitory between river and lake periphyton. Periphyton samples from the same site showed greater similarity than samples collected from the same substrate. The dominant factor determining the structure of the periphyton seemed to be current velocity. Under similar current conditions periphyton of similar composition usually developed.

G.P.

424. Buczkó, K. - Ács, É.

Algological studies on the periphyton in the branch-system of the Danube at Cikolasziget (Hungary).
Verh. Internat. Limnol. Ver., (in print).
1993.

Periphyton samples were collected mainly from the Cikolaszigeti side arm

system and in some cases from the Ásványráró side arm system in 1991-92 monitoring low water periods, when there was no connection between the side arm and the main arm and mean water periods, when the river broke over the river walls to connect with the side arms.
Chlorophyll-a concentration, pH, conductivity, total hardness and water temperature were measured. Periphyton was collected from different substrates: boats, stones, branches, submerged macrophytes, reed, sedges, amphibious bistort, great yellow cress and the surface of the clay bottom. Differences according to the substrate and sampling sites were analysed.
190 periphytic species have been found so far (*Cyanophyta*: 13, *Euglenophyta*: 6, *Chromophyta*: 88 out of which 83 were *Bacillariophyceae*, *Cryptophyta*: 10, *Chlorophyta*: 73). 193 planktonic species were found in the Cikolaszigeti side arm system with a different composition of phyla (*Cyanophyta*: 7, *Euglenophyta*: 7, *Chromophyta*: 68 out of which 53 were *Bacillariophyceae*, *Cryptophyta*: 15; *Chlorophyta*: 96).
The algal composition and species richness of the periphyton was transitory between river and lake periphyton. Periphyton samples from the same site showed greater similarity than samples collected from the same substrate. The dominant factor determining the structure of the periphyton seemed to be current velocity. Under similar current conditions periphyton of similar composition usually developed.

G.P.

425. Copp, G. - Guti, G. - B. Rovny, J. - J. Cerny.

Hierarchal analysis of habitat use by 0+ juvenile fish in the Hungarian/Slovak floodplain of the River Danube.
Env. Biol. fishes 40: 329-348.
1993.

To address the lack of information on the distribution and habitat use of 0+ juvenile fishes in the Kisalföld flood plain of the middle River Danube between Hungary and Slovakia, we undertook the first cross-border ichthyological investigation, examining three levels of ecological perception (hydrosystem, macrohabitat, microhabitat) during August 1992 using Point Abundance Sampling by electrofishing. At the hydrosystem level, 25 species of 0+ fish were captured in the 730 point samples in Hungary and 440 in Slovakia. A typology of macrohabitats using centred and normalised PCA revealed three groups of sites: 1) lotic channels, weirs and wing-dams; 2) partially-abandoned channels; 3) abandoned channels; the results corroborated our assumption that weirs represent a lotic refuge for rheophilous 0+ fishes during late summer. At the microhabitat level, an empirical model of microhabitat use was generated using CCA and association analysis. Water velocity and transparency were the most influential variables, with the 0+ juveniles ordinated along the first canonical axis.

G.G./B.Á.

426. Csanády, M.

The copper and zinc content of surface waters. (in Hungarian)
Hidrol. Közl., 51: 91-93.
1971.

The heavy metal concentration, first of all copper and the zinc content of surface waters was mapped from 1966 to 1969. Copper concentration in the Danube continuously decreased downstream from when it first entered Hungary.
The great fluctuation near the border indicated the effect of industrial centers (Vienna, Bratislava) just upstream. The distribution of zinc was more uniform.

O.N./B.Á.

427. Csányi, B.

Hydrobiological investigations in the water bodies of the Szigetköz. Macrozoobenthos. (in Hungarian)
Műhely (Suppl.). Geographical Research Institute of the Hungarian Academy of Sciences.
1989.

The author classified the surface waters of the Szigetköz and its macroinvertebrate communities using multivariant methods (cluster analysis, ordination). The Danube, the Moson Reach, the actual floodplain and the outer part of the floodplain isolated from the main arm by flood protection dikes including oxbow lakes and marshes could be easily distinguished on the basis of their macrozoobenthos communities.

G.P.

428. Csányi, B.

The macrozoobenthon community of the Upper Hungarian Danube. (in German)
30. Arbeitstagung der IAD, Zuoz - Switzerland 1994. Wiss, Kurzref. 74-78.
1994.

Kicking and dredging sampling methods used for the study of the macrozoobenthon community in the Hungarian Upper Danube between Rajka and Budapest have resulted in similar conclusions. The Szigetköz stretch of the river has a nearly indentical, typical rheophilous fauna with a relatively low species number. A gradual increase was observed in the taxon number downstream until Budapest where the richest community was detected. A great number of new faunistical data concerning the mollusc taxa along the river section were collected especially for the profundal region of the Danube using the dredge sampling technic.

CS.B./B.Á.

429. Csányi, B. - Németh, J. - Gulyás, P.

Comparative hydrobiological investigations in the Ásványráró side arm of the Danube in 1984. I. Dissolved oxygen content and photosynthetic oxygen production. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 190-193. 1985.

The phyto- and zooplankton, the horizontal and vertical distribution of the dissolved oxygen concentration in the water and the intensity of the photosynthetic oxygen production were investigated at several sampling sites in the Ásványráró side arm system on 5-6 September and 23-24 October in 1984.
There were three typical vertical layers according to the vertical distribution of the dissolved oxygen concentration. The dissolved oxygen concentration, the width of the supersaturated layer, the phytoplankton biomass and the chlorophyll-a concentration decreased towards the closed upper end of the side arm. The total oxygen production at the lower part of the side arm was 12.9 g m^2 day^{-1} in September and 3.4 g m^2 day^{-1} in October.

G.P.

430. Daubner, I.

The biological aspects of the construction of river barrages on the Danube. (in Hungarian)
Biol.Oszt.Közlem., Hungarian Academy of Sciences. 24: 57-65.

The article briefly summarizes the results of the environmental impact study commissioned by HYDROCONSULT, the Czechoslovakian governmental planning company for water regulation. Predictable changes in the surface waters, riparian forests and wetlands are discussed. Most of them were considered unfavourable, several possibilities for the mitigation of the damages are also listed. The chapters of BIOPROJECT, the environmental impact study, are acquainted as well.

B.Á.

431. Dinka, M.

Preliminary studies about the heavy metal content of the sediment in the dead arm of Szigetköz side arm system. (in German)
30. Arbeitstagung der IAD, Zuoz - Switzerland 1994, Wiss. Kurzref. 331-335.
1994.

The heavy metal content of the sediment was investigated in one of the side arms of the Cikola side arm system in the Szigetköz region, which had been separated from the man arm for a longer period. The methodology made measurements of 1-5 cm layers down to a maximal

depth of 30 cm possible. The following metals were determined: Cd, Co, Cr, Cu, Mn, Ni, Pb, Zn. Their concentrations varied between the following ranges: 5-7 μg/g (Co), 3,5-9,3 μg/g (Co), 20,6-39,8 μg/g (Er), 21,4-41,0 μg/g (Cu), 169-644 μg/g (Mn), 14,9-32,2 μg/g (Ni), 40,2-97,8 μg/g (Pb), 47,3-210,0 μg/g (Zn). Tendencies could be recognized in the vertical distribution of certain metals.

B.Á.

432. Dudich, E. - Lászlóffy, W.

Several important pieces of information on the Hungarian Danube section. (in German)
Rotaprint. Budapest, 1-32.
1960.

The first part of the article written by Lászlóffy describes in general terms and in greater detail the hydrography, physical and chemical conditions, floods, floodprotection, contemporary administrative system and research of the Hungarian Danube section. The second part written by Dudich contains detailed water chemical analysis (especially at Ásványráró and the Moson Reach), a botanical, zoological introduction to the Danube with the description of the sites and their saprobic conditions. Detailed maps show areas such as the Bratislava-Gönyű section before and after the regulation of the section.

O.N.

433. Dvihally, Zs.

Optical investigations in the Váci arm of the Danube at Göd. Danub. Hung. II. (in Hungarian)
Hidrol. Közl., 39: 357-364.
1959.

There were great fluctuations in the turbidity of the Danube, during the low water period at the end of the winter it was at least 10, and sometimes exceeded being a 100 times more turbid than it was in the small flood in spring. The selective absorption of the water was only moderately dependent on the degree of turbidity. It made life for the potamoplankton even more difficult as its ability to photosynthesize is restricted as the photosynthetically useful part of the spectrum cannot penetrate water as deep as the part useless for plant life can.

O.N.

434. Dvihally, Zs.

The dissolved oxygen concentration, suspended matter content and turbidity of the upper layer of the Danube in 1959. Danub. Hung. XV. (in German)
Arch. f. Hydrobiol. Suppl. 27. Donauforschung, 72-84.
1962.

The dissolved oxygen concentration, suspended organic matter and turbidity of the main arm and the side arm of the Danube at Göd (1669 river km) were investigated in 1959. There was an inverse relationship between the oxygen concentration and the water level. The changes in the water chemistry and the temperature were more pronounced in the side arm than in the main arm. When the side arm was separated from the main arm the proliferation of the algae lead to the increase of the transparency of the water, the amount and the organic matter content of the suspended matter. The oxygen concentration could also on occasions reach supersaturation during the day.

O.N.

435. Dvihally, Zs.

The Hungarian Danube section. (in German)
In: Knie, K.: Physik, Chemie, Radioaktivität und Stoffhaushalt der Donau. - In: Liepolt, R. (Red.): Limnologie der Donau 2. Stuttgart. 66-88.
1966.

The main hydrographical and water discharge characteristics of the 417 km Hungarian Danube section is described, a detailed water chemistry analysis of ten sampling sites along the Rajka-Mohács section is summarized in tables.

O.N.

436. Dvihally, Zs.

On the oxygen content and the primary productivity of the Danube. Danub. Hung. XCVIII. (in German)
Arch. f. Hydrobiol. Suppl. 52. Donauforschung, 4: 350-370.
1981.

The article summarizes the dissolved oxygen concentration and the biological oxygen production along the whole Danube on the basis of her work on the Hungarian section and on scientific literature.
Supersaturation, which had been common in earlier years, became rarer by the 1970's. The daily fluctuation of the primary production and the dissolved oxygen concentration decreased in this order: oxbow lake > slowly flowing side arm > main arm. A lower level of primary production along the German - Czech section increased again downstream.
Data on the maximal values of the surface primary production and those of the total water column, the seasonal and the annual variation of the dissolved oxygen saturation between 1965 and 1979, the Danube in the Szigetköz and the Moson Reach were also included. The periphyton of the riparian and the more or less separated side arms was an important primary producer.

O.N.

437. Dvihally, Zs. T. - Ertl, M. - Kiss, K. T. - Schmidt, A. - Stefkova, N.

Oxygen budget related investigations in the Middle Danube I. (in German)

23. Arbeitstagung der IAD. Vienna. Wissenschaftliche Kurzref., 8-15.
1982.

Water chemistry, algological and primary production measurements were carried out in the Rajka (1848 river km), Gabcikovo (1820 river km), Göd (1669 river km) and Baja (1481 river km) transects in May, July, August, September and October in 1981.
The water level (cm), discharge (m^3 sec^{-1}), temperature (C°), dissolved oxygen concentration (mg l^{-1}), oxygen saturation (%), total and net primary production, respiration (g O_2 m^{-3} day^{-1}), pH, conductivy (μS), suspended matter content (mg l^{-1}), COD, BOD (mg l^{-1}), algal individual number (ind l^{-1}) chlorophyll-a concentration (mg m^{-3}) were recorded.
The trophic level of the Danube undoubtedly increased along the (Bratislava) Rajka-Budapest section. In low water periods both the individual number of algae and the chlorophyll-a concentration increased by 50-150 %.

O.N.

438. Dvihally, Zs. T. - Ertl, M. - Kiss, K. T. - Schmidt, A.

Oxygen budget related investigations in the Middle Danube II. (in German)
24. Arbeitstagung der IAD. Szentendre. Wissenschaftliche Kurzref., 1: 9-12.
1984.

Water chemistry, algological and primary production measurements were carried out in the Rajka (1848 river km), Göd (1669 river km) and Baja (1481 river km) transects in June, August, September and October in 1982.
The water discharge (m^3 sec^{-1}), temperature (C°), dissolved oxygen concentration (mg l^{-1}), oxygen saturation (%), total and net primary production, respiration (g O_2 m^{-3} day^{-1}), algal individual number (ind l^{-1}) chlorophyll-a concentration (mg m^{-3}) were recorded.
The trophic level of the Danube undoubtedly increased along the (Bratislava) Rajka-Budapest section. In low water periods both the individual number of algae and the chlorophyll-a concentration increased by 50-150 %.

O.N.

439. Dvihally, Zs. - Kozma, E.

Chemical investigations on the Hungarian section of the river Danube. Danub. Hung. V.
Ann. Univ. Sci. Budapest. Sect. Biol., 3: 145-154.
1960.

A synchronized complex chemical and biological survey was organized along the 320 km Danube section between Komárom and Mohács from 30 September to 5 October in 1958. The 2622 data represented well the autumnal river and the tendencies of the spatial-temporal changes.

O.N.

440. Dvihally, Zs. - Kozma, E.

A year long investigation of water chemical parameters in the Danube at the Hungarian Danube Research Station at Alsógöd. Danub. Hung. XXI. (in German)
Arch. f. Hydrobiol. Suppl. 27. Donauforschung, 365-380.
1964.

Typical water levels were characterized chemically in the main arm and the side arm of the Danube at Göd (1669 river km) in 1958-59. The seasonal changes were important, the spatial differences were only secondary. Though the absolute quantity of the ions changed during the year their ratio remained nearly the same. The total salt concentration of the Danube could be considerably higher than the suspended matter content.
At low water periods the side arm is separated from the main arm. Besides evaporation, biologically induced chemical processes also became important. Floods brought these conditions to an end by mixing the water of the side arm and the main arm.

O.N.

441. Dvihally, Zs. - Kozma, E.

New data on the hydrochemistry of the Danube on the basis of simultaneous investigations. Danub. Hung. XXXI. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol. 8: 63-68.
1966.

Samples were collected every month from twelve sites along the Hungarian Danube section: Ásványráró (1816 river km), Gönyű (1788 river km), Neszmély (1749 river km), Esztergom (1719 river km), Vác (1684 river km), Budapest (1647 river km), Ercsi (1614 river km), Dunaújváros (1581 river km), Dunaföldvár (1562 river km), Paks (1531 river km), Baja (1481 river km), Mohács (1448 river km) every month between 7 June, 1960 and 28 June, 1961.
The temperature of the water, alkalinity, hardness (carbonate, total, Ca, Mg), the Ca^{2+}, Mg^{2+}, HCO_3^- and Cl^- concentration were also measured.

O.N.

442. Forró, L. - Gulyás, P.

Eurytemora velox (Lilljeborg, 1853) (Copepoda, Calanoida) in the Szigetköz region of the Danube.
Miscel. Zool. Hung. Budapest, 7: 53-58.
1992.

Euritemora velox (Lilljeborg), a *Copepoda* species was found at six localities in the Szigetköz region between June and September in 1991. This was new species for Hungary as this planktonic crustacean had previously only been recorded from Scandinavia, Western-Europe, the Danube Delta and the European part of Russia.

G.P.

443. Frank, C. - Jungbluth, J. - Richnovszky, A.

The molluscs of the Danube from the Black Forest to the Black Sea. (in German)
AKAPRINT, Budapest, 1-142.
1990.

The *Mollusca* fauna of the Danube (61 snails and 67 mussels) from the Black Forest to the Black Sea was described. The work of several decades is grouped according to the individual countries. The hydrography, climatology and water chemistry of the Danube are also discussed before the taxonomic chapter. The ecological requirement of the species, zoogeography and habitat descriptions completed the description of the species.

O.N.

444. Gulyás, P.

Daily zooplankton studies in the Ásványráró side arm of the Danube during the summer of 1985. (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 123-126.
1987.

Zooplankton samples were collected daily at one site of the Ásványráró side arm system between 20 June and 17 September in 1985. The water discharge of the Danube fluctuated between 1530 and 7090 $m^3 s^{-1}$.
The following questions were raised:

-- What kind of species composition and relative abundance developed in the side arm, which was separated from the main arm?
-- How did it change over a period of time?
-- What relationships were there between the structure of the zooplankton and the changing hydrological conditions?

Lentic conditions with an increasing number of species and individuals characterized the side arm when there was no connection with the main arm. The increase of the current velocity greatly decreased the previous parameters. Besides the annual changes the structure of the zooplankton was determined first of all by the water discharge. Most species found were common, and characteristic for slow-moving, eutrophic rivers. The individual number fluctuated between 1 and 6321 ind l^{-1}.

G.P.

445. Gulyás, P.

Rotatoria and Crustacea investigations in water bodies of the Szigetköz. (in Hungarian)
Műhely. Geographical Research Institute of the Hungarian Academy of Sciences. Budapest, 1-10.
1989.

The author studied the *Rotatoria, Cladocera* and *Copepoda* fauna of all

the water types in the Szigetköz region. The compiled species lists provide a basis for the follow up of the changes in the area as it documented the status of the investigated groups.
The different water bodies were also classified on the basis of their faunal structure using multivariant mathematical methods (cluster analysis). The sampling sites were compared in pairs by the Jaccard similarity index. There was no clear distinction between different water types but the indication of the presence or absence of the species was recognizable.
Canals and oxbow lakes outside the floodprotection dikes were in one group together with the transect of the Danube at Rajka, the catch drain and the upper part of the Moson Reach. The side arms from the northern and southern part of the floodplain were in another group. The two side arms in the middle of the side arm system belonged to a third category. After the elaboration of the statistical method it became possible to distinguish and characterize different water bodies.

G.P.

446. Gulyás, P.

Zooplankton studies in the water bodies of the Szigetköz. Part I. The Rotatoria fauna. (in German)
28. Arbeitstagung der IAD. Varna. Wissenschaftliche Kurzref., 15-18. 1990.

99 *Rotatoria* species were found at 79 sites in the Szigetköz region. Some of them are common in the surface waters of Hungary, others are rare. The different water bodies could easily be distinguished with their *Rotatoria* plankton.
The least species rich areas were the Danube at Rajka, Dunaremete, Medve and downstream at the mouth of the Moson Reach. Only 37 species were collected from those areas. On the other hand a total of 61 species occurred in the side arm systems. Their presence and dominance indicated two different areas within the floodplain. The northern part was less species rich than the southern, where more rare species could be found.
Water bodies outside the floodprotection dikes were the most species rich with a total number of 76 exclusively including a number of rare species.
The *Rotatoria* fauna of small lakes, mort lakes, oxbow lakes and marshes with extensive macrophyton stands and infrequent water exchange distinguished these water bodies from the other water types in the area.
The author summarized his results in two statements:
1. The investigated water bodies could be characterized according to their Rotatoria fauna.
2. The presence of rare and protected species proved that the water bodies of the Szigetköz should be strictly protected.

G.P.

447. Gulyás P.

Zooplankton studies in the water bodies of the Szigetköz. Part II. The Cladocera and Copepoda fauna.
28. Arbeitstagung der IAD. Varna. Wissenschaftliche Kurzref., 19-21.

1990.

49 *Cladocera* and 23 *Copepoda*, came to a total of 72 *Crustacea* taxa which were found at 79 sampling sites. The different water bodies were characterized by their fauna. The least species rich areas were the main arm of the Danube, the Moson Reach and the Rába. Altogether only 34 crustacean species were found in them probably due to their higher velocity. In spite of this, several species rare in Hungary were also recorded.
43 species were collected from the side arm systems. Species composition differed between individual waters, which could also be distinguished on this basis.
The richest areas were outside the floodprotection dikes due to these having the greatest variety of the habitats with a total number of 63 species. The dominant species were more or less the same as in the other water bodies but nearly exclusively these waters hosted most of the rarer species.
With the help of the Jaccard similarity function the cluster analysis separated the sampling sites into three categories: main arm, side arm system, water bodies outside the floodprotection dikes with rich macrophyton vegetation.
Protected areas should be designated to save the rare *Crustacea* species in the Szigetköz region.

G.P.

448. Gulyás, P.

Saprobiological investigations of the 1848-1659 river km stretch of the Danube and its backwaters.
29. Arbeitstagung der IAD. Kiev. Wissenschaftliche Kurzref., 146-150. (in German)
1991.

The author carried out saprobiological surveys along the Danube between Rajka and Budapest and near the mouth of twelve tributaries. Saprobity was calculated by the Pantle-Buck method. The degree of organic pollution was practically constant between Rajka and Budapest during floods. If the water discharge decreased at the mean water level the α-β-mesosaprobic status slightly improved along the section. It was β-mesosaprob between Esztergom and Budapest. The natural self-purification of the Danube upstream Budapest was satisfactory with the exception of the late autumn period. The Rábca and the Moson Reach was α-mesosaprob throughout the year, while the side arm systems in the Szigetköz resembled the Danube saprobiologically.
The Táti stream was strongly polluted all year round. The polluting effect of the Táti stream and the Moson Reach could be detected in the Danube, too. The organic pollution of the side arm systems in the Szigetköz was moderate, their biological water quality was acceptable.

G.P.

449. Gulyás, P.

Studies on Rotatoria and Crustacea in the various water bodies of Szigetköz.
Limnologie Aktuell. Deutschland, (in press).
1993.

Samples were collected at 94 sites of differing water types in the Szigetköz region. 120 *Rotatoria*, 56 *Cladocera* and 29 *Copepoda* species were recorded.
From the literature the author recognized that there had been no joint *Rotatoria* - *Cladocera* - *Copepoda* investigations in the area. There had been no literature on these animals besides his own earlier works.
The zooplankton communities of the main arm and the side arm systems of the Danube, the water bodies outside the floodprotection dikes, the Rába and the Moson Reach were evaluated according to their species composition.
Many rare species were found, *Eurytemora velox* (Lilljeborg), *Calanoida* had not previously been recorded in Hungary. The following areas could be distinguished according to the presence, absence and dominance of zooplankton species:
- the main arm of the Danube,
- side arm systems of the floodplain,
- gravel pits,
- regulated canals,
- macrophyton-poor canals,
- macrophyton-rich canals,
- marshes, mort lakes.

The article ended with a species list indicating the distribution as well.

G.P.

450. Gulyás, P.

Studies on the Rotatorian and Crustacean plankton in the Hungarian section of the Danube between 1848,4 and 1659,0 river km.
Limnologia Aktuell. Deutschland, (in press).
1993.

The *Rotatoria* and *Crustacea* plankton of the Danube was investigated at eleven sites from Rajka to Budapest between 1987 and 1991. After the review of the literature the author concluded that only a few people had investigated the *Rotatoria* and *Crustacea* plankton along this upper Danube section.
Altogether 95 taxa were found, 54 *Rotatoria*, 26 *Cladocera* and 15 *Copepoda* species. The *Rotatoria* species dominated the communities. Only the earlier developmental stages of *Copepoda*, nauplius and copepodit larvae occurred in similar individual numbers.
The individual number of the zooplankton fluctuated between 1 and 104 in a litre, the dry weight of the biomass between 0.4 and 35.2 mg l^{-1}. Both parameters clearly increased from Rajka to Budapest.
The effect of polluted tributaries led to a decrease in the number of species, primarily in low water periods. There were no easily definable subsections along the investigated stretch.

The quantitative characteristics of the zooplankton considerably increased after 1987.

G.P.

451. Gulyás, P.

Changes in the planktonic Rotatoria and Crustacea community along the Rajka - Komárom section of the Danube due to the Slovakian diversion of the river.
30. Arbeitstagung der IAD, Zuoz - Switzerland 1994. Wiss, Kurzref. 49-52. 1994.

The Slovakian diversion of the Danube in the head-race channel of the Gabcikovo River Barrage resulted in a strong alteration of the zooplankton community after the end of 1992. Lower number of species and decreased biomasses were observed in the water body of the old Danube bed. The community structure of the *Rotatoria* and *Crustacea* zooplankton recovered below the barrage. Both the individual and species numbers increased slowly downstream.

G.P./B.Á.

452. Gulyás, P. - Bereczky, M. Cs.

Zooplankton studies in a side arm of the Danube in the Szigetköz at Ásványráró. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 291-295. 1985.

Zooplankton samples were collected from nine sites in the Ásványráró side arm between 6 September and 24 October in 1984. The taxonomic distribution of the 141 species was the following: 2 *Amoeba*, 10 *Testacea*, 1 *Heliozoa*, 80 *Ciliata*, 27 *Suctoria*, 27 *Rotatoria*, 15 *Cladocera* and 5 *Copepoda* species.
A comparison is made between the side and main arms using their Rotatoria fauna. A cluster analysis was also carried out, the saprobity, similarity indexes and the spatial-temporal distribution of the animals is also presented.

O.N.

453. Gulyás, P.- Németh, J. - Csányi, B.

The hydrobiological investigation of the side arm systems of the Danube in the Szigetköz. Wetlands, conservation, creation and restoration. (in German)
ÖKO-TEXT (Österreichische Gesellschaft für Natur- und Umweltschutz). Wien, 5/91:239-258.
1991.

The article summarized the results of the authors' floristic and faunistic research in the Szigetköz region between 1983 and 1989. The different water bodies in the area were classified on the basis of their phyto- and

zooplankton and macroinvertebrate communities with the help of multivariant mathematical methods. The description of the main water types is also supplemented with ichtyological data.

G.P.

454. Guti, G.

The population density of perch, *Perca fluviatilis* L., in the Cikola backwater system of the river Danube, Hungary.
Hydrobiologia 242: 195-198.
1992.

The number of perch *Perca fluviatilis* in the Cikola backwater system of the river Danube were estimated by mark-recapture technique using multiple fishing. Fish were caught by fyke nets and electrical fishing. The latter method was unselective for sex and the catch data could be used to correct the sex bias in the fyke net catches.

G.G./B.Á.

455. Guti, G.

Mortality and growth of perch *Perca fluviatilis L.* in a backwater system of the river Danube in the Szigetköz area. (in Hungarian)
Halászat. 85: 43-47.
1992.

High mortality and slow growing rates of perch, *Perca fluviatilis* in the Cikola backwater system of the river Danube were established in 1990. The environmental conditions of the branch system were not favourable for long life of the perch. The average length of the age groups was calculated from the radius of annuli of scales. The females' growth was faster from the 2+ age group than males' growth.

G.G./B.Á.

456. Guti, G.

Food of perch *Perca fluviatilis L.* in a backwater system of the river Danube in the Szigetköz area.
Halászat. 85: 182-185. (in Hungarian)
1992.

The analysed stomac contents of 294 specimens of perch *Perca fluviatilis* were collected in the Cikola branch system of the river Danube in the Szigetköz area between 1988 and 1990. Organisms of the litoral region were the most frequent in the food spectra of the investigated fish. The change of the food composition was determined not only by the seasonality but the water level and the size of the fish. In consequence of the conditions of the fluvial environment and the high density of the competitor cyprinids the limited food-sources of perch may be supposed.

G.G./B.Á.

457. Guti, G.

Mortality, growth and diet of perch *Perca fluviatilis L.* in the Cikola branch system of the Szigetköz area, River Danube.
Archiv für Hydrobiol. 128: 317-327.
1993.

Mortality growth and food composition were studied in perch of the Cikola branch system, River Danube, Hungary between 1988 and 1990. The instantaneous and annual mortality rates were high. Back-calculated lengths from the radius of scale annuli revealed that growth of perch was wery slow, but the rate of growth in females was greater than males, the difference being significant ($p = 0.01$) for age groups $\geq 4+$. Stomach contents revealed three main groups of charcteristic food components: fish, chirononida, planktonic organisms. The high mortality and slow growth of perch were attributed to the high density of zooplanktivour cyprinids and perch themselves, and the shortage of refuge for older age groups during the low water levels.

G.G./B.Á.

458. Guti, G.

Fisheries ecology of Danube in the Szigetköz floodplain.
Opuscula Zoologica, 26. Budapest (in press).
1994.

The paper presents the natural fish assemblages in the Szigetköz floodplain and summarises the most important human impacts on the fishes such as water management, the Gabcikovo river barrage system and fishery.

G.G./B.Á.

459. Guti, G.

Structure of juvenile fish assemblages at a low water level period in the Szigetköz floodplain of the Danube. (in Hungarian)
Halászat. 87: 39-44.
1994.

Structure and spatial distribution of juvenile fish assemblages were characterised using random point abundance sampling by electrofishing. 730 point samples were collected from 27 sites in the sidearms of the Szigetköz floodplain in 1992, before the operation of the Gabcikovo river barrage system. A typology of habitats using PCA revealed three groups of sites: 1) lotic parapotamon; 2) lentic parapotamon; 3) plesiopotamon.

G.G./B.Á.

460. Guti, G.

The investigation of juvenile fish assemblages on the floodplain of the Danube in the Szigetköz region. (in German)

Limnologische Berichte Donau 1994. Dübendorf. 1: 161-164.
1994.

In 1992, 730 point samples collected in the sidearms of the Szigetköz floodplain using random point abundance sampling by electrofishing, was recorded in a complex data base, which made the modelling of the spatial structure of the communities relatively easy. The body length distribution of the collected fish demonstrates that sampling was selective for individuals smaller than 7 cm, i.e. first of all for fry. The principal component analysis proved that the spatial distribution was partly determined by the geomorphology of the side arms but it depended first of all on the actual hydrological conditions. Rheophilic and semi-rheophilic species were caught around the cross-dams, semi-rheophilic ones at wider sections of the parapotamic branches. The juveniles of the relatively few limnophilic species were mostly found in separated, plesiopotamic side arms.

G.G./B.Á.

461. Hanzliková, G.

The dynamics of phytoplankton changes along the Czechoslovakian section of the Danube. (in German)
Acta. Rer. Natur. Mus. Nat. Slov. Bratislava, 19:57-77.
1993.

Samples were regularly collected at eight sites from Dévény (1878 river km) upstream to the Ipoly mouth (1712 river km) in 1961-65. It resulted in 300-330 water samples being taken in a year at Bratislava, 12-25 samples at other localities. The individuai number of algae was compared with the fluctuations in water discharge.
The article presents a clear picture of changes in the individual number of algae along the surveyed section, especially in Bratislava, during the period of study.

G.P.

462. Hock, B. - László, F.

The water quality of the Danube. (in Hungarian)
Vízügyi Közlemények. Budapest, 70: 532-546.
1988.

A comprehensive evaluation on the water quality of the Austrian and Hungarian Danube section and the Hungarian tributaries affected by the Gabcikovo Nagymaros River Barrage System is presented. It provides background information on the water quality of the river before the construction of the river barrage was finished. The annual 80 % permanence values of six Danubian transects (two along the Austrian section) and six Hungarian tributaries between 1981 and 1985 are provided.

The pollution of the sediment at bank-filtered wells within the area affected by the Gabcikovo Nagymaros River Barrage System was also evaluated and the sediment in the side arm systems in the Szigetköz was monitored at several sites.

G.P.

463. Holcik, J. - Bastl, I. - Ertl, M. - Vranovsky, M.

Hydrobiology and Ichtyology of the Czechoslovak Danube in Relation to Predicted Changes after Construction of the Gabcikovo Nagymaros River Barrage System.
Práce Laboratória Rybarstva a Hydrobiologie. Bratislava. 3: 19-158.
1981.

The authors predicted the hydrological changes along the Czechoslovak-Hungarian Danube section caused by the Gabcikovo Nagymaros River Barrage System.
The detailed hydrobiological analysis begins with the qualitative and quantitative estimation of the periphyton, phytoplankton, zooplankton, zoobenthos and the fish fauna in the different habitats (main arm, main current, littoral region, side arm systems etc.).
The second part describes the physical changes, the new environmental conditions and the predictions for the reservoir, the upstream and downstream section of the artificial river bed, the main arm and the floodplain.
According to the authors the biomass of the zooplankton would be 50 kg ha^{-1} in the main current, 15 kg ha^{-1} in the littoral zone and 178 kg ha^{-1} in the side arms, where strong currents occur infrequently.
The predictable hydrobiological effects of the river barrage system was definitely regarded as being harmful, especially the qualitative changes to the fish fauna. A disadvantage of the article is that the peak load operation was the only alternative it took into consideration.

G.P.

464. Horváth, L. - Bartalis, É. T.

Changes in the condition of the water quality along the Hungarian Upper Danube and in its side arm system in 1993.
30. Arbeitstagung der IAD, Zuoz - Switzerland 1994. Wiss, Kurzref. 132-135.
1994.

Characteristic water quality changes along the Danube section from rkm 1848 to 1806 and in the Szigetköz side arm system inside the flood protection dikes are described on the basis of 1993 examinations of the dissolved oxygen, total nitrogen, total phosphorous and chlorophyll a concentrations.
The dissolved oxygen content decreased the most unfavourable way in comparison to the original status from among the investigated parameters after the Gabcikovo River Barrage had been put into operation.

The lack of the dynamic water supply of the side arms had a negative influence on their oxygen budget and trophic relationships.

H.L./B.Á.

465. Horváth, L. - Pannonhalmi, M. - Várday, N.

Pollution and water quality changes on the Hungarian section of the Danube. (in Hungarian)
Vízügyi Közlemények, 4: 506-519.
1981.

Along the Hungarian Danube section the most polluted area was situated downstream of the mouth of the Vág (Hron). The salt concentration varied between 1 and 16 German degree at the border. It was of a calcium-magnesium-hydrogencarbonate dominance. The oxygen budget belonged to the II. class with a BOD_5 value of 4-7 g m^{-3} The chemical oxygen demand (COD) slowly increased (I-II. class). The inorganic nutrient (NO_3, NH_4) content slightly increased in time and further downstream the river, the sharpest increase was measured at the border. The orthophosphate pollution decreased downstream of the border.

O.N./B.Á.

466. Jancsó, K. - Tóth, J.

The fish fauna and fisheries of the Hungarian Upper Danube and its backwaters. (in Hungarian)
In: T. Dvihally, Zs. (ed.): A kisalföldi Duna-szakasz ökológiája. VEAB Publication. Veszprém, 162-191.
1987.

59 fish species were listed for the Hungarian Upper Danube together with the relative abundance of each. Detailed statistics of the fish catch are given for the main arm of the Danube, the Moson Reach, Rába, Rábca, Marcal and the side arms of the Danube (combined data) for each species. After the discussion on the effect of the natural environment on the fish fauna the connection between the status of the side arm systems in the Szigetköz region and the natural reproduction was analysed proving the importance of the area for the fish stocks of the Danube.

G.P.

467. Kertész, Gy.

The investigation of planktonic rotifers along a longitudinal transect of the Danube in Hungary. Danub. Hung. XLIII. (in German)
Opusc. Zool. Budapest., 7: 189-199.
1967.

A basic survey on the *Rotatoria* plankton of the Danube was made at 22 sites along the Rajka-Mohács section between 9 and 13 May in 1959. The qualitative and quantitative data (number of species and their individual numbers) from the longitudinal investigation are presented in tables.

Tycho- and euplanktonic species were shown separately.

G.P./O.N.

468. Kiss, K. T.

Changes of trophity conditions in the River Danube at Göd.
Ann. Univ. Sci. Budapest. Sect. Biol., 24-26: 47-59.
1985.

The author compared his weekly data from Göd from 1979-83 to Szemes's results which were gained from weekly or monthly sampling in Budapest and at Göd from 1956-63. By the end of the 1970s both the mean and the maximum individual number of algae were 5-10 times higher than at the beginning of the 1960s. This was basically caused by the river barrages constructed along the German and Austrian section of the Danube.

O.N./K.K.T.

469. Kiss, K. T.

Phytoplankton investigations in the Szigetköz section of the Danube in 1981-82. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenchaftliche Kurzref., 220-224.
1985.

The phytoplankton of the Szigetköz was investigated. Qualitative description with the total number of algae and the chlorophyll-a concentration was given for 8 sites [the main arm at Rajka (1848 river km), the Moson Reach at Dunakiliti, 3 sites at the Doborgazszigeti and a further 3 at the Cikolaszigeti side arm system].
Data was collected four times in June and July, 1981 and five times between June and October, 1982.

O.N.

470. Kiss, K. T.

Species of the Thalassiosiraceae in the Budapest section of the Danube. Comparison of samples collected in 1956-63 and 1979-83.
In: Richard, M.: Proceedings 8th Internat. Diatom. Symp., Koeltz. Koenigstein, 23-21.
1986.

Samples were collected either weekly or monthly in Budapest and at Göd in 1956-63 by Szemes and weekly at Göd between 1979 and 1983 by the author. Electron microscopic studies helped in the taxonomic analysis, which was focused on the *Centrales* species (*Bacillariophyceae*).
The species composition was practically the same but the relative abundance changed with the individual number increasing considerably.

O.N./K.K.T.

471. Kiss, K. T.

The qualitative investigation of the phytoplankton in the Danube at Göd (1669 river km) in 1986. (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 375-378.
1987.

The phytoplankton of the Danube at Göd (1669 river km) was investigated. Samples were collected weekly. There were three periods of high abundance in 1986. The individual number was 20-35, 35-75 and 30-55 million l^{-1} in April-May, July-August and September-October, respectively. The chlorophyll-a concentration reached 100- 230 mg l^{-1} and the water became polytrophic. The increased algae biomass had an unfavourable effect on the water quality.

O.N./K.K.T.

472. Kiss, K. T.

Phytoplankton studies in the Szigetköz region of the Danube in 1981-82. (in Hungarian)
In: T. Dvihally Zs. (ed.): A kisalföldi Duna-szakasz ökológiája. VEAB Publication, 77-101.
1987.

Qualitative and quantitative algae samples were collected from July to October in two consecutive years (1981-82) from the following sites: the main arm of the Danube at Rajka (1848 river km), the Moson Reach at Dunakiliti, the Doborgazszigeti and the Cikolaszigeti side arm system.
Species lists were presented. Diatoms dominated the vegetative period. The connection between current velocity and phytoplankton abundance was analysed together with the Danubian water discharge and the similarities of the phytoplankton communities. The trophity increased, the Danube in the Little Hungarian Plain was potentially polytrophic.

O.N.

473. Kiss, K. T.

Phytoplankton Studies in the Szigetköz Section of the Danube during 1981-1982.
Arch. f. Hydrobiol. 78. 2. Algol. Studies, 4: 247-273.
1987.

Samples were collected from the main arm of the Danube at Rajka (1848 river km), the Moson Reach at Dunakiliti, and at 3 sites within both the Doborgazszigeti and the Cikolaszigeti side arm system eight times from October 1981 to June 1982. At mean water level, when there was a connection between the main arm and the side arms the side arms could become eutrophic because of the decrease in the current velocity. Side arms have an important role in the natural purification of the water. Phytoplankton species lists include *Cyanophyta*, *Euglenophyta*, *Cryptophyta*, *Dinophyta*, *Chrysophyceae*, *Xantophyceae*, *Bacillariophyceae*, *Chlorophyceae*, *Conjugatophyceae* species.

The article also contains information on the phytoplankton composition, algal blooms, similarity of the phytoplankton communities, trophity, electronmicroscopic and morphological studies.

O.N.

474. Kiss, K. T.

The Morphology and Taxonomy of Stephanodiscus invisitatus Hohn et Hellerman (Bacillariophyceae).
Arch. f. Protistenkd., 135: 187-196.
1988.

This morphological and taxonomic study included a sampling site on the Moson Reach.

O.N.

475. Kiss, K. T.

Quantitative changes in the phytoplankton of the Danube at Göd (1669 river km) in the 1980's. (in German)
29. Arbeitstagung der IAD. Kiew. Wissenschaftliche Kurzref., 2: 68-71.
1991.

Samples were collected weekly at Göd in 1979-80. On the basis of the phytoplankton biomass the water of the Danube was eutrophic or polytrophic during the vegetation periods at low water levels at the end of the 1980s. The differences between the individual years correlated strongly with fluctuations in the water discharge.

O.N./K.K.T.

476. Kiss, K. T.

Algological results of the longitudinal transect studies on the Danube. (in German)
29. Arbeitstagung der IAD. Kiew. Wissenschaftliche Kurzref., 72-75.
1991.

The author compared two phytoplankton data series. The first was collected from the Danube Delta to Bratislava on an international Atomic Energy Agency expedition in 1978 the second during an International Danube expedition from the Danube Delta to Vienna in 1988 organized by the International Association for Danube Research. 166 and 128 species were recorded, respectively.
There is data from Gabcikovo in both series. The individual number of algae was compared between the sampling sites and the expeditions.

O.N.

477. Kiss, K. T.

Trophic level and eutrophication of the River Danube in Hungary.

Verh. Internat. Verein. Limnol., 25: (in press).
1993.

The author compared his weekly data from Göd from 1979-83 to Szemes's results, which were gained from weekly or monthly sampling in Budapest and at Göd from 1956-63. By the end of the 1970s both the mean and the maximum algal individual number were 5-10 times higher than at the beginning of the 1960s. This was basically caused by the river barrages constructed along the German and Austrian section of the Danube.
Lentic or near-lentic conditions developed in the reservoirs changing the structure of the phytoplankton and causing eutrophication.

O.N./K.K.T.

478. Kiss, K. T.

Qualitative and quantitative plankton studies in the River Danube at Göd (1669 riv. km Hungary) I. Phytoplankton.
30. Arbeitstagung der IAD, Zuoz - Switzerland. p: 25-28.
1994.

Phytoplankton samples were collected weekly from the streamline of the Danube upstream Budapest at Göd (1669 river km) in 1991-93.
The number of species fluctuated between 234 and 262 in the quantitative investigations.
Besides seasonal changes, the quantity of the phytoplankton was affected the most by the water dischange alterations. As a consequence a considerable amount of phytoplankton developed along the investigated section by the end of February - early March in 1992 and 1993. The number of individuals reached 40-120000 in a ml, the chlorophyll a concentration 100-160 μg/l indicating a hypertrophic water quality.
The extremely high phytoplankton abundance at the end of winter - early spring in 1993 and the early autumn proliferation of *Microcystis flos-aquae* was in connection with the functioning of the Hrusov Reservoir (C variant). In low water periods the water is warmer and more transparent in the reservoir than it would be in the original main arm. As a result there can be a greater and earlier peak of *Thallassiosiraceae* species, the dominant phytoplankton species in early spring. In summer and early awtumn the shallow water of the reservoir provides favourable conditions for the Proliferation of blue algae, in this case *Microcystis flos-aquae,* which leads to water blooms. The Hrusov Reservoir of the Gabcikovo River Barrage not only increase the eutrophication of the river but it also helps the proliferation of species which have unfavourable or dangerous effects on the water quality and the drinking water supply.

K.K.T./B.Á.

479. Kiss, K. T.

Trophic level and eutrophication of the River Danube in Hungary.
Verh. Internat. Verein. Limnol. 25: 1688-1691.
1994.

The aim of the paper is to describe the present state of the trophic relations and the eutrophication process by comparing data from the sixties and eighties.
The present potential trophic level of the River Danube is hypertrophic in Hungary on the basis of the plant nutrient supply. The actual trophic level is oligotrophic in winter, mesotrophic in high water periods and polytrophic-hypertrophic in low water periods in the growing season.
A great change in the phytoplankton density was registered during the middle of sixties and seventies. The phytoplankton density increased 5-10 times comparing the average and maximum values. There was no such a change in the nutrient supply. "Only" the transparency of the river became 2-3 times higher caused by the sedimentation effect of the power station reservoirs built in the German and Austrian section of the river. This transparency change is the main cause of the fast eutrophication of the River Danube.

K.K.T./B.Á.

480. Kiss, K. T. - Ács, É. - Kovács, A.

Ecological observations on Skeletonema potamos (Weber) Hasle in the River Danube, near Budapest (1991, 92 - daily investigations).
In. J. P. Descy, C. S. Reynolds & Padisák 8eds) Phytoplankton in turbid environments: Rivers and shallow lakes. Kluwer Academic Publishers. Hydrobiologia. 289: 163-170.
1994.

The small, chain-forming centric diatom *Skeletonema potamos* (Weber) Hasle is one of the most important species in the phytoplankton of the River Danube at Hungary. In low water periods from May to October its abundance is high, contributing 10-20 % of the total biomass (its fresh weight is 3-6 mg l^{-1}). The main factors influencing the quantities of S. potamos populations are floods and temperature. Floods have a complex effect. Current velocity increase is not insignificant. Transparency influenced by the suspended matter content is important. In low water periods 70-90 % of the water column belong to the euphotic zone. For this reason, low water periods favour increases in the phytoplankton density. On the basis of this study, we conclude that *S. potamos* is a warm stenothermic species with high light demand. Changes in the length of the pervalvar axis, diameter, S/V ratio, cell number in chains are influenced by the temperature, duration of daylight and cell division rate.

K.K.T./B.Á.

481. Kiss, K. T. - Bereczky, M. Cs.

The study of the phytoplankton and the ciliate fauna of the Danube from Vilkovo to Vienna in March, 1988. (in German)
Ergebnisse der Donauexpedition 1988. Eigenverlag der IAD. Wien, 163-171.
1990.

Algological and protozoological samples were taken at 21 sites (including Gabcikovo, 1819 river km) from Vienna to Vilkovo (Danube Delta) between

5 and 16 March, 1988 during the Danube expedition of the International Association for Danube Research. 122 algal taxa were found. 4 *Cyanophyta*, 4 *Euglenophyta*, 11 *Chrysophyceae*, 47 *Bacillariophyceae* (15 *Centrales*, 33 *Pennales*) 1 *Dinophyceae*, 8 *Cryptophyceae* and 46 *Chlorophyceae* species.
The abundance of algae was analysed along the river. 112 *Ciliata* species were found in 19 plankton samples. Qualitative and quantitative data and species lists can be found in the article.

O.N.

482. Kiss, K. T. - Coste, M. - Le Cohu, R. - Nausch, M.

Cyclotella caspia (Bacillariophyceae) in some Rivers and Lakes in Europe (Morphological Observations).
Cryptogamie, Algologie, 9: 27-42.
1988.

Dunasziget in the Szigetköz region was used as one of the sampling sites to conduct this electronmicroscopic, morphological and taxonomic study.

O.N.

483. Kiss, K. T. - Genkal, S. I.

Winter blooms of centric diatoms in the River Danube and in its side arms near Budapest.
In: H. van Dam, (ed.): Twelfth International Diatom Symposium. Kluwer Academic Publishers. Hydrobiologia, 269-270: 317-325.
1993.

Samples were taken weekly or monthly in the side arm and the main arm at Göd and in the Soroksári arm at Dunaharaszti and Ráckeve between 1979 and 1991. The results of the November-March collections are evaluated. When the water level was low the biomass of the phytoplankton (in the main arm) could be considerable even as late as November and as early as February. If the current velocity was low the phytoplankton of the side arms could proliferate even under the ice and the water became polytrophic with a dominance of *Centrales* (*Bacillariophyceae*) and *Synura* (*Chrysophyceae*) species. The current velocity of the side arms and the reservoirs of the Gabcikovo Nagymaros River Barrage System were similar, which made the occurrence of similar problems probable in their reservoirs.

O.N./K.K.T.

484. Kiss, K. T. - Genkal, S. I.

Winter blooms of centric diatoms in the River Danube and in its side-arms near Budapest (Hungary)
Hydrobiologia 269/270: 317-325.
1993.

Although the phytoplankton in large eutrophic rivers is often abundant,

data on winter populations are scarce. Phytoplankton has been sampled since 1979 in the main arm of the River Danube at Göd (20 km north from Budapest), and also in two side-arms, upstream and downstream of Budapest. The analysis of the winter samples has shown high population densities of phytoplankton 'blooms' on several occasions. In general centric diatoms (20 taxa determined) were abundant and dominant during the blooms. The most abundant taxon in November was *Stephanodiscus hantzschii* f. *tenuis,* and in February *S. minutulus.* The most important factors in forming winter blooms of Centrales are rich nutrient supply, slow current speed and high transparency.

Massive phytoplankton blooms occurred several times between November and March in the small side-arm at Göd.

K.K.T./B.Á.

485. Kiss, K. T. - Le Cohu, R. - Coste, M. - Genkal, S. I. - Houk, V.

Actinocyclus normanii (Bacillariophyceae) in some rivers and lakes in Europe. Morphological examinations and quantitative relations.
In: Richard, M. (ed.): Ouvrage dédié a H. Germain. Koeltz. Koenigstein, 111-123.
1990.

Weekly samples were collected between Rajka and Baja from 1985 to 1989. *Actinocyclus normanii* was a dominant diatom species in the Danube in summer during that period.
The literature and the author's investigation indicated that this species proliferated if the water became eutrophic.

O.N./K.K.T.

486. Kiss, K. T. - Kristiansen, J.

Silica-scaled chrysophytes from some rivers and shallow lakes in Hungary.
In: J. P. Descy, C. S. Reynolds & J. Padisák (eds) Phytoplankton in turbid environments: Rivers and shallow lakes. Kluwer Academic Publishers.
Hydrobiologia. 289: 157-162.
1994.

Silica-scaled chrysophytes are a special group in the phytoplankton of rivers and shallow lakes. They are present the whole year at low density, but sometimes - mainly during autumn and spring - some species can become frequent and very dense, forming real water blooms.
Seven species of silica-scaled chrysophytes were recorded and identified by electron microscopy of phytoplankton samples from some rivers and shallow lakes in Hungary. *Synura echinulata* has not previously been recorded from Hungary.

Some of them, namely *Synura curtispina, S. petersenii, Mallomonas acaroides, M. tonsurata* were frequently found in the phytoplankton and formed blooms, like in the Göd side arm, the Soroksári Duna and the side arm system of Szigetköz section of River Danube.

K.K.T./B.Á.

487. Kiss, K. T. - Nausch, M.

Phytoplankton studies at selected sites on the Danube at Klosterneuburg and Göd. (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 379-383.
1987.

Samples were collected monthly at Klosterneuburg (1942 river km) and weekly at Göd (1669 river km) in 1985. At low water periods the maximum individual number of phytoplankton fluctuated between 10 and 25 million l^{-1} at Klosterneuburg, 40-60 million l^{-1} at Göd. *Centrales* (*Bacillariophyceae*) species had approximately a 90 % dominance in spring, and 65-75 % dominance in summer. The relative abundance of *Chlorococcales* (*Chlorophyta*) species was between 20-30 % in summer. The individual number of algae and consequently trophity increased 2-3 times from Vienna to Budapest.

O.N./K.K.T.

488. Kiss, K. T. - Nausch, M.

Comparative investigations of planktonic diatoms of a section of the Danube near Vienna and Budapest.
In: Round, F.: Proceedings 9th Internat. Diatom. Symp., Bristol, 115-122.
1988.

Samples were taken monthly at Klosterneuburg (1942 river km) and weekly at Göd (1669 river km) from April to November in 1985. Electronmicroscopic studies completed the taxonomic analysis of the *Centrales* order (*Bacillariophyceae*). The species composition was basically the same at the two sites but several *Centrales* species were more abundant at Göd. The individual number of algae increased 2-3 times from Vienna to Budapest.

O.N./K.K.T.

489. Kiss, K. T. - Schmidt, A. - Bartalis, E.

Phytoplankton studies in the Hungarian section of the Danube in 1987. (in German)
29. Arbeitstagung der IAD. Kiew. Wissenschaftliche Kurzref., 76-80.
1991.

Phytoplankton samples were taken at seven sites between Rajka and Budapest. The relationship between the chlorophyll a concentration and the water discharge was analysed the seasonal average and maximum algal individual numbers is presented together with the fluctuation of the

chlorophyll-a concentration at Rajka, Göd, Baja in 1983 and 1986-87. The stretches were trophically characterised: the mesotrophic water at Rajka became eutrophic along the Göd-Baja section.

O.N.

490. Kozma, E.

Data on the quality of the groundwater along the Hungarian Upper Danube. Danub. Hung. XXII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 6: 119-127.
1963.

A detailed analysis of the groundwater near the Danube in the Szigetköz region was carried out between 1 and 18 October, 1961. The investigation was made at Medve and Nagybajcs at several sites at different distances from the main arm. pH, alkalinity, hardness, Ca^{2+}, Mg^{2+}, Cl^{-}, HCO_3^{-} and oxygen concentration values are presented in tables.

O.N.

491. Kozma, E.

Some data on the water chemistry of the Moson Reach. Danub. Hung. LI. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 12: 65-76.
1970.

Samples were taken along the Moson Reach at Mosonmagyaróvár upstream to the mouth of the Lajta and south to the town, at Magyarkimle, Lickópuszta and Zsejke ten times from 20 June 1962 to 23 June 1964.
Water chemical tables made include 18 parameters: pH, alkalinity, carbonate and non-carbonate hardness, total, Ca, Mg hardness, HCO_3, Ca^{2+}, Mg^{2+}, Na^{+}, SO_4^{2-}, NH_4^{+}, NO_2^{-}, NO_3^{-}, SiO_2 concentrations and the $KMnO_4$ consumption.
Background data for all parameters was collected on the main arm of the Danube at the bridge of Medve on the Lajta at each sampling time.

O.N.

492. Kozma, E.

The relationship between the chemistry of the interstitial water and the characteristics of the sediment along the Hungarian Section of the Danube. Danub. Hung. LIX. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 13: 53-67.
1971.

The chemical composition of the interstitial water along the Hungarian Danube section was investigated at Mosonmagyaróvár and Magyarkimle in the Szigetköz region and at Alsógöd from October 1962 to August 1963 and May 1963 to April 1964.
Besides a description of the sediment 13 parameters were analysed in making the comparison of the Danube and the adjacent groundwater, the

sites and the sampling times (pH, alkalinity, total hardness, Ca^{2+}, Mg^{2+}, Cl^-, SO_4^{2-}, NH_4^+, NO_2^-, NO_3^-, SiO_2 concentrations, $KMnO_4$ consumption, oxygen saturation).

O.N.

493. László, F. - Varga, P.

The water quality of the Danube between Bratislava and Nagymaros. (in German)
28. Arbeitstagung der IAD. Varna. Wissenschaftliche Kurzref., 11-14.
1990.

61 parameters were investigated fortnightly in 15 transects between April 1989 and April 1990 to give a comprehensive description of the water chemistry of the Danube along the Bratislava Nagymaros section. The data of 28 components at Komárom (oxygen budget parameters, dissolved organic carbon and total salt concentration, plant nutrient forms, the concentrations of organic and inorganic micropollutants, saprobity index, chlorophyll-a concentration, the abundance of the phytoplankton, bacteriological and radiological data) are also presented in table form.

G.P.

494. Mészáros, F. (ed.)

The zoological survey of the Szigetköz region of the Danube. (in Hungarian)
In: A magyar-csehszlovák közös Duna-szakasz és a kapcsolódó térségek fejlesztésével, rehabilitációjával összefüggő kutatási program - I. ütem. Hungarian Academy of Sciences - Hungarian Natural History Museum. Zoological Section. Manuscript. Budapest, 1-4.
1992.

A short summary of the 1992 results is presented on the animal groups surveyed (*Mollusca, Crustacea, Odonata, Heteroptera, Coleoptera, Trichoptera, Lepidoptera, Pisces, Amphibia, Aves, Mammalia).*

O.N./B.Á.

495. Mészáros, F. (ed.)

The botanical and zoological survey of the planned Fertő-Hanság-Szigetköz National Park and recommendation for its zonation. I. Szigetköz. (in Hungarian)
Hungarian Natural History Museum. Zoological Section. - Ministry for the Environment, Nature Conservation Agency. - Directorate of Lake Fertő National Park. Manuscript. Budapest, 1-325.
1992.

The species list and distribution of animals in the Szigetköz is presented. Areas worth protecting are indicated with the description of their botanical and zoological value.

The system used by the IUCN in designating the levels of use in conservation areas is also included.

O.N./B.

496. Mészáros, F. (ed.)

The zoological survey of the Szigetköz region of the Danube (Summarizing report for 1991-92). (in Hungarian)
Hungarian Natural History Museum. Zoological Section. - Hungarian Academy of Sciences (Ad Hoc Committee). Manuscript. Budapest, 1-81.
1993.

The report summarises the research of the Zoology Section of the Hungarian Natural History Museum. Results are given according to animal groups. The zoological value of the Szigetköz is also introduced and a brief prediction is made on the effect of the C variant on the wildlife.

O.N./B.

497. Molnár, M.

The microbiological study of the Moson Reach. Danub. Hung. XL. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 9-10:309-322.
1968.

Samples were collected for microbiological studies at six sites along the Moson Reach between Mosonmagyaróvár and Győr, from the Lajta and the Danube at the bridge of Medve in 1962-64. The parameters investigated from the 116 water samples included the coliform and the total bacterium number and the qualitative analysis of enterobacteriophages.

O.N.

498. Naidenov, W. - Schewzova, L. W.

The distribution of the metazooplankton in the Danube (20-1928 river km) in March, 1988. (in German)
Ergebnisse der Internationalen Donauexpedition 1988. Vienna, 181-190.
1990.

The qualitative and quantitative survey of *Rotatoria*, *Cladocera* and *Copepoda* species was carried out by an international expedition in March 1988. Samples were taken at 19 transects from 20 to 1928 river km among others at Visegrád, Gabcikovo and Bratislava.
The presence of 59 *Rotatoria*, 13 *Cladocera* and 9 *Copepoda* species was detected. 12-30 species occurred in one transect. The most species rich area was at Gabcikovo. The predominant species were the following: *Brachionus calyciflorus*, *B. urceolaris*, *Keratella cochlearis*, *Kellikottia longispina, Bosmina longirostris, Eudiaptomus gracilis, Polyartha dolichopters.* The presence of several species was restricted to certain sections i.e. *Cyclops vicinus* and *C. strenuus* only occurred in the middle,

Rhinoglena frontalis in the lower section.
The individual number of *Copepoda* was between 36.1-66.5 %, their biomass was between 47.2-79.1 % of the total. With *Rotatoria* these percentages were 30-74.8 % and 17.7-50 % respectively. The individual number and amount of *Cladocera* was small primarily because of the cold water temperature. The total individual number of the zooplankton varied between 1020 and 5950 in a cubic meter, the biomass was between 4.3 and 46.9 mg m^3. The saprobiological study indicated β-mesosaprobic conditions along the whole section.

G.P.

499. Nausch, M. - Kiss, K. T.

Quantitative phytoplankton studies on the Danube at Klosterneuburg, upstream Vienna, Austria and at Göd, Hungary. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 232-236.
1985.

Samples were taken at twenty points of a Klosterneuburg transect (1942 river km) on 4 April 1984 and in the main current of the Danube at Göd (1669 river km) on 11 April 1984. The species composition of *Centrales* (*Bacillariophyceae*) was basically the same at the two sampling sites.

O.N./K.K.T.

500. Nesemann, H.

Zoogeography and composition of leech fauna of Danubian lowland rivers in the Kisalföld compared with some molluscs (Hirudinea, Gastropoda).
Miscnea zool. Hung., 6: 35-51.
1991.

This paper is based on collectings between 1987 and 1991. Twenty four leech species were found in the Danube and six smaller rivers. The greatest number of species, 22 was recorded in the Danube. Several species were found in the Szigetköz.

F.L.

501. Nesemann, H.

Species composition and zoogeography of the invertebrate fauna at the lower reaches of the Lajta River.
Miscel. Zool. Hung. Budapest, 7:15-38.
1992.

The author investigated the species composition and the distribution of the invertebrate fauna along the lower section of the Lajta. The species composition resembled those of the Danube and several small streams in the Little Hungarian Plain. Longitudinal zonation was found. The species composition indicated an upper Pleistocene origin.

The following groups were studied: *Porifera*, *Bryozoa*, *Hirudinea*, *Bivalvia*, *Gastropoda*, *Crustacea*.

G.P.

502. Németh, J.

Daily phytoplankton studies in the Ásványráró side arm of the Danube in the summer of 1985. (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 164-169. (in German)
1987.

The structure of the phytoplankton was analysed at one sampling site in the
Ásványráró side arm system between 20 June and 10 September, 1985. The sampling frequency chosen gave the required amount of data to accurately predict the effect of flooding on the community. In the greatest linear fraction above the 3 μm length *Centrales* species dominated during the whole period. The flood beginning on 5 August decreased both the species number and their population density. After the flood both parameters increased and *Skeletonema subsalsum* (A. CLEVE) BETHGE became dominant. The smaller floods at the end of August mainly affected the individual number of *Centrales* diatoms. In the following low water periods the individual number of phytoplankton increased with practically the same dominance ratios.
An inverse relationship was found between the individual number of the phytoplankton and the water discharge. Besides seasonal changes the species composition and the individual number of the phytoplankton in the unpolluted side arm was determined by changes in hydrological conditions.

G.P.

503. Németh, J.

Qualitative analysis of the phytoplankton of different water bodies in the Szigetköz region. (in Hungarian)
Műhely. Geographycal Research Institute of the Hungarian Academy of Sciences . Budapest, 1-19.
1989.

The phytoplankton communities of the Danube, the side arm system in the Szigetköz and the Zátonyi Danube with no direct main arm connection were determined and classified after the qualitative analysis of samples from 15 sites collected between 1983 and 1988 using multivariant methods (cluster and correspondence analysis). The aim of the study was to describe the algal flora of the area and the elucidation of structural changes due to the lack of the direct water exchange with the Danube and the development of long term-lentic conditions. The study also includes the matrix on the distribution of the 275 taxa, on which the analyses were based.

G.P.

504. Németh, J.

Qualitative algological studies in the Szigetköz in 1983-1989. (in German)
28. Arbeitstagung der IAD. Varna Wissenschaftliche Kurzref., 27-30.
1990.

The algal flora of the Szigetköz was investigated at approximately a 100 sampling sites between 1982 and 1989. Correspondence analysis was used to compare 15 sampling sites representing the different water types in the area. As a result the following groups could be distinguished:
-- the main arm and the side arms in direct connection with it,
-- the Zátonyi Danube which had not been in direct connection with the main arm and became a standing water for decades,
-- the marshy, lower section of the Zátonyi Danube.

G.P.

505. Németh, J. - Gulyás, P.

In situ experiments of eutrophication in a side arm system of the Danube in the Szigetköz. (in German)
28. Arbeitstagung der IAD. Wissenschaftliche Kurzref., 31-34.
1990.

Short-term hydrological changes caused by the reduction in current velocity and the total loss of current were investigated in the open water and artificially isolated water columns (limnocorals) of the Ásványráró side arm system in September, 1988. At the beginning of the experiment water flowed in from the main arm providing an opportunity to follow the process of water from the Danube becoming standing water. The following parameters were recorded daily: light conditions, water temperature, suspended matter content, pH, conductivity, the concentration of inorganic nitrogen and phosphorus molecules, COD, chlorophyll-a concentration, the individual number, biomass and the species composition of phyto- and zooplankton. Reduction in current velocity causes a decrease in the suspended matter content causing greater transparency and an increasingly deep photic layer, the region where there is enough light for photosynthesis. The reproduction of planktonic algae accelerates, the individual number and the chlorophyll a content increases.
The increase in the individual number of the phytoplankton, the food source for the filter-feeding zooplankton and the decreasing current velocity, a more favourable abiotic condition resulted in the increase of the individual number and biomass of the zooplankton. The slowing down of the Danube led to eutrophication, a predictable detrimental ecological change caused by the planned barrage.

G.P.

506. Németh, J.

New experimental studies on the eutrophication processes of the side arm systems in the Szigetköz region of the Danube.
30. Arbeitstagung der IAD, Zuoz - Switzerland 1994, Wiss, Kurzref. 123-

127.
1994.

The effects of hydrological conditions and environmental factors (eg. irradiation, plant nutrients) on the water quality of the Danube and its side arms with special emphasis on the eutrophication processes were studied in the Szigetköz Landscape Protection Area (Hungary) during the autumn of 1988, 1991 and 1992 in enclosure experiments.
Multivariate analysis of 15 physical, chemical and biological variables has been used to study the temporal variations of the ecological status.
The alterations of the hydrobiological status were basically determined by hydrological conditions. The isolation of the water bodies led to a high degree of eutrophication in the Danube-water independently from the nutrient load.

N.J./B.Á.

507. Németh, J. - Skobrák, F.

Comparative hydrobiological studies in the main and the side arm of the Danube at Ásványráró in 1984. II. Phytoplankton and chlorophyll-a content. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 237-241.
1985.

The species composition and the quantity of phytoplankton and the chlorophyll-a content of the Danube (1819-20 river km) and the Ásványráró side arm system along that section was investigated at nine sites twice in 1974 (5-6 September, 23-24 October). Two conclusions were made:
-- The individual number and the biomass of the phytoplankton were several times greater in wide, transparent sections of the Ásványráró side arm section than those in the main arm at the same time. Consequently the trophity of the Danube water increased because of reservoirs even if there was no extra nutrient input.
-- The chlorophyll-a content and the phytoplankton biomass gradually increased almost parallel to one another from the downstream mouth of the Ásványráró side arm system connected to the main arm and to the wide, highly transparent section.
The sampling sites were grouped with cluster analysis according to the structure of their phytoplankton.

G.P.

508. Nosek, J. N. - Bereczky, M. Cs.

Structure investigation of ciliate - plankton community in the main and in a side arm of the river Danube by correlation - and path analysis. (in German)
Arch. f. Protistenkunde, 124: 173-192.
1981.

The effect of some physical and chemical factors on the structure of the planktonic *Ciliata* communities in the main arm and the side arm of the

Danube at 1669 river km was investigated using multivariant statistical methods. In spite of its lotic nature the main arm was more stable in its physical and chemical parameters. There was no important difference between the two arms in terms of the species number, diversity and uniformity but the total number of individuals and the species composition differed significantly. Diversity changes were mainly caused by changes in the species number but this effect decreased with more unstable environmental conditions. The effect of the environmental parameters on the total number of individuals was considerably greater in the less stable side arm than in the main arm.

O.N./N.J.

509. Nosek, J. N. - Bereczky, M. Cs.

Structural investigations of periphytic protozoan communities in three layers of the Danube River. II. The course of colonization.
Workshop on Periphyton. Vaxjö. Sweden. Abstracts, 13.
1982.

Protozoan colonization was investigated at different depths of the Danube using artificial substrates. 122 *Protozoa* species were found, none of them were restricted to only one water layer. In the first eight days of the experiment bacterium- and microalgae feeders dominated. On the 16th day predaceous and omnivorous species were also recorded. The periphyton was at the highest stage of development between the 8th and the 16th day, after that period both the number of species and individuals decreased. The rate of colonization was much faster near the bottom and in the middle layer than at the surface. The subsurface water layer proved to be a less favourable environment for periphytic protozoans.

O.N./N.J.

510. Nosek, J. N. - Bereczky, M. Cs.

Structural investigations of periphytic protozoan communities in three layers of the Danube River. II. The course of colonization.
In: Wetzel, R. G.: Periphyton of Freshwater Ecosystems. Developments in Hydrobiology, 17. Dr. W. Junk. The Hague, 55-58.
1983.

Protozoan colonization was investigated in different depths of the Danube using artificial substrates. 122 *Protozoa* species were found, none of them were restricted to only one water layer. In the first eight days of the experiment bacterium- and microalgae feeders dominated. On the 16. day predaceous and omnivorous species were also recorded. The periphyton was the most developed between the 8. and the 16. day, after that period both the species and the individual number decreased. The speed of the colonization was much faster near the bottom and in the middle layer than at the surface. The subsurface water layer proved to be a less favourable environment for periphytic protozoans.

O.N./N.J.

511. Nosek, J. N. - Bereczky, M. Cs.

A study of ecological similarity of species using multivariate analysis.
Proc. of the 15th Intern. Biometric Conf. Budapest. Abstracts, 190.
1990.

The effect of abiotic environmental factors on the population size of 30 dominant *Ciliata* species was studied for four years. Samples were taken every week. They were described using cluster and principle component analysis. Two main groups could be distinguished. One preferred "cleaner water" (oligo-, oligo-β-, β-mesosaprob indicator species). The dissolved oxygen content was in positive, the ammonium concentration and the chemical oxygen demand were in negative correlation with the population size of these species. The other group contained α-mesosaprob and polisaprob indicator species preferring "polluted waters". The total salt content was in a positive, the dissolved oxygen content in a negative correlation with the abundance of these species. The cluster analysis revealed that the changes of the pH and the ammonium concentration, the water temperature and the chemical oxygen demand combined together in pairs had a similar effect on the species. The effect of oxygen was different to that of the previously mentioned pairs. The principal component analysis identified three environmental parameter groups. One group was dependent upon the organic matter production (ammonium concentration, pH, chemical oxygen demand) the other upon seasonality (water temperature, psychrophyl bacterium number) and the third upon the water level fluctuation (water discharge, total salt content).
Species preferring "polluted waters" were more euryok than the member of the other group.

O.N./N.J.

512. Nosek, J. N. - Bereczky, M. Cs. - Oertel, N.

The stratification of planktonic Protozoa communities in the Danube. (in German)
23. Arbeitstagung der IAD. Wien. Wissenschaftliche Kurzref., 116-119.
1982.

The structure of the planktonic Ciliata community and several physical-chemical parameters were studied at different depth (subsurface, middle and bottom layer) and at different water levels in the Danube at Göd (1669 river km). Data was processed by multivariant analysis of variance. There were significant differences ($p<5$ %) between the temperature, pH, conductivity, dissolved oxygen concentration and redox potential of the subsurface and the bottom layer. No such differences were found between ($p<5$ %) the *Ciliata* communities of the subsurface and the bottom layer. All three parameters were higher near the river bed. Water level fluctuation determines stratification, a constant level of water discharge aids its development.

O.N./N.J.

513. Nosek, J. - Oertel, N.

Periphyton investigations.
UNDP/WHO "Hungary 3101" Project. Budapest-Göd, 97-117.
1975.

The mapping of the littoral and periphytic macrofauna from Rajka to Budapest along the Danube was carried out in 1975 under the auspices of the UNDP/WHO Project. Qualitative and quantitative samples were collected from stones and floating pontoons (artificial substrate). Animals were determined to species or genus level. This data and the qualitative results enabled the authors to zoologically distinguish the Rajka-Medve-Gönyű and the Gönyű-Szob-Budapest section and also the right and the left banks.

O.N.

514. Nosek, J. N. - Oertel, N.

The zoological investigation of the periphyton of the Danube between Rajka and Budapest. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 22-23:187-204.
1981.

Qualitative and quantitative periphyton sample series were collected from the Danube at Rajka (1848,4 river km), Medve (1806,4 river km), Gönyű (1771,3 river km), Szob (1707 river km), Nagymaros-Visegrád (1694,5 river km) and Budapest-Újpest (1658 river km) in each season in 1975-76.
The occurrence of macroinvertebrates (*Hydridae, Nematoidea, Oligochaeta, Hirudinoidea, Gastropoda, Lamellibranchiata, Bryozoa, Cladocera, Ostracoda, Copepoda, Isopoda, Amphipoda, Ephemeroptera, Coleoptera, Trichoptera, Diptera, Chironomidae* larvae) was given in table form.
The effect of hydrological conditions, hydrologically different sections, natural and artificial substrates (stones, pontoons) on the species and their population density in the communities is discussed.

O.N.

515. Nosek, J. N. - Oertel, N.

A comparison of the periphytic communities in two sections of the Danube River.
Workshop on Periphyton. Waxjö. Sweden. Abstracts, 13.
1982.

The periphytic macrofauna was investigated for two years in the main arm of the Danube between Rajka (1848 river km) and Újpest, Budapest (1658 river km). Samples were taken every month. The periphyton mainly consisted of *Cladophora glomerata* at most sampling sites. The number of periphytic macrofauna taxa increased from March to the end of May, beginning of June, when it stabilised with moderate fluctuations till October, when it began to decrease. Two peaks in the number of individuals were detected, the biggest in April-May and a smaller one in

October-November. The decrease at the beginning of the summer was caused by the emergence of hemihydrobiont species. The species and individual number of the periphytic macrofauna was in positive correlation with the reduction in the current velocity.
The relative abundance of the dominant species and the species composition were similar along the investigated section. Differences between the different stretches was caused only by the occurrence of rare species present in low individual numbers. A considerable number of benthic species were found. The great number of planktonic *Cladocera* and *Copepoda* individuals with egg sacks indicated the importance of the *Cladophora* periphyton in the population dynamics of those crustacean groups.

O.N./N.J.

516. Nosek, J. N. - Oertel, N..

A comparison of the periphytic communities in two sections of the Danube River.
In: Wetzel, R. G. (ed.): Periphyton of Freshwater Ecosystems. Developments in Hydrobiology 17. Dr. W. Junk. The Hague, 17-22.
1983.

Periphytic macrofauna communities of floating harbour pontoons along the Rajka-Budapest Danube section were compared. The periphyton mostly consisted of *Cladophora*.
Differences between the right and the left banks, stretches with different characteristics and the opposite sides of the pontoons (towards the bank and the middle of the river respectively) could be identified with dominant and concomitant species of the community (*Chironomidae*, *Oligochaeta*, *Nematoidea*, *Diptera*, other groups).

O.N.

517. Oertel, N.

Results of the surveillance of the upper, middle and lower layer of the Danube. II. The in situ investigation of some water chemical parameters on the Danube. (in Hungarian)
XXII. Hidrobiológus Napok. Tihany. Abstracts. 19.
1980.

The stratification in the main arm of the Danube has been identified by measuring physico-chemical parameters with a Model 6-D in-situ Water Quality Analyser (Surveyor) every alternate day since 1979. It basically depended on the water discharge and could best be detected by measuring first of all biologically important factors i.e. temperature, dissolved oxygen content, pH, redox potential. The stratification becomes obvious and stable during the low water period in autumn.

O.N.

518. Oertel, N.

The main arm-side arm connection on the Danube at Göd on the basis of some water chemical parameters. (in Hungarian)
Hidrol. Közl., 62: 469-474.
1982.

Physical and chemical parameters of the main arm and the side arm and their temporal stratification was compared at typical water levels (623, 376 and 260 cm) during continuous in-situ monitoring. When the water level was higher than the mean water level, which is the characteristic height of the top of transverse dikes along the Hungarian Middle Danube, the water flowing over them terminated the developed stratification. In low water periods side arms had connections with the main arm only through the sediment. Lentic conditions and biological process-related vertical stratification developed in those periods.

O.N.

519. Oertel, N.

The fate of dissolved and particulate forms of iron in the Danube. (in German)
24. Arbeitstagung der IAD. Szentendre. Wissenschaftliche Kurzref., 1: 25-28.
1984.

The distribution of iron in different phases is discussed in the article. Samples were taken weekly in 1980-83 at Göd (1669 river km). The connection between different phases (total and dissolved iron content, particulate and total iron content), regression equations and the trends of the annual changes are also presented. A hyperbolic curve describes the relationship of the particulate iron content and the suspended matter content in the period of study, which was used to write a predictive mathematical equation.

O.N.

520. Oertel, N.

Heavy metals in the water and suspended matter of the Danube at Göd (1669 river km) in 1981-83. (in Hungarian)
XXVII. Hidrobiológus Napok. Budapest. Abstracts. (ISSN 0236-5804), 21-23.
1985.

The background concentration of Ag, Cd, Cu, Fe, Hg, Pb and Zn and the amount of pollutants could be estimated for the given Danube section (Göd, 1669 river km) by the evaluation of the pollution load and water discharge.

O.N.

521. Oertel, N.

Stratification investigations on the Danube using physical-chemical parameters. (in Hungarian)
XXVII. Hidrobiológus Napok. Budapest. Abstracts (ISSN 0236-5804), 24-25.
1985.

Physical and chemical parameters were measured in three depths in the main arm of the Danube upstream of Budapest (Göd, 1669 river km) with a Model 6-D in-situ Water Quality Analyser (Surveyor) every alternate day between 1979 and 1984. Stratification, which depends first of all on the water level and is in a close correlation with the biological activity of i.e. the zooplankton investigated in different depths, was the most developed in the temperature, dissolved oxygen concentration, pH and redox potential. Stratification existed for months or weeks in low water periods during the six year period of the study. In 67 % of the cases the surface and the middle part made up a thicker upper layer above a thinner lower layer.

O.N.

522. Oertel, N.

Physico-chemical stratification in the Danube. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenchaftliche Kurzref., 49-52.
1985.

The existence of stratification in the main arm of the Danube upstream of Budapest was proved using physical and chemical parameters measured on every alternate day between 1980 and 1984 by a "Model 6-D in-situ Water Quality Analyser (Surveyor)". The parameters which proved to be the most useful in discerning stratification were important for biological activity i.e. temperature, dissolved oxygen concentration, pH, redox potential. Stratification became obvious and long-lasting during autumn low water periods. The presence of the phenomenon in five consecutive years with different stream-flow regime proved that this was a regular process.

O.N.

523. Oertel, N.

The heavy metal content of the Danube at Göd (1669 river km) in 1981-83. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenchaftliche Kurzref., 130-134.
1985.

The heavy metal concentration (Ag, Cd, Cu, Fe, Hg, Pb, Zn) in the Danube at Göd was measured weekly by using atomic absorption spectrophotometry. The data from 1981, 1982 and 1983 was analysed (annual average, standard deviation, analysis of variance) and compared with surface and drinking water standards. On the basis of correlations between the water discharge and the pollution load the article describes a

method to distinguish background (Fe, sometimes Pb) concentration and pollution (Ag, Hg, Zn).

O.N.

524. Oertel, N.

The heavy metal content of the water, suspended matter and periphyton in the Danube at 1669 river km. (in German)
26. Arbeitstagung der IAD. Passau. Wissenschaftliche Kurzref., 50-55.
1987.

Both the dissolved and particulate heavy metal concentration in the Danube at Göd (1669 river km) was compared to the heavy metal concentration in periphytic *Cladophora glomerata* that developed on artificial floating substrate. This was the first time that such a comparison had been made at this river section.
Data on the heavy metal concentration of the water and the suspended matter represents the background concentrations of metals upstream of Budapest in the first half of the 1980s. They were also used in the evaluation of the field experiments on bioaccumulation.

O.N.

525. Oertel, N.

Heavy metal accumulation of the periphyton in the Danube. (in Hungarian)
XXIX. Hidrobiológus Napok. Tihany. Abstracts. 35-36.
1987.

Cladophora glomerata grown on artificial floating substrates were used to study the heavy metal accumulation in the Danube. Samples were taken for 23-25 weeks in the vegetation period. The development of this dominant periphytic algae and its dependence on environmental factors were elucidated.
The different relative concentration of Ag, Cd, Cu, Fe, Hg, Pb, Zn in the water and the algae indicated active bioaccumulation.

O.N.

526. Oertel, N.

Heavy metal content and accumulation in the Danube. (in Hungarian)
In: Környezeti hatások hidrobiológiai vizsgálata áramló vizekben. G-10-070/87 study, 1-27.
1990.

The study describes in detail the heavy metal concentration of the dissolved and particulate phases of the Danube upstream of Budapest from 1981 to 1989. It also contains data on living organisms (periphytic green algae and periphytic macrofauna).
By the mid 1980s there had been a general improvement at Göd (1669 river km) but the emission of several toxic metals (Cd, Cu, Hg, Pb, Zn) increased again at the end of the decade. Both average and maximum

values were higher than they were previously. A new, water discharge dependent evaluation of the data was introduced to enable the recognition of the actual tendencies as the actual water management practise was not adequate to fulfil this role.

O.N.

527. Oertel, N.

Heavy metals in the River Danube: Water, suspended matter, periphyton.
Verh. Internat. Verein. Limnol., 24: 1961-1964.
1991.

The dissolved and particulate heavy metal concentration of the water and the heavy metal accumulation of the periphyton at Göd (1669 river km) from 1981 to 1988 are summarized. Weekly or monthly data is included on Ag, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Pb Zn (microelements) and Ca, K, Mg, Na (macroelements).
After hydrological relationships had been elucidated between the water discharge and the suspended matter content for the Danube upstream of Budapest and evaluations had been made according to water discharge ranges the trends of this Danube section in the 1980s were readily established.
The comparison of the heavy metal accumulation of the periphyton and the suspended matter content helps scientists working on practical problems to chose the best analytical method for determining pollution levels.

O.N.

528. Oertel, N.

Heavy-metal Accumulation in Cladophora glomerata (L.) Kütz in the River Danube.
AMBIO, 20: 264-268.
1991. 1991.

The mapping of the heavy metal concentrations of the Danube upstream of Budapest was made using the predominant littoral green algae, *Cladophora glomerata*. The development and implementation of a new artificial floating substrate suitable for active biomonitoring is discussed in detail.
The dependence of the heavy metal concentrations on internal or environmental parameters (the heavy metal concentration of the water, physical and chemical characteristics) is also discussed. The typical Ag, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Zn (microelements) and Ca, K, Mg, Na (macroelements) concentrations and concentration factors of *Cladophora glomerata* along the investigated stretch is given in a table. The biomonitor organism indicates pollution when higher values are measured.

O.N.

529. Oertel, N.

The heavy metal content of the water, suspended matter and periphytic organisms of the river Danube. (in Hungarian)
PhD thesis. Hungarian Danube Research Station of the Institute of Ecology and Botany of the Hungarian Academy of Sciences. Göd. 1-148. Library of the Hungarian Academy of Sciences.
1991.

The PhD thesis provides an overview on the heavy metal concentration of the Danube upstream of Budapest (9 year data series) and several side arms in the Szigetköz region in the 1980s. The data base containing approximately 25,000 data items is the basis of a chemical and biological monitoring system to be set up in the near future to aid international water quality monitoring of the Danube.
Important theoretical and methodological approaches can be found in the work on the opportunities for utilising the heavy metal concentration of suspended matter to recognize long term changes, the introduction of the actual background to distinguish background values and anthropogenic pollution, describing the river stretch by dividing the pollution load according to its origin into "outer" and "inner" parts, and the implementation of passive and active biomonitoring to detect heavy metal pollution.
Besides all these basic research questions several examples are also included on the relationship of river and drainage basin and the probable problems caused by reservoirs.

O.N.

530. Oertel, N.

The applicability of Cladophora glomerata (L.) Kütz in active bio-monitoring technique to monitor heavy metals in the River Danube.
The Science of the Total Environment, (in press).
1994.

The green algae, *Cladophora glomerata* was used in an active biomonitoring experiment to establish the heavy metal concentration in the Danube upstream of Budapest. Necessary preliminary investigations had been made to determine the key factors affecting the heavy metal concentration in the algae. Developmental stage, spatial vertical distribution, the heavy metal concentration, pH and redox potential of the water turned out to be the most important internal and external characteristics. Their effect must be taken into consideration when the given stretch is monitored by the test organism.

O.N.

531. Oertel, N.

Trend analysis of heavy metal concentration of the suspended matter in the River Danube.
Water Science and Technology, (in press).
1994.

The study discusses changes in the heavy metal fraction found in the suspended matter of the Danube at Göd (1669 river km) in the 1980s. From the weekly samples the increase of Ag, Cd, Cu, Pb and Zn concentration in the second half of the 1980s could be recognized by evaluating the data according to water discharge ranges. It indicated a greater emission of these metals. The data also provides an opportunity for comparisons to be made with other large rivers and the heavy metal concentration of the sediment in the given stretch. The latter proved that the heavy metal concentration of this section could better be described with the investigation of the homogenous suspended matter than that of the heterogeneous bed load characteristic of the middle section of a river.

O.N.

532. Oertel, N. - Bothár, A. - Bereczky, M. - Kiss, K. T.

Results of plankton studies on the Danube. (in Russian)
In: Otcsot o rabote delegicii szpecialisztov VNR po otboru pervicsnoj o okoncsatyelnoj obrabotke prob v ekszpedicii zaintereszovannih sztrancslenov SZEV po izucsenyiju radioaktivnosztyi reki Dunaj. Vengrija, 10.07.1979. Goda, c. 46-52.
1979.

Phyto- and zooplankton samples were collected from 16 sites of the Danube from its delta up to Bratislava (approximately 1800 km) during an expedition organized by the Council for Mutual Economical Assistance and the International Atomic Energy Agency in 1978. The main aim was the investigation of the radionuclide pollution of the river but the qualitative and quantitative study of the plankton also provided representative results for late summer-early autumn (August-September). The determination of algae, protozoans and planktonic crustaceans was carried out by the Hungarian Danube Research Station.

O.N.

533. Oertel, N. - Nosek, J.

Periphyton studies.
UNDP/WHO "Hungary 3101" Project. Budapest-Göd, 69-92.
1976.

The mapping of littoral and periphytic macrofauna along the Rajka-Budapest section of the Danube was carried out under the auspices of the UNDP/WHO Project in 1975-76. Qualitative and quantitative sampling was carried out from stones and artificial substrates (floating harbour pontoons). Animals were identified to species or genus level. This data together with the quantitative result helped to establish the zoological differences between the Rajka-Medve-Gönyű and the Gönyű-Szob-Budapest sections and the right and the left banks.

O.N.

534. Papp. B. - Rajczy, M.

The investigation of mosses as bioindicators in the Szigetköz region and along the Hungarian Upper Danube. (in Hungarian)
The Botanical Department of the Hungarian Biological Society. Lecture.
1992.

The results of research on mosses along the main arm and in several large side arm systems had already provided valuable results. The area has a rich moss flora with several rare species. One species is also listed in the Red Data Book (*Lunularia cruciata*) as threatened with extinction as its natural distribution is limited to the Szigetköz. 53 % of the species were characteristic of and limited to the temperate zone, 19 % were boreal-subboreal, 15 % subatlantic and 13 % submediterranean. Floristically the most valuable, most diverse sites (20-26 species) were those arms where willows and alders were present along the banks.
The shore of clear cut islands had no shade, which changed the microclimate. Rare vulnerable species disappeared from those areas. The cutting of willows along the bank hastened their disappearance.
A research project had also been launched to investigate the possibility of using species composition and individual number of aquatic and littoral mosses in the saprobiological description of different water bodies.

G.P.

535. Páter, J. - Molnár, M.

Microbiological investigation of the Danube in Hungary in 1958-59. Danub. Hung. XVI. (in German)
Arch. Hydrobiol. Suppl. Donauforschung, 27: 85-90.
1962.

The microbiological status of the Danube was studied from 1958 to 1959. Coli-forms, enteral bacteriophages and anaerobic viruses were collected. The evaluation mainly focused on the Szob-Nagymaros-Vác-Sződ-Alsógöd-Budapest section. Enteral bacteriophages proved to be excellent indicators of the proximity villages, towns and cities.

O.N.

536. Pintér, I.

The molluscs of Győr-Sopron county. The summary of previous studies till 1979. (in German)
Soosiana, 7: 35-44.
1980.

The author summarizes the distribution of *Mollusca* species in Győr-Sopron country using a UTM 10x10 km grid. Individual numbers are given in brackets. From the Szigetköz region the most extensive collections were taken at Győr, Győrzámoly, Dunasziget and Ásványráró.

G.P.

537. Ponyi, E.

Data on the planktonic Crustacea of the Hungarian Danube section. Danub. Hung. XIV. (in German)
Opusc. Zool. Budapest, 4: 127-132.
1962.

Detailed *Cladocera*, *Copepoda* and Isopoda species lists are given for the Esztergom-Mohács section. The samples were collected between 30.9. and 4.10.1958.

O.N.

538. Pujin, V.

The plankton of the Danube on the basis of the 1988 Danube expedition. (in German)
Ergebnisse der Internationalen Donauexpedition 1988. Vienna, 199-2018.
1990.

The composition *Rotatoria*, *Cladocera* and *Copepoda* plankton was investigated from 20 to 1928 river km along the Danube in March, 1988. In Hungary samples were collected at six sites. Altogether 66 species were found, 28 *Rotatoria*, 33 *Cladocera* and 5 *Copepoda*. 3 *Rotatoria* species, *Keratella cochlearis*, *Rotaria rotatoria* and *Synchaeta oblonga* were present in all the samples. The calculated similarity index was higher than 50 % in most cases. The highest values were found between Baja and Paks (82,8 %), the lowest along the lowest section at Nikopol (32,2 %). The Hungarian Upper Danube had the highest species richness. Stenotherm *Rotatoria* species were dominant in the communities.

G.P.

539. Puky, M.

The leech fauna of the Hungarian Danube section with special attention to the role of different habitats in the life cycle of the predominant species.
XXIV. Congr. of the Intern. Assoc. of Limnol. (SIL). Munich. Abstracts, 219.
1989.

The description of the leech fauna of the Hungarian section of the Danube included the Szigetköz region. Data were provided for the main arm, several side arms and oxbow lakes.

G.P.

540. Puky, M.

Changes in the Hirudinea fauna of the Szigetköz region between 1989 and 1993. (in German)
30. Arbeitstagung der IAD Zuoz - Switzerland.
Wissenschlafliche Kurzref., 79-82.
1994.
In 1993 there was an overall decrease in the number of *Hirudinea* species

in the Szigetköz region, which had been an extremely good habitat before. If the water level stabilizes this process could turn back in certain areas. *Erpobdella octoculata* remained the commonest species under the different circumstances. The *Hirudinea* fauna reacted fast to the change in the water supply, the loss of habitat diversity. There was a considerably smaller difference between the fauna of the different side arms in 1993. Specimens could first be collected from the once uniquely cold Forrásos arm and *Dina leneata* retreated from the side arms to the old river bed.

P.M./B.Á.

541. Puky, M.

Long-term changes in the distribution of leeches along the Danube in Hungary.
Verh. Internat. Verein. Limnol. 25: 1696-1696
1994.

The Hirudinea fauna of the Hungarian Danube section has been investigated. From a comparison with Soós's survey published in 1967 six new species' (*G. paludosa, G. verrucata, G. concolor, H. medicinalis, E. testacea, T. bykowskii)* presence were proved. *Trochaeta bykowskii* considerably enlarged its distribution area. The relative abundance of the species also changed though *E. octoculata, D. lineata* and *G. complanata* remained predominant. The colonization of newly excavated catch drains in the Szigetköz area turned out to be very slow in spite of the regular connection with the side arm system around them.

P.M./B.Á.

542. Rákóczi, L.

The water level fluctuation and the sediment transport of the Danube along the Rajka Gönyű section. (in Hungarian)
Hungarian Hydrological Society. Szigetközi Ankét. Győr, 1992. május 25-26., 33-52.
1992.

The results of regular sampling between Rajka and Gönyű revealed that the annual suspended matter load considerably decreased after 1965. Not only was the absolute quantity lower but the suspended matter concentration also decreased. As a results if years with similar water regime were compared there was less suspended matter after 1965. The fluctuation of the suspended matter concentration was similar at the Austrian Bad Deutch-Altenburg and at Rajka. The lowest values in three years were somewhat smaller than 1x10 t, mean values were around 3 x 10 t, the highest annual value was at 8 x 10 t at the Austrian station, 10 x10 t at Rajka. The disparity between the two highest values was quite remarkable. There is no explanation for this difference. Both sets of data were recorded in 1965 but there was no adequate information on the suspended matter load of the only large tributary between the two sites, the Morava.

O.N./G.P.

543. Ráth, B.

Macrophyton studies in the Váci Danube arm (1669-1690 river km) and its backwaters. Danub. Hung. CIV. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol. 22-23: 109-124.
1980-1981.

The author investigated the macrophyton colonization in the Danube Bend, one of the most popular holiday area in Hungary, in 1974-77. In the main arm *Potamogeton pectinatus* were present in large stands. In the backwaters *Myriophyllo-Potametum* was the most important community with *Ceratophylletum demersi* and *Trapetum natantis*. The water discharge fluctuation of the Danube was the most important environmental parameter affecting their development, vegetation period and the coverage of the macrophyton stands.

O.N./R.T.

544. Ráth, B.

The investigation of Potamogeton pectinatus stands in rivers. (in German)
23. Arbeitstagung der IAD. Vienna. Wissenschaftliche Kurzref., 99-103.
1982.

In Hungary the sago pondweed (*Potamogeton pectinatus*) had only occurred in standing waters. It has been present in the Danube since the 1970s due to man-made hydrological changes.
Spur dikes, longitudinal river walls were constructed leading to the slowing down of the current, sedimentation etc.
Nearly homogenous sago pondweed stands were found in 1974-75. *Butomus umbellatus f. submersus* was a characteristic concomitant species of those stands.

O.N./R.T.

545. Ráth, B.

The chemical composition of sago pondweed (Potamogeton pectinatus) in the Váci Danube arm. Danub. Hung. CIII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol. 24-26: 81-89.
1984-1985.

The study of the chemical composition of sago pondweed (*Potamogeton pectinatus*) was begun at four sites in the Váci Danube arm (Verőcemaros, Vác, Sződliget, Göd) in 1979-81. 13 elements were analysed from the plant. Considerable N (2.83 %) and P (0.37 %) values suggested a nutrient rich aquatic environment.

The concentrations of toxic microelements (Pb, Cu, Cd) in the plant tissue was relatively low.

O.N./R.T.

546. Ráth, B.

Macrophyton stands at Dunaremete (1826 river km) in the Szigetköz side arm system affected by the Gabcikovo-Nagymaros River Barrage System. (in German)
25. Arbeitstagung der IAD. Bratislava. Wissenschaftliche Kurzref., 254-257.
1985.

The macrophyton community of the Dunaremete side arm system (1826 river km) was investigated in 1984. The effect of water level fluctuations on the site is described in detail. A basic floristic map of the side arm is given together with the description of the dominant macrophyton stands. Phytomass and element (N, P) content, coverage and dry weights are also included.

O.N.

547. Ráth, B.

The macrophyton vegetation of a small branch-system of the Danube at Dunaremete (Szigetköz, River km 1826). Danub. Hung. CX.
Acta Bot. Hung. , 33: 187-197.
1987.

The macrophyton community of the Dunaremete side arm system (1826 river km) was monitored in July-August 1984 (4 times) and May-June, 1985 (4 times). *Nuphar lutea* and *Potemogeton* stands were dominant under the existing hydrological conditions. The vegetation was diverse because of the different stages of succession present. Phytomass and element content studies were also carried out, species lists are presented. There was a potential threat of eutrophication in the side arm.

O.N.

548. Ráth, B.

The investigation of Potamogeton pectinatus stands along the Danube upstream of Budapest occurring due to human impacts. (in Hungarian)
I. Hungarian Ecological Congress. Budapest. Abstracts, 159.
1988.

River regulation works in the 1970's created situations in which sedimentation could occur in the littoral zone of the Danube (i.e. around spur-dikes), which were suitable for colonization by macrophytes. The dominant species of these new communities, *Potamogeton pectinatus* was studied between Visegrád and Göd (1964-1670 river km). The productivity and the element accumulation (N,P) were analysed and compared with the water level fluctuations and the element content of the Danube.

O.N./R.T.

549. Ráth, B.

The ecological investigation of macrophytes from an oxbow lake along the Danube at Vác (1682 river km). Danub. Hung. CVI. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol. 27: (in press)
1990.

The development and the N and P accumulation in the different development stages of a *Myriophyllo-Potametum* community was studied in the oxbow lake at Buki Island, upstream Vác (1682 river km) for three years (1981-83). Besides climatic conditions the development of the community was mostly affected by the water level fluctuations of the Danube. The highest N and P values were found at the beginning of the vegetation period, when macrophytes grow intensively, the lowest at the end of the vegetation period, when the plants die.

O.N./R.T.

550. Ráth, B.

The investigation of aquatic plants in the Cikolaszigeti side arm system of the Szigetköz region (1835-1838 river km). (in Hungarian)
XXXIV. Hidrobiológus Napok. (The study of running waters.). Tihany, Abstract, 74.
1992.

Regular surveillance was carried out in the side arm system with the third largest bed area and the greatest number of arms, the Cikolaszigeti side arm system. Three water bodies were monitored (Forrásos arm, Disznós arm, Schiszler pond). Qualitative and quantitative data were collected and the coverage was estimated in different developmental stages and at different water levels.

O.N.

551. Ráth, B.

A new aquatic plant in Hungary: Elodea nuttalii (Planchon) St. John. (in Hungarian)
Bot. Közlem., 79: 35-40.
1992.

The study morphologically and taxonomically describes a macrophyton new for Hungary. It was found in the Forrásos arm of the Cikolaszigeti side arm system on 16th July, 1991. The water chemistry, macrophyton communities and algology of the side arm are also discussed based on sampling on 4th June, 16th July and 15th August, 1991.

O.N.

552. Ráth, B.

Botanical survey of aquatic macrophytes with Kohler method in the Hungarian Danube section at Vác (riv. km 1670-1697). (in German)

30. Arbeitstagung der IAD, Zuoz - Switzerland
Wissenschaftliche Kurzref., 1: 245-249.
1994.

The author introduced a new field method to describe macrophyton stands and the changes of the vegetation in rivers (Kohler 1978), which differs considerably from the earlier used Braun-Blanquet method. It uses species, not communities in its description, the abundance of the species is estimated along long, often several hundred meter stretches not on small quadrats etc. *Potamogeton pectinatus* turned out to be the most important species due to its average estimation value (K-I: 3.25) and it vas also the commonest species along the investigated Danube section occurring at 8 sites.

R.T./B.Á.

553. Ráth, B. - Oertel, N.

The heavy metal accumulation of Potamogeton pectinatus stands in the Danube upstream Budapest. (1670-1694 river km). (in German)
28. Arbeitstagung der IAD. Varna. Wissenschaftliche Kurzref., 35-38.
1990.

The heavy metal accumulation of *Potamogeton pectinatus* stands was investigated in 1983, 1985 and 1986. Eleven metals (Ag, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Zn) were monitored at four sampling sites (Göd, Sződliget, Vác, Verőcemaros). The concentration of most heavy metals in Potamogeton pectinatus increased during these three years especially those of the toxic elements (Ag, Cd, Hg, Pb). The highest concentration factors, that is the ratio of the heavy metal concentration in the organism and the waters, (10^5, 10^6) were found in the case of those elements which were present in the water only in small quantities (Ag, Cd, Co).

O.N./R.T.

554. Ráth, B. - Oertel, N.

Influence of water engineering of the structure and element-content dynamics of aquatic macrophyton vegetation in the Szigetköz side-arm system of the River Danube (Dunaremete, 1826 river km).
International Conference - Groundwater/Surface Water Ecotones. Lyon. Abstracts.
1993.

Changes in the species composition, coverage and heavy metal accumulation of the aquatic macrophyton community caused by construction works (dredging, crossdike construction etc.) in 1988 in connection with the Gabcikovo Nagymaros River Barrage System was investigated in the Dunaremete side arm system. Due to the lack of direct connection with the main arm the previously most widespread *Nuphar lutea* and *Nymphaea alba* stands shrank and several submerged species increeased their uptake of those metals which are usually bonded to

suspended matter in high proportions (Ag, Cd, Hg, Pb).

O.N./R.T.

555. Ráth, B. - Oertel, N.

The effect of water training on the heavy metal accumulation of aquatic plants in the Dunaremete side arm system (Szigetköz area, 1826 riv. km Hungary). (in German)
30. Arbeitstagung der IAD, Zuoz - Switzerland.
Wissenschaftliche Kurzref., 336-341.
1994.

The heavy metal accumulation (Ag, Cd, Co, Cr, Ni, Pb) of aquatic macrophytes, especially those of the submerged species *(Ceratophyllum demersum, Potamogeton perfoliatus)* increased from 1987 (control level) to 1988. A more increased accumulation was characteristic for metals that bound to a great extent to the suspended matter (Ag, Fe, Pb).
The authors suggest dredging during the construction of the first catch drain system changing the hydrochemical characteristis of the side arm system (increased amount of suspended matter and particulate heavy metal concentration) as the main cause of this phenomenon.

R.T./B.Á.

556. Richnovszky, A.

Data to the mollusc fauna of the flood area of the Danube. Danub. Hung. XLII. (in Hungarian)
Opusc. Zool. Budapest 7: 195-205.
1967.

The *Mollusca* fauna of the complete Hungarian Danube stretch and the floodplains along it is described in detail. Besides the systematical presentation, the habitats were also rouped ecologically. They were put into lotic, lentic, wet and dry categories. The detailed zoogeographical description of the species is also given.

O.N./G.P.

557. Richnovszky, A.

The ecological aspects of the mollusc fauna of the Hungarian Danube section. (in Hungarian)
Állattani Közlemények, 57: 125-130.
1970.

The different habitats along the Hungarian Danube section were classified according to ecological parameters. The species composition of the *Mollusca* fauna was mainly determined by the water level and the velocity of the current. The ecological requirements of the potamobiont species of the Danube, the necessary conditions for the colonization of different river bed substrates and the species composition of floodplains, side arms and oxbow lakes were described in detail in separate sections. The study area

included the whole of the Hungarian Danube stretch.

G.P.

558. Richnovszky, A.

On the mussel fauna of the Hungarian Danube section. (in German)
19. Arbeitstagung der IAD. Sofia. Wissenschaftliche Kurzref.
1979.

Mussel samples were collected from 38 sites along the Hungarian Danube stretch. Six of them were along the Szigetköz section. Eleven of the total twelve species were found at those sites.
The distribution of the mussels and their ecological requirements are also briefly described.

G.P.

559. Rotschein, J. - Antonio, V.

The prediction of water quality changes caused by the Gabcikovo Nagymaros River Barrage System. (in Hungarian)
VIZITERV. Budapest. Manuscript, S-1-30-1/31.
1966.

The chemical and biological status of the Danube was evaluated. The water quality was analysed in correlation with the hydrological conditions and the season. It was basically determined by industrial sewage influents. The effect of oil derivatives was important.
The favourable and unfavourable effects of the storage of water are listed. The extreme proliferation of some organisms (e.g. *Dreissena*) was predicted. Several proposals were also outlined to assure the same level of water quality after the construction of the river barrage system is completed, and it goes into operation.

G.P.

560. Russev, b. K. - Uzunov, J. I.

The zoobenthos and the saprobiological status of the Danube during the international expedition in March, 1988. (in German)
Ergebnisse der Donauexpedition 1988. IAD. Vienna. 209-220.
1990.

The abundance and species composition of the zoobenthos in the main arm of the Danube was studied at 17 sampling sites during the expedition. One of the sites was at Bős (1919 river km). At this site only qualitative sampling was carried out. Five *Oligochaeta*, one *Chironomidae* and one *Nematoda* species were found.

G.P.

561. Schmidt, A. - Kiss, K. T. - Bartalis, T. É.

Chlorococcal algae in the phytoplankton of the Hungarian section of the River Danube in the early nineties.
Biologia, Bratislava, 49: 553-562.
1994.

The Danube is one of the most intensively studied large, eutrophic rivers. This paper presents a short characterisation of the biological water quality based on the data of the period 1990-1992, collected in the Hungarian section of the Danube. Variations in the hydrometeorological features are the most important determinant factors for the actual trophic level of the Danube. There is a good correlation between the chlorophyll-a content and the discharge from early springtime to autumn. Our figures present a definitive increase in the quantity of algae along the Hungarian section; a 10-15 times increase of the algal number is not rare. The density and species number of the coccal green algae start to increase at the end of April and they are the highest from June to October.

K.K.T./B.Á.

562. Simon, T.

The biological programme of the regional monitoring system in the area affected by the Gabcikovo Nagymaros River Barrage System. (in Hungarian)
ELTE. Budapest. Manuscript. 1-86.
1986.

A biological monitoring system was designed and tested. Data from between 1986 and 1991 was collected, processed and evaluated. The monitoring system was based on supersensitive indicator species. The presence and absence of species, changes in the population or community structure were monitored. More information on the environmental effects was gained by the categorization of different organisms according to their water and nutrient requirements, nature conservation values and other factors.

G.P.

563. Simon, T. (ed.)

The biological programme of the regional monitoring system in the area affected by the Gabcikovo Nagymaros River Barrage System. II. 1987. The sampling sites of the biological monitoring system and the results of the basic surveillance in 1987. (in Hungarian)
Manuscript, Budapest, 1-90.
1987.

The species lists of mainly aquatic animal groups collected at botanical sampling sites and those of birds were given.

O.N./B.Á.

564. Soós, Á.

On the Leech Fauna of the Hungarian Reach of the Danube. Danub. Hung. XLIV.
Opusc. Zool. Budapest., 7: 241-257.
1967.

The taxonomic study summarized the results of multiple collections taken mainly in the 1950's and 1960's. The 1243 individual specimens belonged to eleven species and two forms. Samples from the main arm of the Danube between Dunaremete and Mohács (19 sites) and from the Moson Reach (7 sites) were separately evaluated. Three species (*Erpobdella octoculata*, *Glossiphonia complanata*, *Dina lineata*) were predominant in the main arm (80-90 % of the total number of individuals). *Helobdella stagnalis*, which is common in every smaller or greater running water body in Europe, was missing from the main arm of the Danube.

O.N.

565. Szemes, G.

The periphytic algae of pontoons in the Danube. (A qualitative analysis of Bacillariophyceae.) Danub. Hung. XI. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 4:179-215.
1961.

The abundance of diatoms in the periphyton of 32 floating pontoons anchored between Nagymaros and Budapest (Római-fürdő) and Budapest and Mohács was studied. Samples were collected in July, 1958.

O.N.

566. Szemes, G.

The qualitative investigation of planktonic Bacillariophyceae species in the Budapest section of the Danube. Danub. Hung. XIX. (in German)
Acta Bot. Acad. Sci. Hung., 8: 367-440.
1962.

The diatom flora of the Danube at Budapest is described. 66 quantitative samples were collected in 1957-58. The detailed qualitative and quantitative analysis finishes with a description of the seasonal succession and comparisons with other stretches of the river.

O.N.

567. Szemes, G.

Phytoplankton investigations along the Hungarian section of the Danube in summer months. Danub. Hung. XXV. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 7: 169-199.
1964.

The qualitative and quantitative characteristics of the Danube in summer

was investigated at twelve sites from Ásványráró to Mohács from June to August, 1960.
Species lists are presented in tables, detailed drawings are included for identification purposes and the relative abundance of algal taxa along the river was also calculated.

O.N.

568. Szemes, G.

Phytoplankton investigations along the Hungarian section of the Danube in autumn months. Danub. Hung. XXXVIII. (in German)
Opusc. Zool. Budapest, 6: 157-185.
1966.

The qualitative and quantitative characteristics of the Danube in autumn was studied at twelve sites from Ásványráró to Mohács in September and November, 1960.
Species lists are presented in table form, detailed drawings are included for identification purposes and the relative abundance of algal taxa along the river was also calculated.

O.N.

569. Szemes, G.

The phytobenthos of the Danube. (in German)
In: Liepolt, R. (Red.): Limnologie der Donau, 3. Stuttgart. 225-241.
1967.

The benthic algal flora of each Danube section (source region and the Upper Danube, Middle Danube, Lower Danube) is described. It was first of all a qualitative summary. Algae in the periphyton of 42 floating pontoons were also characterized in detail along the Hungarian Danube section.

O.N.

570. Szemes, G.

The phytoplankton of the Danube. (in German)
In: Liepolt, R. (Red.): Limnologie der Donau, 3. Stuttgart. 158-179.
1967.

The phytoplankton of the Danube is discussed from country to country.
The phytoplankton of the Hungarian section was defined with an algal individual number data series taken from 12 sites (Ásványráró 1818 river km etc.) in summer, 1960 and the quantitative analysis of 47 samples from Budapest collected in 1962. The presence or absence of algal taxa was also used to describe the Hungarian section.

O.N.

571. Szemes, G.

The phytoplankton of the Hungarian Reach of the Danube during the winter months. Danub. Hung. XLVI.
Ann. Univ. Sci. Budapest. Sect. Biol., 11: 75-117.
1969.

The qualitative and quantitative characteristics of the Danube in winter was investigated at twelve sites from Ásványráró to Mohács from December, 1960 to February, 1961.
Species lists are presented in table form, detailed drawings are included for identification purposes and the relative abundance of algal taxa along the river was also calculated.

O.N.

572. Tamás, G.

The periphytic microflora of harbour pontoons along the Nagymaros-Római-fürdő Danube section. Danub. Hung. XXVII. (in German)
Ann. Univ. Sci. Budapest. Sect. Biol., 7: 229-240.
1964.

The microflora of the periphyton of harbour pontoons situated between Nagymaros and Római-fürdő along the Danube was qualitatively and semi-quantitatively investigated in 1958. Three species new to Hungary were found among the 110 algae taxa (*Chlorophyta, Cyanophyta, Chrysophyta, Euglenophyta, Rodophyta*).

O.N.

573. T. Bartalis, É.

The results of saprobiological studies along the Hungarian section of the Danube. (in Hungarian)
Vízgazdálkodás és Környezetvédelem (VIZDOK). Budapest, 3: 9-14.
1974.

Spatial and temporal changes in the saprobity of the Danube between 1967 and 1972 were analysed. 12-52 samples were taken annually at ten sites between Rajka and Nagymaros. The Danube was moderately polluted, α-β-mesosaprobic along that section in the period of the study.
A relationship was found between chemical parameters indicating the organic pollution load of the water and the saprobiological status by analysing the weekly samples at Rajka. The eutrophication of the Danube and the relationship between hydrological conditions and trophity are also discussed briefly.

G.P.

574. T. Bartalis, É.

The biological water quality of the Rajka Nagymaros section of the Danube. 1. The multiple uses of the Danube. (in Hungarian)

The Congress of the Hungarian Hydrological Society. '76. Sopron, 1: 1-17. 1976.

The spatial and temporal changes of the biological water quality of the Danube between Rajka and Nagymaros was characterized on the basis of regular hydrobiological surveillance taken since 1967. The conclusions were practically the same as those in another study of the author from 1978.

G.P.

575. T. Bartalis, É.

The biological water quality of the Danube between Rajka and Nagymaros. (in Hungarian)
Hidrol. Közl. Budapest, 58: 311-318.
1978.

Spatial and temporal hydrological changes in the Danube between Rajka and Nagymaros after 1967 were characterized on the basis of the regular study of the saprobiological status, chlorophyll-a content and the abundance of phyto- and zooplankton. The conclusions were the following:

-- The Hungarian Upper Danube was moderately polluted, α-β-mesosaprobic. The continuously increasing organic pollution load reduced the natural self-purification capacity of the river.
-- A great abundance of phytoplankton could develop not only during low water periods but also when the water discharge was close to the mean level for a longer time. Eutrophic water quality threatening the operation of wells along the banks was predicted to occur between March and May and in August-September.
-- The effect of tributaries and sewage inflows could only be detected in short sections along the banks due to dilution. Exceptions were the Vág with its large water discharge and probably the sewage effluent of cities upstream (Bratislava, Vienna). Their effect could be measured at Rajka and Dunaalmás.
-- The abundance and biomass of phyto- and zooplankton increased from Rajka to Esztergom.

G.P.

576. T. Bartalis, É.

The role of the side arm systems in the Szigetköz region in the eutrophication of the Danube. (in Hungarian)
Vízgazdálkodás és Környezetvédelem (VIZDOK). Budapest, 1-2: 6-16.
1978.

The chemical and biological (saprobiological status, chlorophyll-a concentration, the abundance of phyto- and zooplankton and their species composition) water quality of the Danube (Rajka, Medve) and the Szigetköz (Tejfaluszigeti, Cikolaszigeti, Kisbodak-Dunaremete, Ásványráró and Bagoméri side arm system) were studied between three-

nine times in 1976.
The general limnology of the side arms is given with a description of the water level fluctuation, light conditions, water temperature and the nutrient sources. The study described in detail the temporal changes in the structure of the phytoplankton in the Hungarian Upper Danube (1848.4-1806 river m) and in the side arms, the dominant taxa of the different seasons and the determinant environmental factors (water level fluctuation, light conditions, temperature).
On the basis of the species composition of the phytoplankton six different periods could be distinguished in the Danube and four in the side arms.
Structural changes in the zooplankton of the Danube and the side arms were analysed in relationship with the abundance of the phytoplankton, a food source for filter- feeders. After the results are summarized the author also describes the hydrobiological effects of the river barrages on the Danube.

G.P.

577. T. Bartalis, É.

Comparison of the Rajka and Baja transect of the Danube on the basis of some environmental and biological parameters. (in Hungarian)
Hidrol. Közl., 64: 91-97.
1984.

The study analysed the inorganic chemistry and the phytoplankton composition of the Danube. The seasonal changes in the environmental parameters and the biological characteristics and their relationships were also measured. The results could be summarized in the following four statements:

-- A great abundance of phytoplankton could develop in low and mean water discharge periods in the vegetation period along the Hungarian Danube section. The smaller the water discharge, the greater the amount of chlorophyll-a signifying the phytoplankton abundance.
-- According to a linear relationship the chlorophyll-a content was 80-40 mg m^{-3} at a water discharge of 800-2.700 m^3 s^{-1} at Rajka and 154-54 mg m^3 at a water discharge of 1.000-3.000 m^3 s^{-1} at Baja.
-- In practical terms saprobity did not change along the Hungarian section. The saprobity index varied between 2.64 and 2.18 at Rajka, 2.62 and 2.25 at Baja in the temperature range of 3-20 °C so it was α-β-mesosaprobic.
-- The nitrate concentration could reach 3-5 mg dm^{-3} when the water was β-mesosaprobic.
-- The author made the conclusion that the trophic level of the water leaving Hungary was higher than it was when it entered the country mostly due to hydrometeorological reasons. In her opinion the proliferation of planktonic algae was limited by the light, temperature and hydrological conditions as the water contained a large amount of unused inorganic nutrients.

G.P.

578. T. Bartalis, É.

The biological water quality of the Rajka-Nagymaros section of the Danube. (in German)
24. Arbeitstagung der IAD. Szentendre. Wissenschaftliche Kurzref., 1: 203-206.
1984.

Two biological water quality parameters (saprobity, trophity) were measured regularly along the Rajka-Nagymaros section from 1976 to 1983. The effect of tributaries and sewage effluents could only be detected in short sections due to intensive dilution. The degree of saprobity was lower at Almásneszmély and Nagymaros than at Rajka because of the river's natural self-purification. The saprobity of the water did not change at Rajka between 1976 and 1983. The chlorophyll-a concentration of the water, from which the trophity can be determined, increased from Rajka to Nagymaros. No trends could be detected in the changes of the chlorophyll-a concentration during the period of the study.

G.P.

579. T. Bartalis, É.

The biological water quality of the Danube in the Szigetköz region and its backwaters in the floodplain. (in Hungarian)
In: T. Dvihally, Zs. (ed.:) A kisalföldi Duna-szakasz ökológiája. VEAB Publication. Veszprém, 42-76.
1987.

The biological water quality (halobity, trophity, saprobity) of the Szigetköz region and its temporal changes are described on the basis of the hydrological investigations of the main arm (Rajka, Medve) and the side arms (Bagoméri and Ásványrárói side arm, and an oxbow lake and the Kiliti-Cikolai arm outside the flood protection dikes).
The results of the qualitative algological investigation of the Danube at Rajka, the Bagoméri, Ásványrárói and Kiliti-Cikolai arm and the oxbow lake at Dunasziget are presented with a detailed phytoplankton species list table.

G.P.

580. T. Bartalis, É.

Qualitative changes of the phytoplankton in the Rajka transect of the Danube (1848.4 river km) in 1983-86. (in Hungarian)
Hidrol. Közl., 67: 205-213.
1987.

Seasonal changes in the phytoplankton biomass and the chlorophyll-a content were studied in the Danube at Rajka and Baja between 1976 and 1980.
Most of the biomass was produced by *Centrales* diatoms, 10-30 % by *Chlorococcales* green algae.
There was a linear regressive connection between the phytoplankton

biomass and the chlorophyll-a content.
The chlorophyll-a content of the phytoplankton biomass fluctuated between 0.14 and 0.67 % during the vegetation period (diatom predominance) but became higher than 1 % during the winter in the vegetation period.
From biomass and chemical oxygen demand data organic matter responsible for 11-16 % of the COD_k value was estimated to be produced in the river. In those periods the phytoplankton biomass production exceeded 40 kg s^{-1}.

G.P.

581. T. Dvihally, Zs.

Some characteristics of the oxygen budget of the Danube section in the Little Hungarian Plain. (in Hungarian)
In: T. Dvihally, Zs. (ed.): A kisalföldi Duna-szakasz ökológiája. VEAB Publication. Veszprém. 102-118.
1987.

Elements of the oxygen budget, first of all biological oxygen production were studied at Rajka and Bős on the Danube and at three-three sites in the Doborgaszigeti and the Cikolaszigeti side arm system during the vegetation period of 1979-1982.
The conclusions were the following:

-- The side arm system played an important role in the oxygen cycle of the Danube in the Little Hungarian Plain. The nutrient cycling (oxygen production, respiration, degrading processes) was more intensive in the slow flowing side arms. The biological oxygen production and the production/consumption ratio was higher than it was at Rajka, where the river enters Hungary. Downstream to the lower mouth of the side arms the oxygen concentration of the Danube increased, which could be utilised in self-purification processes.

G.P.

582. T. Bartalis, É.

The quality of surface waters. (in Hungarian)
Szigetközi Ankét. Győr, 89-91.
1992.

Studies from the previous fifteen years proved the direct and indirect effects of the water discharge and quality of the Danube on the hydroecological status of all water bodies in the Szigetköz region.
The water quality of that river section is determined by catchment characteristics upstream, the pollution load and environmental protection efforts.
The water quality of the side arms depends on the water level fluctuation. If the water exchange becomes less intensive the side arms become eutrophic, sedimentation occurs and succession towards marsh accelerates.

The water quality of water bodies outside the flood protection dikes are affected by local agricultural practices.

G.P.

583. T. Bartalis, É. - Horváth, I.

On the oxygen concentration and organic pollution load of the Danube between 1484 and 1752 river km in 1989. (in German)
28. Arbeitstagung der IAD. Sofia. Wissenschaftliche Kurzref., 3-6.
1990.

A comparative evaluation of the water quality for four sites on the Danube (Rajka, Medve, Komárom, Dunaalmás) is presented. The parameters studied were water discharge Cr_2O_4 and MNO4 oxygen demand (total and filtered), biological oxygen demand, dissolved oxygen concentration, the level of primary production, chlorophyll-a concentration, the abundance of phytoplankton. Minimum, maximum and mean values are listed in tables.

G.P.

584. Tóth, J.

Changes in the fish stock of the Moson Reach. Danub. Hung. XXXII. (in German)
Opusc. Zool. Budapest, 5: 235-239.
1965.

The quantity of different fish species (carp, pikeperch, catfish, pike, sturgeon, barbel) in the catch on the Moson Reach between 1952-54 and 1961-63 is given in the article.

O.N.

585. Tóth, J.

The importance of side arms. (in Hungarian)
Halászat, 14: 173-174.
1968.

The importance of side arms (Szigetköz, Moson Reach, Tolna, Baja) along the Hungarian Danube (middle reach) for the whole aquatic system and for the fish populations are comprehensively discussed. Aquatic production ("fish food"), overwintering habitats, reproduction, suitable habitat for fish frys and the fishery are included.

O.N.

586. Tóth, J.

The distribution and abundance of pike (Esox lucius L.) in the Hungarian section of the Danube. (in Hungarian)
Halászat, 16: 114-115.

1970.

Side arms, oxbow lakes and slow moving water near river banks considerably increase the population density of pike.
Fishery data between 1950 and 1969 were used to compare fish production in the three Danube sections in Hungary.
The first (1850-1707 river km) includes the Szigetköz. The importance of backwaters is emphasized.

O.N.

587. Tóth, J.

The Distribution of the Stock and the Trend of the Carp Catches in the Hungarian Danube Section. Danub. Hung. LXXI.
Ann. Univ. Sci. Budapest. Sect. biol., 16: 207-215.
1974.

The carp stock in three sections of the Danube in Hungary (1. 1850-1707 river km - the side arms in the Szigetköz and the Moson Reach; 2. 1707-1560 river km; 3. 1560-1433 river km) was estimated for the period between 1950 and 1970 using fishery data.
By the end of the 1960's the carp stock considerably increased, which was promising for the first section, where intensive restocking was also an effective method in the backwaters suitable for overwintering and reproduction.

O.N.

588. Tóth, J.

On the environmental effects of the Gabcikovo Nagymaros River Barrage System and possible ecological problems. (in Hungarian)
Földrajzi Közlemények. Budapest, 31: 1-11.
1983.

The author predicted in detail the ecological changes caused by the operation of the river barrage system with references to the probable changes in the population of fish in the Danube.

G.P.

589. Urbányi, A.

The quality of the groundwater in the Szigetköz region. (in Hungarian)
Szigetközi Ankét. Győr, 157-160.
1992.

The water quality of groundwater monitoring wells had been studied in the Szigetköz since 1987. Wells formed a perpendicular axis with the Danube. Eleven areas were distinguished, 115 wells were investigated. 24 chemical components were measured quarterly.
The quality of the groundwater was actually high in the Szigetköz. Pollution indicating agents (ammonium, nitrite, nitrate, chemical oxygen

demand) were present in small quantities with the exception of several wells i.e. at Ásványráró, which were polluted by ammonium, nitrate and phosphorus.

G.P.

590. Varga, P. - Ábrahám, M. - Simor, J.

The water quality of the Hungarian section of the Danube. (in Hungarian)
Vízügyi Közlemények, 71: 582-598.
1989.

Weekly or fortnightly water quality monitoring on the Danube at 15 sites (five in the Szigetköz) is summarized from the previous twenty years. The water level following sampling method included several biological parameters (algae count, chlorophyll-a concentration, saprobity index, bacteriological parameters) besides the chemical data (ion composition, the amount of nutrient for algae, dissolved oxygen concentration, temperature, biological and chemical oxygen demand, dissolved organic carbon).
The water quality became worse downstream at Gönyű due to the negative effect of the unpurified sewage of Győr being carried by the Moson Reach.

G.P.

591. Várday, N.

The hydrology, hydrography and water chemistry of the Danube in the Little Hungarian Plain. (in Hungarian)
In: T. Dvihally, Zs. (ed.): A kisalföldi Duna-szakasz ökológiája. VEAB Publication. Veszprém, 7-41.
1987.

After the geographical development and the climate of the Szigetköz is discussed together with the hydrological characteristics of the regulated water flows the study describes in detail the characteristics of water chemistry in the Szigetköz.
The following water bodies are included in the water chemical analysis using data from 1980-84:
- the main arm of the Danube (Rajka, Medve);
- Moson Reach (Mecsér, Vének);
- side arms, oxbow lakes, drainage canals, gravel pits.

G.P.

592. Várday, N.

The quality of surface waters in the Szigetköz region. (in Hungarian)
Szigetközi Ankét. Győr, 93-108.
1992.

The water quality of the Szigetköz was studied monthly at water monitoring sites (8 localities) together with the sewage from

Mosonmagyaróvár and Győr. Saprobity, algae count and nearly 30 chemical parameters were measured. Biological and chemical changes due to the permanent or temporary slowing down of the Danube were also simulated.
A detailed analysis was also carried out along and across the Danube during characteristic hydrological and meteorological conditions in 1980.
Altogether approximately 100,000 pieces of data were collected for the region. This data base provides an opportunity to predict most water quality changes due to the different effects.

G.P.

593. Várday, N. - T. Bartalis, É.

Basic surveillance of water quality and impact assessment in the area affected by the Gabcikovo Nagymaros River Barrage System. (in Hungarian)
Hidrológiai Közlöny, 71: 158-157.
1991.

After a short geographical and historical introduction the used water quality evaluation system is described and water quality changes in the Hungarian Upper Danube, the Moson Reach and the side arms in the Szigetköz are established.
The probable effect of the barrage system on the water quality is analysed for each section with its different water quality. After the favourable and unfavourable effects are summarised the following conclusions are made:
-- human impact has considerably altered this environment from its original, wild state therefore its conservation was a questionable goal,
-- if there were no damming at Nagymaros and the river barrage at Bős would continuously generate electricity the worst change in water quality would occur in the Kiliti Reservoir.

G.P.

594. Vida, A.

The Szigetköz region and its ichtyofauna in the view of the changes. 1. (in Hungarian)
Halászat, 5: 157-160.
1990.

The complete fish fauna of the Szigetköz in each water type is described. Their current status is evaluated and the future effect of the barrage system on them was assessed. The data on which the predictions were based had been collected between 1983 and 1990. They represented the whole area and all water types of the Szigetköz.

O.N./B.Á.

595. Vida, A.

The Szigetköz region and its ichtyofauna in the view of the changes. 2. (in Hungarian)

Halászat, 6: 178-179.
1990.

The article includes the first published data on *Hucho hucho* and *Cottus gobio* populations and individuals caught during migration from the Hungarian Danube section since 1986. Several more threatened species were first listed for the area in this article.

O.N./B.Á.

596. Vida, A.

Expected effects of the Gabcikovo river barrage system on the ichtyofauna of the Szigetköz and its values.
Misc. Zool. Hung., (in press)
1993.

The ichtyofaunistical effects of the diversion of the Danube at Dunacs·ny are described and the future of the local fish fauna is predicted. The water types were evaluated according to the number of their threatened fish species.

O.N./B.Á

597. Vida, A.

Threatened fishes of the Szigetköz.
Misc. Zool. Hung., (in press)
1993.

Samples were collected from all water types of the Szigetköz and the similar submontane section of the Rába from 1983 to 1993. The complete fish fauna of the Szigetköz before the diversion of the Danube is discussed and compared to those of other Hungarian and foreign areas. The number and proportion of valuable species proved the ichtyological importance of the Szigetköz.

O.N./B.Á.

598. VITUKI

The effect of the Gabcikovo-Nagymaros River Barrage system on the quality of gallery water. (in Hungarian)
VITUKI. Budapest. Research report. 1-26.
1976.

The water quality of the Danube between Rajka and Nagymaros was evaluated for the period 1968-75. Worsening quality due to river barrages was indicated. Qualitative and quantitative changes were predicted for bank filtered wells. Consequently more effective purification technology should be introduced and new sewage treatment plants should be built on both banks.

The recommendations for the operation included the necessity for the reduction in stagnant water areas.

G.P.

599. VITUKI

The investigation of bank filtering between Gabcikovo and Nagymaros. (in Hungarian)
VITUKI. Budapest. Research report.
1981.

The water quality of six bank filtered wells between Rajka and Dömös was investigated on four occasions. The cadmium and the lead concentration was below 4 % of the maximum acceptable concentrations. At Rajka the mercury concentration exceeded, at Koppánymonostor it nearly reached the acceptable limit. The iron, manganese and zinc concentration nearly reached or even exceeded the standards at some sites at certain occasions. The ammonium and nitrate content was very low at each site.

G.P.

600. VITUKI

The investigation of the water quality effects of the Gabcikovo Nagymaros River Barrage System. (in Hungarian)
VITUKI. Budapest. Research report. 1-46.
1984.

The original level of sixteen chemical compounds was studied at four sites on the Danube and six sites on its tributaries. The 95 % constancy range of the components for 1979-83 was calculated. The polluting effects of the tributaries (e.g. Vág) could easily be proved. Its mineral oil content was especially high resulting in a III. class water quality. The BOD, COD and ammonium values became more favourable, saprobity, NO_3 concentration and the total dissolved solids more unfavourable than they were earlier. Both saprobity and trophity increased downstream. The reduction in the velocity of the current increased the amount of algae present during the vegetation period.

G.P.

601. VITUKI

The investigation of the water quality effects of the Gabcikovo Nagymaros River Barrage System. (in Hungarian)
VITUKI. Budapest. Research report. 7623/3/142.
1984.

The report contains the following:
-- the water quality of the Danube and the analysis of the changes between 1975 and 1984,
-- the most significant pollution sources along the Danube section affected by the Gabcikovo-Nagymaros River Barrage System and their effects on

the water quality,
-- the hydrobiological status of the affected section on the basis of data from literature (Chapter 4.) characterizing the oxygen budget, trophity, saprobity, zooplankton and fish community of the Rajka-Budapest Danube section and the side arm systems in the Szigetköz,
-- the results of the hydrobiological study of the Ásványrárói side arm system and the connected main arm stretch together with those of the disconnected Zátonyi Danube in 1984 (Chapter 5.).

G.P.

602. VITUKI

The investigation of the water quality effects of the Gabcikovo Nagymaros River Barrage System. (in Hungarian)
VITUKI. Budapest. Research report. 1-55.
1985.

The oxygen budget of the Szigetköz side arm systems was balanced. Damming was predicted to have a favourable effect on the BOD but an unfavourable one on the dissolved oxygen content. The pollution of the Morava could be a dominant factor in determining the water quality in the Hrusov Reservoir. Eutrophication could occur in the abandoned river bed. The oxygen production capacity of the periphyton is only 1-2 % of that of the phytoplankton. The decrease in oxygen concentration could lead to anaerobic conditions in the filtering littoral zone. A sharp reduction in pollution on both sides of the river was stressed as being a very important task.

G.P.

603. VITUKI

The effect of the Gabcikovo Nagymaros River Barrage System on the water quality of the Danube. (in Hungarian)
VITUKI. Budapest. Research report. 7614/3/15., 1-81.
1985.

The summarizing report includes a proposal for the development of hydrobiological monitoring of the area affected by the river barrage system and basic data on the hydrobiological status of several water bodies in the Szigetköz.
The physiological pattern of the bacterioplankton was studied together with the structural changes of the phyto- and zooplankton.
The following conclusions were made:
-- the connection with the main arm is the deteminant factor in the coexistence pattern of the phytoplankton in the side arms, when they were separated there was a considerable change in the composition of the planktonic algae flora,
-- immediately after the side arms were separated the phytoplankton biomass of well lit wide side arm sections were higher than those of the Danube,
-- the dominant species of the zooplankton were usually similar in the main arm and the side arms. The species number and the abundance was

higher in the side arms due to a lower current velocity and the temporary development of lentic conditions.
The water quality of the Rajka-Budapest Danube stretch was described on the basis of data collected by water authorities and trends were analysed for the period 1974 to 1983.

G.P.

604. VITUKI

Regional monitoring system of the Gabcikovo Nagymaros Water Barrage System. Water quality evaluation. (in Hungarian)
VITUKI. Budapest. Research report. 7623/3/163. IV.
1987.

The water quality of the Danube and its tributaries was evaluated on the basis of the 1986 data set, the sediment quality by processing 1987 data. The hydrobiological part of the report contains information on six collections at seventeen sampling sites along the Rajka-Budapest Danube section and in the Szigetköz. Phyto- and zooplankton, macroinvertebrates were studied and saprobiological investigations were carried out.

G.P.

605. VITUKI

Regional monitoring system of the Gabcikovo Nagymaros Water Barrage System. Water quality evaluation. B. The structure of the phyto- and zooplankton. (in Hungarian)
VITUKI. Budapest. Research report. 7623/3/970., 1-85.
1987.

The research report deals with two topics.
A. Processing water quality data from regular sampling sites on the Danube and its tributaries.
The water quality of these rivers is described, basic statistical parameters can be found in 228 tables in the second and third volumes. The first volume contains the longitudinal water quality maps of the Danube on the basis of Austrian and Hungarian data. Temporal water quality changes of the Danube and its tributaries were also analysed together with their relationship with the actual hydrological conditions.
B. Phyto- and zooplankton composition studies.
Daily phyto- and zooplankton samples were collected from the Ásványi arm between 20. June and 10. September in 1985. The coexistence pattern of the phytoplankton in the side arm was determined by the water level fluctuation besides the seasonal changes.

G.P.

606. VITUKI

Regional monitoring system of the Gabcikovo Nagymaros Water Barrage System. Water quality evaluation. (in Hungarian)
VITUKI. Budapest. Research report. 5249/1-3., 5258.

1987.

Water quality data from sixteen regular sampling sites on the Danube and ten on different tributaries are presented in the two reports. Altogether 27 chemical components were evaluated, more than 120,000 pieces of data were processed as a function of time and water discharge for 1976-85. The chemistry of the sediment was investigated at 24 sites in 1987.
The reports also contain the results of hydrobiological studies. Phyto- and zooplankton composition studies were carried out daily in the Ásványi arm. Current velocity decrease increased both the abundance and number of species. Phyto- and zooplankton studies and a saprobiological analysis was carried out at seventeen sites along the Rajka-Budapest Danube section and in the side arms.
Two snail species new for the Danube were found in the macrozoobenthos samples.

G.P.

607. VITUKI

A survey for land/inland water ecotone sites in the area affected by the Gabcikovo Nagymaros River Barrage System. (in Hungarian)
VITUKI. Budapest. Research report. 5360., 1-41.
1988.

The coexistence pattern of land/inland water ecotones were used to select suitable sites for the monitoring of spatial and temporal changes caused by the effect of the Gabcikovo Nagymaros River Barrage System on surface and subsurface waters. This network will be suitable for long-term data collection and monitoring. The Dunakiliti Reservoir and several sites from the Szigetköz side arm systems are included in this list.

G.P.

608. VITUKI

Water chemistry, sediment and hydrobiological investigations of the Danube, its tributaries and backwaters. (in Hungarian)
VITUKI. Budapest. Research report. 7612/2/970.
1988.

The water chemical status of the Rajka-Budapest Danube section was evaluated with special emphasis on inorganic and organic micropollutants, micro- and hydrobiological characteristics. Pollutants bonded mostly to small grain-size sediment particles. Hydrobiological parameters were selected to indicate predictable water quality changes in advance.
The biological water quality of the Rajka-Budapest Danube section was characterised on the basis of the coexistence pattern of the phyto- and zooplankton and the benthic macroinvertebrate fauna, the chlorophyll-a concentration and saprobity.
The effect of damming on the inundated organic matter-rich overlying stratum of bank filtering wells was also investigated.
In situ limnocoral experiments were set up to investigate short-term hydrobiological changes while lentic conditions developed. The results

indicated an increase of the abundance and biomass of both the phyto- and zooplankton due to current velocity decrease.

G.P.

609. VITUKI

The hydrobiological status of the Danube section affected by the Gabcikovo Nagymaros River System. (in Hungarian)
VITUKI. Budapest. Research report. 6831-5/3/384., 1-99.
1989.

The phyto- and zooplankton, macroinvertebrates and the ichtyofauna were qualitatively investigated at 97 sites in the Szigetköz in 1987-89. The species lists were processed by multivariant mathematical methods (cluster and correspondence analysis). The following conclusions were made:
-- The taxonomic structure of the phytoplankton in the Danube and in the side arm systems of the Szigetköz were very similar, while they differ considerably from those of other waters which became standing waters a few decades ago. The results support the previous statement that in the side arm systems of the Danube in the Szigetköz with practically no external pollution source the taxonomic structure of the phytoplankton was determined by current velocity and the direct connection with the Danube.
-- Rare algae species for Hungary mainly occurred in waters outside the flood protection dikes. As a consequence, those are important habitats for the maintenance of genetic diversity, which should be protected with an unchanged water regime.
-- Altogether 173 zooplankton taxa were found, 100 *Rotatoria*, 50 *Cladocera* and 23 *Copepoda*. There were rare species among them, which have been found in Hungary only at a few sites and on a few occasions.
-- The macrozoobenthos communities of intensively silted up habitats can be damaged by relatively small decreases in water level.
-- The side arm systems play an important role in the reproduction of Danubian fish species, the isolation of the side arms leads to the decline of the ichtyofauna.

G.P.

610. VITUKI

Sediment water chemistry and hydrobiological investigations of the Danube, its tributaries and side arms. (in Hungarian)
VITUKI. Budapest. Research report. 7612/3/970., 1-159.
1989.

The following were investigated and evaluated along the Rajka-Budapest Danube section in 1989:
-- organic micropollutants and the mutagenity of the Danube,
-- toxic and organoleptic elements,
-- the microbiological status of the sediment and the water of the Danube (hygienic and metabolic investigations),

-- probable changes in the heavy metal transport,
-- the potential heavy metal pollution and the microbiological status of bank filtered water sources,
-- hydrobiological status (phytoplankton, zooplankton, macrozoobenthos, saprobity).
The report includes an overview on water quality changes during bank filtering and each step is described qualitatively.
Physiological experiments on algae were used to reveal the trophic potential of the Danube, the limiting factors on algal reproduction and the competition between cyanobacteria and green algae.
The aim of the study was the elucidation of the water quality effects of the Gabcikovo Nagymaros River Barrage System and the collection of basic information necessary for setting up a water quality monitoring system.

G.P.

611. VITUKI

Nutrient cycling studies on the probable trophic conditions of the Dunakiliti Reservoir. (in Hungarian)
VITUKI. Budapest. Research report. 716/3/1310., 1-120.
1989.

The aim of the study was the evaluation of existing hydrological, meteorological and water quality data from a metabolic point of view, estimating the eutrophication of the Dunakiliti Reservoir using on site and laboratory experiments together with a qualitative and quantitative description of biological metabolic processes in the reservoir. A mathematical model was developed to describe algae biomass changes. It produced results very similar to the measured data.
Results from the main arm of the Danube and the Ásványráró side arm indicated that the storage of water improves the environmental conditions for algal reproduction. Biological activity measurements were carried out three times a week indicating the probable increasing effect the reduction of current velocity would have on biological activity. It accelerates metabolic processes.
The compilation of the algae and cyanobacterium base data was begun. Investigating the phosphorus metabolism of cyanobacteria their phosphorus accumulation ability turned out to provide an evolutionary advantage as they are able to reproduce in a phosphorus-poor environment by using up their reserves.
Physiological experiments with many different algae proved that six days are sufficient to reach the maximum chlorophyll-a concentration under optimal conditions. This period is equal to the retention time of the water at the sides of the Dunakiliti reservoir when the water level is low.

G.P.

612. VITUKI

The hydrobiological investigation of the Hungarian Upper Danube. (in Hungarian)
VITUKI. Budapest. Research report. 7613/3/2059., 1-52.
1991.

The hydrobiological status of the Hungarian Upper Danube (Rajka-Budapest) was investigated in 1991 together with the development of lake-like conditions in an in situ experiment.
On the basis of the coexistence pattern of the phyto- and zooplankton and the macro invertebrates the investigated section could be divided into two parts in connection with the current velocity.
The determinant effect of water level fluctuation on the structure of the phyto- and zooplankton in the side arm systems of the Szigetköz region was indicated in situ limnocoral experiments, in which the hydrobiological changes of isolated Danube water was measured.
On the basis of previous daily sample series (VITUKI 1985) and two on site experiments (VITUKI, 1988, 1991) the conclusion was made that any effect decreasing the current velocity of the Danube leads to eutrophication and fast and unpredictable structural changes in the planktonic communities.

G.P.

613. VITUKI

Studies on bank filtered water resources areas, subsurface water supply and biological nutrient cycling of the Danube and the Szigetköz region. II. Nutrient cycle studies on the Danube and in the Szigetköz region. (in Hungarian)
VITUKI. Budapest. Research report.
1991.

The authors selected four research subjects:
They set up a water quality model to describe changes in the biomass of algae between two remote transects of the river even taking into consideration longer-term periods.
Nutrient cycle studies included carbon, nitrogen (nitrification, denitrification, bacterial decomposition) and phosphorus (phosphorus adsorption and desorption of the sediment, phosphorus uptake of the plankton). Separate studies were made in the main arm and in a side arm in the Szigetköz, Koppánymonostor, Esztergom-Szentkirályi and Esztergom-Primás island areas. Water chemical bacteriological and limnological studies were carried out. Special emphasis was given to micropollutants and heavy metals.
The investigation of the underground water resources in the Szigetköz region was primarily organised according to the predictable effects of the Gabcikovo Nagymaros River Barrage System.
The protection of this water resource of increasing value is a real and important problem.
However, at present there are no available water quality tracing results or overall data on the transport processes in the lower layer of the gravel bed, which could help to model these processes.

G.P.

614. VITUKI

Changes in the water quality of surface and groundwater resources and the aquatic ecosystems due to the operation of the C variant. (in Hungarian)

VITUKI. Budapest. Research report. 713/2/2459. I. 1-63. II. 1-83.
1993.

The aim of the study, published in two volumes, is the investigation of surface and groundwater quality effects of the operation and running conditions of the C variant in the Szigetköz region and the analysis and prediction of the fate of bank filtered water supply along the Danube together with the water quality of the Danube at Budapest.
Volume I. contains the description of hydrological effects, suspended matter transport, water quality changes, eutrophication and probable water quality changes of subsurface waters together with conclusions and recommendations.
The second volume introduces the hydrobiological study of the Szigetköz, the hydrobiological effects of water level fluctuation and the hydrobiological study of the Danube between Rajka and Budapest, evaluating the ecological effects. It contains recommendations for the development of ecologically favourable conditions in water bodies in the Szigetköz region.

G.P.

615. Vranovsky, M.

Zooplankton studies in the Zofin (1836 river km) and Bacianske side arm of the Danube. (in Hungarian)
In: T. Dvihally, Zs. (ed.): A kisalföldi Duna-szakasz ökológiája. VEAB Publication. Veszprém, 148-161.
1987.

The species composition and biomass of the *Rotatoria*, *Cladocera* and *Copepoda* plankton was studied in the Zofin and Bacianske side arms of the Danube (Csallóköz) in 1971-73.
The wet weight equivalent of the average biomass was 10,400 mg m-3. *Rotatoria* produced 80 %, *Cladocera* 10 %, *Copepoda* 6 % and *Protozoa* 3 % of the total biomass.
The dominant species were the following: *Asplancha* genus, *Polyarthra* genus, *Keratella cochlearis*, *Bosmina longirostris*, *Thermocyclops oithonoides*. With two exceptions the zooplankton biomass was always higher in the side arms than in the main arm. The individual number was 11-26 times, the biomass 20-90 times higher in the side arms than in the main arm. The total biomass of the complete Bacianske side arm system was estimated to be around 125 ton wet weight between July and October, 1971.
The biomass in the Zofin side arm was 20-35 times higher than the aforementioned figure. A correlation was found between the zooplankton biomass and the abundance of fish.
The greater zooplankton biomass enriches the food resource of fish in the main arm when it is flushed out from the side arms.

G.P.

ECONOMIC AND SOCIAL IMPACTS

Agriculture

616. Bálint, S. - Czencz, F. - Palkovits, G. - Schummel, P

Summary of obseving the effects of Bős-Nagymaros barrage on agriculture in the years 1980-88. (in Hungarian)
Mosonmagyaróvár, pp. 1-59. (maps attached) Pannon University of Agricultural Sciences, Department of Production Development Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1989.

Result of surveying the effected agricultural region are evaluated and presented in charts (started in 1986) in the section of Gönyű Dömös and (started in 1980) in the region of Szigetköz.
Topics: reanfall, depth of ground-water, structure of sowing, irriration, yields, supply of nutrients, plant protection etc. Summary of conclusions.

S.P.

617. Bálint, S. - Csapó, F.-né, Czencz, F. - Palkovits, G. - Schummel, P. Venesz, B.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1985. (in Hungarian)
Mosonmagyaróvár, p.p. 1-66. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV (Hydrological Planning Institution).
1986.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 484 plots on 19.131 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea, alfalfa and sunflower.
The survey programme covered 17 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

618. Bálint, S. - Palkovits, G.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1983. (in Hungarian)
Mosonmagyaróvár, p.p. 1-70. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1984.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 452 plots on 19.248 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea, alfalfa and sunflower.

The survey programme covered 17 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

619. Bálint, S. - Palkovits, G. - Czencz, F. - Szücs, M. - Schummel, P. - Venesz, B.

Study of how the regulation of ground-water-level influenced the land use in the Szigetköz section of the power plant GNV. (in Hungarian)
Mosonmagyaróvár, pp. 1-70. (enclosed are: maps, report on soil segment opening up, soil analyses data-sheets; results of analyses of crops for purposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1986.

Regular phenological observations have been started in 1985 after opening up soil segments on 41 sites in the neighbourhood of 38 ground-water observatory wells in Szigetköz. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

Cs.F.-né

620. Bálint, S. - Palkovits, G. - Czencz, F. - Szücs, M. - Schummel, P. - Venesz, B.

Study of how the regulation of ground-water-level influenced the land use in the Szigetköz section of the power plant GNV. (in Hungarian)
Mosonmagyaróvár, pp. 1-79. (enclosed are: maps, report on soil segment opening up, soil analyses data-sheets; results of analyses of crops for purposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1987.

Regular phenological observations have been started in 1986 after opening up soil segments on 41 sites in the neighbourhood of 38 ground water observatory wells in Szigetköz. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

Cs.F.-né

621. Bálint, S. - Palkovits, G. - Schummel, P.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1980. (in Hungarian)
Mosonmagyaróvár, p.p. 1-40 (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production

Development Department. Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1981.
Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 442 plots on 18.730 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea and alfalfa.
The survey programme covered 17 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

622. Bálint, S. - Palkovits, G. - Schummel, P.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1981. (in Hungarian)
Mosonmagyaróvár, p.p. 1-30 (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1981.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 464 plots on 18.886 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea and alfalfa.
The survey programme covered 17 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

623. Bálint, S. - Palkovits, G. - Schummel P.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1982. (in Hungarian)
Mosonmagyaróvár, p.p. 1-54. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1982.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 444 plots on 18.491 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea and alfalfa. The survey programme covered 17 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

624. Bálint, S. - Palkovits, G. - Schummel, P. - Venesz, B. - Czencz, F. - Csapó, F.-né.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1984. (in Hungarian)
Mosonmagyaróvár, p.p. 1-68. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1985.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 470 plots on 19.074 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea, alfalfa and sunflower.
The survey programme covered 17 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

625. Bálint, S. - Palkovits, G. - Szücs, M. - Schummel, P. - Venesz, B.

Study of how the regulation of ground water-level influenced the land use in the Szigetköz section of the power plant GNV. (in Hungarian)
Mosonmagyaróvár, pp. 1-76. (enclosed are: maps, report on soil segment opening up, soil analyses data-sheets; results of analyses of crops for purposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1985.

Regular phenological observations have been started in 1984 after opening up soil segments on 42 sites in the neighbourhood of 38 ground-water observatory wells in Szigetköz. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

Cs.F.-né

626. Czencz, F. - Palkovits, G. - Schummel, P. - Reiter, J. - Szücs, M.

Study of how the regulation of ground-water-level influenced the land use in the Szigetköz section of the power plant GNV 1987. (in Hungarian)
Mosonmagyaróvár, pp. 1-77. (enclosed are: maps, report on soil segment opening up, soil analyses data-sheets; results of analyses of crops for purposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV (Hydrological Planning Institution)
1988.

Regular phenological observations have been started in 1987 after

opening up soil segments on 40 sites in the neighbourhood of 38 ground water observatory wells in Szigetköz. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

T.S.-né

627. Czencz, F. - Palkovits, G. - Schummel, P. - Reiter, J. - Szücs, J.

Study of how the regulation of ground-water-level influenced the landuse in the Szigetköz section of the power plant GNV in 1988. (in Hungarian) Mosonmagyaróvár, pp. 1-106. (enclosed are: maps, report on soil segment opening up, soil analyses data-sheets; results of analyses of crops for purposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution) 1989.

Regular phenological observations have been started and continued in 1988 at site of the ground-water observatory wells in Szigetköz. 25 of them were observed and 4 as controls outside the affected area, as well as 17 in the affected area of Gönyű-Nagymaros and its 4 control sites were also observed. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

T.S.-né

628. Czencz, F. - Palkovits, G. - Schummel, P. - Reiter, J. - Csapó, F.-né.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1988. (in Hungarian) Mosonmagyaróvár, p.p. 1-75. (maps and computerized data processing sheets) Pannon Univesity of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution). 1989.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 904 plots on 20.028 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea, seed pea, alfalfa and sunflower.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

629. Czencz, F. - Schummel, P. - Palkovits, G. - Csapó, F.-né. - Reiter, J.

Report on the situation of irrigation and irrigation possibilities in the region of Szigetköz in 1988. (in Hungarian)

Mosonmagyaróvár, pp. 1-12. Pannon University of Agricultural Sciences, Department of Production Development Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1989.

It involves the irrigation possibilities per large-scale plots and per water-wells in Szigetköz as well as the actual irrigation. It is then arranged into groups according to year, farm, sort of plants and water-well and evaluated and analysed in data processing. Number of irrigators is recorded per type.

S.P.

630. Czencz, F. - Schummel, P. - Palkovits, G. - Csapó, F.-né. - Reiter, J.

Report on the situation of irrigation and irrigation possibilities in the region of Szigetköz in 1989. (in Hungarian)
Mosonmagyaróvár, pp. 1-16. Pannon University of Agricultural Sciences, Department of Production Development Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1990.

It involves the irrigation possibilities per large-scale plots and per water-wells in Szigetköz as well as the actual irrigation. It is then arranged into groups according to years, farm, sort of plants and water-well and evaluated and analysed in data processing. Number of irrigators is recorded per type.

S.P.

631. Czencz, F. - Schummel, P. - Palkovits, G. - Csapó, F.-né. - Reiter, J.

Preliminary report on the situation of irrigation and irrigation possibilities in Szigetköz in 1990. (in Hungarian)
Mosonmagyaróvár, pp. 1-20. Pannon University of Agricultural Sciences, Department of Production Development Mosonmagyaróvár and VIZITERV. (Hydrological Panning Institution).
1990.

It involves the irrigation possibilities per large-scale plots and per water-wells in Szigetköz as well as the actual irrigation. It is then arranged into groups according to years, farm, sort of plants and water-well and evaluated and analysed in data processing. Number of irrigators is recorded per type.

S.P.

632. Késmárki, I. - Halupa, L. - Palkovits, G.

Connection of forest-community and field-growing of plants with water. (in German)
Symposium: "Wasser im Pannonischen Raum", Sopron, pp. 197-203 (18th May 1993).
1993.

Analyses of connection of water with the vegetation and with the soil in Szigetköz have been conducted at the Mosonmagyaróvár Faculty of the Pannon University of Agricultural Sciences and at the Scientific Institution of Forestry since 1980.
The results of the 12-year research work on field-growing of plants and forestry are illustrated by charts and maps.

S.P.

633. Késmárki, I. - Szabó, J. - Czencz, F. - Frint, G.

Report on the situation of irrigation and irrigation possibilities in the region of Szigetköz in the years 1980-1987. (in Hungarian)
Mosonmagyaróvár, pp. 1-21. Pannon University of Agricultural Sciences, Department of Plantgrowing, Department of Production Development and VIZITERV. (Hydrological Planning Institution).
1987.

It involves the irrigation possibilities per large-scale plots and per water-wells in Szigetköz as well as the actual irrigation. It is then arranged into groups according to years, farm, sort of plants and water-well and evaluated and analysed in data processing. Number of irrigators is recorded per type.

S.P.

634. Nebehaj, I. - Tuller, L.

Report on continuous records of relative moisture content of the soil in the affected area of the power plant (GNV). (in Hungarian)
Mosonmagyaróvár, pp. 1-7. (find enclosed: data-sheet of the moisture content recordings per place of measurement and their graphs) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1989.

Evaluation of ground-water fluctuation and results of observations made every two weeks from June in 1989 at the sites of soil moisture content recordings established near the 25 ground-water observatory wells in the section between Gönyű and Nagymaros and near 43 wells in Szigetköz.

T.S.-né

635. Nebehaj, I. - Tuller, J.

Report on continuous records of moisture content of the soil in the affected area of the mutual Danube barrage in 1990. (in Hungarian)
Mosonmagyaróvár, pp. 1-16. (find enclosed: data-sheet of the moisture content recordings per place of measurement and their graphs) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1990.

Evaluation of ground-water fluctuation and results of observations made

every two weeks in 1989 at the sites of soil moisture content recordings established near the 24 ground-water observatory wells in the section between Gönyű and Nagymaros and near 66 wells in Szigetköz.

T.S.-né

636. Palkovits, G.

Research results of agricultural and soil-analyses in Szigetköz. (in Hungarian)
Conference organized by the Hungarian Hydrological Association, Győr, pp. 161-178. (25-26. May 1992).
1991.

Record of condition about plant growing in the region started in 1980 and continued year after year based on agrotechnical data of agricultural large-scale plots. The data were completed by results of soil-, ground-water depth and meteorological analyses and were processed on the basis of 19 computer programmes. The evaluation is completed by charts of results.

S.P.

637. Palkovits, G. - Schummel, P.

Research results of plant growing in Szigetköz. (in Hungarian)
Acta Ovariensis, Mosonmagyaróvár, 34: 75-87.
1992.

Record of condition about plant growing in the region started in 1980 and continued year after year based on agrotechnical data of agricultural large-scale plots. The data were completed by results of soil-, ground-water depth and meteorological analyses and were processed on the basis of 19 computer programmes. The evaluation is completed by charts of results.

S.P.

638. Palkovits, G. - Schummel, P.

Evaluation of environmental condition in the region of Upper-Danube (in the period between 1986-1992) 4. Recording of soil condition. (in Hungarian)
Mosonmagyaróvár, pp. 1-22. (find enclosed. charts, diagrams of soil moisture content at some sites of measurement and maps), Pannon Unviersity of Agricultural Sciences.
Department of Production Development Mosonmagyaróvár and KGI - Institution of Environmental Management, Budapest.
1993.

The physical and hydrological characteristics of the soil at the sites of observations were analised after opening up the segments.

On the basis of the results some research work was made how soil types, phreatic fluctuations, rainfall and other climatic factors affect the moisture content of the soil. Suggestions.

S.P.

639. Palkovits, G. - Schummel, P.

Evaluation of environmental condition in the region of Upper-Danube (in the period between 1986-1992) (in Hungarian)
7. Records of agricultural landuse.
Mosonmagyaróvár, pp. 1-21 (find enclosed. charts, figures, maps and tableaus of data processing), Pannon Unviersity of Agricultural Sciences, Production Development Department Mosonmagyaróvár and KGI Budapest (Institution for Environmental Management)
1993.

Computerized data registration and evaluation of results of agrotechnological, soil-science, depth of ground-water and technological analyses per large-scale plots and per crop during the above mentioned period of seven years. The report includes conclusions and some suggestions.

S.P.

640. Palkovits, G. - Schummel, P. - Czencz, F. - Bálint, S. - Csapó, F.-né.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1986. (in Hungarian)
Mosonmagyaróvár, p.p. 1-69. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1987.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 549 plots on 19.447 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea, alfalfa and sunflower.
The survey programme covered 17 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

641. Palkovits, G. - Schummel, P. - Czencz, F. - Bálint, S. - Reiter, J.

Evaluation of crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1986. (in Hungarian)
Mosonmagyaróvár, p.p. 1-57. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).

1987.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 15 farms in Szigetköz. Data base: 543 plots on 21.417 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, green pea, seed pea, alfalfa, sunflower, oil flax and mustard.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

642. Palkovits, G. - Schummel, P. - Csapó, F.-né. Czencz, F. - Tóth, S.-né.

Report on he present circumstances of agricultural land use in Szigetköz 1991. (in Hungarian)
Mosonmagyaróvár, p.p. 1-43. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1991.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large- scale acrage in 8 farms in Szigetköz. Data base: 910 plots on 20.298 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, green pea, seed pea, alfalfa and sunflower.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

643. Palkovits, G. - Schummel, P. - Csapó, F.-né. - Czencz F. - Tóth, S.-né.

Report on the present circumstances of agricultural land use in Szigetköz by Duna Monitoring environmental data-collecting and information system 1992. (in Hungarian)
Mosonmagyaróvár, p.p. 1-46. (maps and computerized data processing sheets) Pannon University of Agricultural Scinces, Production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection.
1993.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 13 farms in Szigetköz. Data base: 935 plots on 20.212 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, green pea, seed pea, alfalfa and sunflower.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

644. Palkovits, G. - Schummel, P. - Csapó, F.-né. - Czencz, F. - Tóth, S.-né.

Report on the present circumstances of agricultural land use in Szigetköz by Duna Monitoring environmental data-collecting and information system 1993. (in Hungarian)
Mosonmagyaróvár, pp. 1-37. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection.
1994.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 17 farms in Szigetköz. Data base: 857 plots on 18.719 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, green pea, seed pea, alfalfa and sunflower.
The survey programme dovered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

645. Palkovits, G. - Schummel, P. - Csapó, F.-né. - Czencz, F. - Tóth, S.-né.

Report on agricultural land use in the river section below Gönyű under the present circumstances 1991. (in Hungarian)
Mosonmagyaróvár, p.p. 1-39. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1991.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 11 farms in Szigetköz. Data base: 512 plots on 18.076 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, seed pea, alfalfa, sunflower, oil flax and mustard.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

646. Palkovits, G. - Schummel, P. - Csapó, F.-né. - Czencz, F. - Tóth, S.-né.

Report on agricultural land use in the river section below Gönyű under the present circumstances by Duna Monitoring environmental data-collecting information system 1992. (in Hungarian)
Mosonmagyaróvár, p.p. 1-34. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection.
1992.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 9 farms in Szigetköz. Data base: 361 plots on 12.477 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, seed pea, alfalfa, sunflower, oil flax and mustard.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

647. Palkovits, G. - Schummel, P. - Csapó, F.-né. - Czencz, F. - Tóth, S.-né.

Report on agricultural land use in the river section below Gönyű under the present circumstances by Duna Monitoring environmental data-collecting information system 1993. (in Hungarian)
Mosonmagyaróvár, p.p. 1-25. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection.
1994.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 7 farms in Szigetköz. Data base: 256 plots on 8.744 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, seed pea, alfalfa, sunflower, oil flax and mustard.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

648. Palkovits, G. - Schummel, P. - Czencz, F. - Reiter, J. - Csapó, F.né.

A report on crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1987. (in Hungarian)
Mosonmagyaróvár, p.p. 1-68. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1988.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large- scale acrage in 8 farms in Szigetköz. Data base: 864 plots on 19.727 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea, seed pea, alfalfa and sunflower.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

649. Palkovits, G. - Schummel, P. - Czencz, F. - Reiter, J. - Csapó, F.-né.

Evaluation of crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1987. (in Hungarian)
Mosonmagyaróvár, p.p. 1-56. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1988.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 15 farms in Szigetköz. Data base: 551 plots on 20.969 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, green pea, seed pea, alfalfa, sunflower, oil flax and mustard.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

650. Palkovits, G. - Schummel, P. - Czencz, F. - Reiter, J. - Bálint, S. - Csapó, F.-né.

Evaluation of crop technology and yields in the section of Szigetköz affected by the power plant (GNV) in 1988. (in Hungarian)
Mosonmagyaróvár, p.p. 1-60. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1989.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 15 farms in Szigetköz. Data base: 578 plots on 21.047 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, seed pea, alfalfa, sunflower, oil flax and mustard.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

651. Palkovits, G. - Schummel, P. - Csapó, F.-né. - Tóth, S.-né. - Tuller, L. - Szücs, M.

Report on phenological observations in the observatory system of the Danube barrage in 1991. (in Hungarian)
Mosonmagyaróvár, pp. 1-111. (find enclosed: data-list of phenological and plant-health observations, maps, data-sheets of soil analysis and results of crop sample analyses for purposes of bakery, feeding and sugar industry) Pannon University of Agricultural Sciences, production Development Department Mosonmagyaróvár and VIZITERV.

1991.

Regular phenological observations have been continued in 37 observatory wells in Szigetköz and at 13 observatory sites in the section below Gönyű. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

T.S.-né

652. Palkovits, G. - Schummel, P. - Csapó, F.-né, - Tóth, S.-né. - Tuller, L. - Szücs, M.

Report on the phenological observations and their evaluation in the frame of the Danube Monitoring system in 1992. (in Hungarian)
Mosonmagyaróvár, pp. 1-84. (find enclosed: data-list of phenological and plant-health observations, maps, data-sheets of soil analysis and results of crop sample analyses for purposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection.
1992.

Regular phenological observations have been continued in 40 observatory wells in Szigetköz and at 13 observatory sites in the section below Gönyű. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

T.S.-né

653. Palkovits, G. - Schummel, P. - Csapó, F.-né. - Tóth, S.-né. - Szücs, M.

Report on the phenological observations and their evaluation in the frame of the Danube Monitoring system in 1993. (in Hungarian)
Mosonmagyaróvár, pp. 1-57. (find enclosed: data-list of phenological and plant-health observations, maps, data-sheets of soil analysis and results of crop sample analyses for purposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection Győr.
1994.

Regular phenological observations have been continued in 40 observatory wells in Szigetköz and at 8 observatory sites in the section below Gönyű. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

T.S.-né

654. Palkovits, G. - Schummel, P. - Reiter, J. - Csapó, F.-né. - Czencz, F.

Preliminary report on agriculture land use in the second section under the

present circumstances 1990. (in Hungarian)
Mosonmagyaróvár, p.p. 1-37. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological planning Institution).
1990.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 15 farms in Szigetköz. Data base: 584 plots on 20.630 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, seed pea, alfalfa, sunflower, oil flax and mustard.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

655. Palkovits, G. - Schummel, P. - Reiter, J. - Csapó, F.-né, Czencz, F.

A report on crop technology and yields in the first section of Szigetköz affected by the power plant (GNV) in 1989. (in Hungarian)
Mosonmagyaróvár, p.p. 1-68. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1990.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 8 farms in Szigetköz. Data base: 928 plots on 20.601 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, green pea, seed pea, alfalfa and sunflower.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

S.P.

656. Palkovits, G. - Schummel, P. - Reiter, J. - Csapó, F.-né - Czencz, F.

Preliminary report on agricultural land use in the first section in 1990. (in Hungarian)
Mosonmagyaróvár, p.p. 1-34. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1990.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large- scale acrage in 8 farms in Szigetköz. Data base: 939 plots on 20.355 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, potato, cabbage, green pea, seed pea, alfalfa and sunflower.

The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

657. Palkovits, G. - Schummel, P. - Reiter, J. - Csapó, F.-né, Tóth, S.-né. - Szücs, M.

Preliminary report on observations made at the sample-sites in the neighbourhood of the ground-water observatory wells in 1990. (in Hungarian)
Mosonmagyaróvár, pp. 1-134. (enclosed are: maps, report on soil segment opening up, soil analyses data-sheets; results of analyses of crops for pruposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution).
1990.

Regular phenological observations have been continued at site of the ground-water observatory wells in Szigetköz. 25 of them were observed and 4 ad controls outside the affected area, as well as 17 in the affected area of Gönyű-Nagymaros and its 4 control sites were also observed. The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

T.S.-né

658. Palkovits, G. - Schummel, P. - Reiter, J. - Csapó, F.-né. - Venesz, B. - Molnár, Zs. - Tóth, S.-né. - Czencz, F.

A report on crop technology and yields in the second section of affected by the power-plant (GNV) in 1989. (in Hungarian)
Mosonmagyaróvár, p.p. 1-53. (maps and computerized data processing sheets) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution) (Published in one volume together with report on similar topics about Szigetköz).
1990.

Computerized data processing of crop yields including agrotechnological soil science and technological data of the following plants produced on large-scale acrage in 15 farms in Szigetköz. Data base: 584 plots on 20.990 hectares: wheat, winter barley, spring barley, maize, silage maize, sugar beet, seed pea, alfalfa, sunflower, oil flax and mustard.
The survey programme covered 19 topics, and analized the effect of each factor on the yield. The analysis included weather and ecological circumstances as well.

P.G.

659. Palkovits, G. - Schummel, P. - Reiter, J. - Szücs, M.

Study of how the regulation of ground-water-level influenced the land use in the Szigetköz section of the power plant GNV in 1989. (in Hungarian)
Mosonmagyaróvár, pp. 1-87. (enclosed are: maps, report on soil segment opening up, soil analyses data-sheets; results of analyses of crops for puposes of bakery, feeding and sugar industry), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1990.

Regular phenological observations have been continued at site of the ground-water observatory wells in Szigetköz 25 of them were observed and 4 as controls outside the affected area, as well as 17 in the affected area of Gönyű-Nagymaros and its 4 control sites were also observed.

The study analyzes the effects of phreatic fluctuations, the effects of soil- and other ecological circumstances and evaluates their relation to the yield and quality of the cultivated plants.

T.S.-né

660. Palkovits, G. - Tuller, L. - Schummel, P. - Tóth, S.-né. - Csapó, F.-né.

Report on continuous records of moisture content of the soil in the affected area of the mutual Danube barrage in 1991. (in Hungarian)
Mosonmagyaróvár, pp. 1-9. (find enclosed: data-sheet of the moisture content recordings per place of measurement and their graphs) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1991.

Evaluation of ground-water fluctuation and results of observations made about every two weeks in 1991 at the sites of soil moisture content recordings established near the 16 ground-water observatory wells in the section of Gönyű and Tát, and near 90 wells in Szigetköz.

T.S.-né

661. Palkovits, G. - Tuller, L. - Schummel, P. - Tóth, S.-né. - Csapó, F.-né.

Report on soil moisture content records of the Danube Monitoring Environmental Data-collecting and Information System in 1992. (in Hungarian)
Mosonmagyaróvár, pp. 1-17. (find enclosed: data-sheet of the moisture content recordings per place of measurement and their graphs) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection.
1992.

Evaluation of ground-water fluctuation and results of observations made about every two weeks in 1992 at the sites of soil moisture content recordings established near the 16 ground-water observatory wells in the

section of Gönyű and Tát, and near 41 wells in Szigetköz.

T.S.-né

662. Palkovits, G. - Schummel, P. - Tóth, S.-né. - Csapó, F.-né.

Report on soil moisture content records of the Danube Monitoring Environmental Data-collecting and Information System in 1993. (in Hungarian)
Mosonmagyaróvár, pp. 1-11. (find enclosed: data-sheet of the moisture content recordings per place of measurement and their graphs) Pannon University of Agricultural Sciences, production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection.
1993.

Evaluation of ground-water fluctuation and results of observations made about every two weeks in 1993 at the sites of soil moisture content recordings established near the 16 ground-water observatory wells in the section of Gönyű and Tát, and near 41 wells in Szigetköz.

T.S.-né

663. Palkovits, G. - Schummel, P. - Tóth, S.-né. - Csapó, F.-né.

Report on soil moisture content records of the Danube Monitoring Environmental Data-collecting and Information System in 1993. (in Hungarian)
Mosonmagyaróvár, pp. 1-11. (find enclosed: data-sheet of the moisture content recordings per place of measurement and their graphs) Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and North-Transdanubian Supervisory Authority for Environmental Protection.
1993.

Evaluation of ground-water fluctuation and results of observations made about every two weeks in 1993 at the sites of soil moisture content records established near the 11 ground-water observatory wells in the section of Gönyű and Dunaalmás, and near 45 wells in Szigetköz.

T.S.-né

664. Szücs, M.

Report on soil-analyses made in the affected area of Szigetköz in 1983-84 (by power-plant Bős-Nagymaros) (in Hungarian)
Mosonmagyaróvár p.p. 1-104. (find enclosed: 20 data-sheets containing the results of soil-analyses), Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1984.

Description of 40 soil segments opened up in Szigetköz and evaluation of results, conclusions made on the basis of the results achieved by

analysing the following features of 600 touched and 435 untouched soil samples of original texture: TVG, moisture vontent, mechanical composition, micro-aggregate, differential prosity, and hydraulic conductivity.

Cs.F.-né

665. Szücs, M. - Palkovits, G.

Report on soil analyses made in the region affected by the regulation of ground-water level in 1986. (in Hungarian)
Mosonmagyaróvár p.p. 1-69. Pannon University of Agricultural Sciences, Production Development Department Mosonamgyaróvár and VIZITERV. (Hydrological Planning Institution)
1987.

Description of 15 opened up in Szigetköz and evaluation of results, conclusions made on the basis of the results achieved by analysing the following features of 142 touched and 239 untouched soil samples of original texture: moisture content, mechanical composition, micro-aggregate, differential porosity, and hydraulic conductivity.

Cs.F.-né

666. Szücs, M. - Palkovits, G.

Report on soil analyses made in the region affected by the regulation of ground-water level in 1987. (Soil-segments 16-30) (in Hungarian)
Mosonmagyaróvár, p.p. 1-69. Pannon University of Agricultural Sciences, Production Development Department Mosonamgyaróvár and VIZITERV. (Hydrological Planning Institution)
1987.

Description of 4 opened up soil-segments and their 3 controls, as well as 7 soil-segments in the lower section and their one control opened up in Szigetköz; evaluation of results, conclusions made on the basis of the results analysing the following features of 246 touched and 219 untouched soil samples of original texture: moisture content, mechanical composition, micro-aggregate, differential porosity, and hydraulic conductivity.

Cs.F.-né

667. Szücs, M. - Palkovits, G.

Report on soil analyses made in the affected area of Szigetköz (Power-plant Bős-Nagymaros) in 1987. (Soil-segments 31-44) (in Hungarian)
Mosonmagyaróvár, pp. 1-64. Pannon University of Agricultural Sciences, production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1987.

Description of 2 opened up soil segments and its 1 control, as well as 11 in the lower section opened up in Szigetköz; evaluation of results, conclusions made on the basis of the results analysing the following

features of 244 touched and 210 untouched soil samples of original texture: moisture content, mechanical composition, micro-aggregate, differential porosity, and hydraulic conductivity.

Cs.F.-né

668. Szücs, M. - Palkovits, G.

Report on soil analyses made in the affected area of Szigetköz (Power-plant Bős-Nagymaros) in 1987. (Soil-Segments 45-61) (in Hungarian) Mosonmagyaróvár, pp. 1-78. Pannon University of Agricultural Sciences, Production Development Department Mosonmagyaróvár and VIZITERV. (Hydrological Planning Institution)
1988.

Description of 4 soil segments opened up in Szigetköz, and 13 soil segments below Győr; evaluation of results, conclusions made on the basis of the results analysing the following features of 312 touched and 255 untouched soil samples of original texture: moisture content, mechanical composition, micro-aggregate, differential porosity, and hydraulic conductivity.

Cs.F.-né

Water quality and public hygiene

669. Aponaszenko, A.D. - Filimanova, V. Sz.

Chlorofill content of Danube water, fluorescence and primary hydrooptical parameters of dissolved organic material. (Koncentracija klorofilla a, fljuoreszcencija.) (in Russian)
Gidrobiol. Zsurnal, 27, 5, 22-27.
1991.

Results of examinations, performed during the shipping on Danube in May 1988. Evaluation and practical value of data.
Effect of tributaris and hydraulic conditions on the water quality.

Cs.M.

670. Bacik, M. - Lehocky, J.

Examination of environmental effect of the Gabcikovo hydropower plant. (in Slovak)
Vodohosp. Spravod, 34, 11, 294-308.
1991.

Places and levels of the 7 fixed weiro damming in the old Danube-bed. Water output, necessary to keep the ground-water level and recharge it. Supplying water into the old Danube branches may be performed in the whole year.
Advantages of the mobile weirs. Operation in winter. Selfpurification. Water levels by different water outputs.

Cs.M.

671. Bacik, M. - Topolska, J. et al.

Probable morphological changes of Danube-bed after establishing the Gabcikovo' hydropower plant. (in German)
XVI. Konf. der Donauländer, 2, 599-606.
1992.

One dimension mathematical model was used to predict the morphological changes on the 31 km long Danube stretch.
The deposit was calculated by the Meyer-Peter formula, its coefficients were determined by measurements.

Cs.M.

672. Borsos, B.

Socio-political aspects of the Bős-Nagymaros barrage system.
Water Power, 43, 5, 57-59.
1991.

Unilateral delay of the construction of the barrage system from the Hungarian side. Supervision of the environmental effects. History of the project. Stressing the contrary opinions. Use of the Polano method.

Arguments to abandon the project totally.

Cs.M.

673. Bozzay, J.

Expertise on the fast deterioration of the Danube water (in Hungarian)
Budapest Municipial Waterworks, Archives, Manuscript.
1985.

B.Á.

674. Evaluation of the Danube' situation. (in Hungarian)

Vizeink, 30, 4-5, 9-12.
1992.

Interpretation and hydrological, technical, ecological, political evaluation of the Gabcikovo-Nagymaros barrage system, with special regards to the Slovakian particular solution, so called "C variant". Outline of a possible compromise.

Cs.M.

675. Elek, T.

Emergency plan of Danube. (in Slovak)
Vodohosp. Spravod 33, 11, 320-326.
1990.

Typical pollution on the Slovakian Hungarian stretch, accidental cases. Plans how to eliminate the effect of the accidental pollution must be elaborated both for the situation before and after the establishment of the barrage system. Proposed chapters of the plan, their consequence. Hungarian version of the Slovakian text would be necessary to make possible the recension and amplification.

Cs.M.

676. Fischherz, H. - Bolzer, W.

Problems with bank-filtered water in Austria.
In: Working group on bank filtration.
Budapest, February 20-24, 1984, pp. 1-20.
1984.

B.Á.

677. Hajós, B.

State of dead branches of Danube. (in Hungarian)
Víztükör, 31, 1, 8-9.
1991.

Cs.M.

678. Hayward, K.

Power struggle. Hydropower.
World Water, 16-18.
1992.

Situation of the discussion on the construction of the Gabcikovo-Nagymaros barrage system on the end of 1991. The power plant at Gabcikovo, the barrage at Dunakiliti and the supplying (and navigation) canal. The idea of the Slovakian barrage. Unsolved environmental problems. The study of the Nature Conservation Foundation.

Cs.M.

679. Ingerle, K.

Permeability and oxygen transport of river-beds close to hydroelectric plants of Danube. (in German)
Wasserwirtschaft, 81, 9, 415-418.
1991.

Structures of hydroelectric power plant change the natural conditions of the river-bed, so the oxygen demand increases, the organic content of the sediment and the bankfiltration process change unfavourably.

Cs.M.

680. Jakusin, V. M. - Bej, T. V. - Smargun, L.M.

Evaluation of the water quality of Danube, based on hygienic-bacteriological parameters. (in Russian)
Gidrobiol. Zsurnal 27, 2, 41-48.
1991.

Determination of water quality parameters during the expedition on the Danube (March 1988) between Vienna and the delta. Parameters examined: dissolved oxygen, BOD, total plate count, number of saprophyte bacteria, Escherichia coli, Enterococci, enterophages.

Cs.M.

681. Janauer, G. A.

Utilization of hydropower: thoughts how can be got over the technical - ecological conflict. (in German)
Öst. Wasserwirtsch. 43, 5-6., 126-129.
1991.

The ecological and technical-economical interests may be comparable during the establishment of hydropower plant, it real dialogue is formed between the partners.

So consensus may be formed on the reconstruction of old plants, on avoiding the great interventions on a river stretch, and also on the utilization of the hydropower of the earlier built up river stretches.

Cs.M.

682. Jecnik, G.

The Gabcikovo-Nagymaros barrage system forwarded to the federal (Czech and Slovakian) parliament. (in Slovak)
Vodohosp. Spravod., 33, 11, 315-318.
1990.

Some committees of the federal parliament gathered information in situ. Establishment of the barrage system, even declined from the original plans, may be considered as a European interest from many aspects. The possible international steps, connection to promote the matter.

Cs.M.

683. Korotkov, M. G. - Kljuev, N. A.

Polycyclic hydrocarbons in Danube' water. (in Russian)
Gidrobiol. Zsurnal, 28, 4, 88-92.
1992.

25 water samples were investigated by HPLC. 10 different PAH compounds were identified and quantified. By this method the hydrocarbon sources, polluting the Danube, may be laid down a map.

Cs.M.

684. Liska, M. B.

Problem of the Gabcikovo-Nagymaros barrage system. (in Hungarian)
Hidrológiai Közlöny, 71, 4, 198-201.
1991.

The technical point of view of the Czech and Slovakian party: "The opinion of the Hungarian, Czech and Slovakian technical experts on this topic is identical: the project is good, the environmental risks may be eliminated; it is necessary and desirable to finish the project according to the original plans."

Cs.M.

685. Lutz, W. - Soldner, T.

Control the Blochingen-stretch of Danube, with special aspect to preserving the natural state. (in German)
Wasserwirtschaft,81, 12, 567-571.
1991.

During the development (railway construction, increase of agricultural

area) on the end of the last century the double curve of the Danube was cut through. This caused deepening the river-bed and also ecological consequence. Now the original meandering river-bed will be restored.

Cs.M.

686. Márföldi, G. - Rétvári, L.

Geophysical proposals to the investigation of the environmental effects of the Gabcikovo-Nagymaros barrage system. (in Hungarian)
Földrajzi Értesítő, 40, 1-2, 25-38.
1991.

Application possibilities of the modern geophysic may be many-sided also on the effect area of the Gabcikovo-Nagymaros project. Grouping of the methods according to the target topic: waters of the river and flood area, underground water and river bottom, soils and aquifers to be studied.

Cs.M.

687. N. Szabó, I.

Ecological treaty on Danube. (in Hungarian)
Élet és Tudomány, 46, 14. 439.
1991.

Norms for the whole catchment aera of the river will concern to surface and underground waters, environment of waters, air, soil and protection of biotops. Government experts of the eight riparian countries agreed they start to prepare (by a centre in Budapest) the treaty.

Cs.M.

688. Oertel, N.

Heavy metal accumulation in Danube.
Ambio, 20, 6, 267-269.
1991.

Cladosphera glomerata as bioindicator of heavy metals. Floating artificial bearer was used to the analyse. The whole plant was used to study the accumulation.

Cs.M.

689. Petto, H. - Humpesch, V. H.

Water quality of Danube on the Altenwörth' barrage area. (in German)
Öst. Wasserwirtschaft, 43, 17-23. (Part 1.)
1991.

According to the data of macro-zoobenthos examinations from 1976-87 the Danube may be characterized by the second water quality closs. It is supported also by the data of chemical and microbiological parameters:

ammonium, oxygen demand, BOD, number of bacteria (on 22°C).

Cs.M.

690. Petto, H. - Humpesch, V. H.

Water quality of Danube on the Altenwörth' barrage area. (in German)
Öst. Wasserwirtschaft, 43, 17-23. (Part 2.)
1991.

The most important water quality parameters (ammonium, phosphate, oxygen demand, BOD) deteriorated between 1957-76, then slightly improved.

Cs.M.

691. Rákosi, J.

Who drinks the water of Danube. (in Hungarian)
Figyelő, 35, 40. sz. melléklet.
1991.

Contamination of the Danube' water.

Cs.M.

692. Savic, R. - Orlic, B.

Control of groundwater level on the dammed stretch of Danube. (in Serbian)
Vodoprivreda, 22, 5-6, 649-652.
1990.

On the Kovin-Dubovac stretch, dammed by the hydroelectric plant "Iron gate", the surplus water, due to elevated groundwater level, is removed by pumping. So is controlled the optimum level of groundwater, necessary to agricultural work and preserving the buildings.

Cs.M.

693. Sozinov, A. A. - Alekszeenko, V. O.

Complex evaluation and classification of the Danube water quality. (in Russian)
XVI.Konf. der Donauländer, 2, 639-644.
1992.

During the complex ecological expedition in autumn 1990, at medium water-level, samples were taken on 72 cross sections, and there were examined for 250 parameters.
Presentation of the procedure and the results of the complex evaluation.

Cs.M.

694. Szabó, I. M.

Probable effect of Nagymaros barrage on the microbiological-chemical dynamics of Danube and on the quality of the raw river water. (in Hungarian)
Hidrológiai Közlöny 71, 3, 133-141.
1991.

The aim of the article was to justify scientifically the cancellation of the Gabcikovo-Nagymaros construction works. Summary of the nationwide discussion. Probable physicochemical-biochemical dynamics of Danube water and bottom sediment on the upstream and downstream stretches. Problems of the drinking water supply. Contributions discussing the author's viewpoint.

Cs.M.

695. Szántó, J.

Restoring the Danube, close to the natural state at Blochingen. (in Hungarian)
Műszaki Inf. Környezetvédelem 9, 53-54.
1992.

Reporting in Hungarian the article of Lutz and Soldner, published in journal Wasserwirtschaft (German).

Cs.M.

696. Újfaludi, L. - Maginecz, J.

Groundwater under the Szigetköz area. Hydraulic and water quality analysis, 1987-1989. (in Hungarian)
Hidrológiai Közlöny 73, 279-297.
1993.

The transport of polluting materials was studied. The actual groundwater quality is determined predominantly by local source of pollution. The water quality parameters of the shallow wells reflect the varied chemical composition of the surface sources of pollution. The chemistry in the lower horizons of the deep well groups display local anomalies, for which ion exchange or upflow from Pannon artesian layers are offered as possible explanation. The nitrate profiles are highly variable. No depth limit was detected.

Cs.M.

697. Várday, N. - Tevanné, B. É.

State of water quality and effect estimation on the projected Gabcikovo-Nagymaros barrage system. (in Hungarian)
Hidrológiai Közlöny 71, 3, 153-173.
1991.

The advantages and disadvantages of the construction of the barrage system are shown based on ecological and water quality considerations, detailed evaluating the measured data. Their definite conclusion is: the construction of the system is desirable.

Cs.M.

698. V. Nagy, I.

What about the ecological foundation of the canalisation of rivers? (in Hungarian)
Hidrológiai Közlöny 71, 3, 147-152.
1991.

Instead of the abandon the Nagymaros barrage system the author proposes optimization of the operation of the system (giving also basic method to it), which can meet both the ecological and technical demands together.

Cs.M.

699. Wagner, E.

Hydropower caused environmental pollution. (in German)
Wasser Energie, Luft 83, 15-16.
1991.

Conclusion of a conference is: establishment of hydropower plant, performed by professional projecting and precise construction, hardly damages the environment, in fact, in many cases the earlier damages may be restored. Contrary to the coal heated power plants the hydroelectric plants do not pollute the air.

Cs.M.

Landscape management and regional development

700. Csemez, A. - Csima, P.

Countryside Planning of Danube National Park and its Surroundings. (in Hungarian)
Budapest, University of Horticultural and Foodsciences I. volume 1-174 p., II. volume 175-310 p., III. volume 312-501 p., supplements 503-608 p.
1993.

Regional connection. Population, natural endowments. Nature protection, biological and endangered animal species protection. Landscape assets. Architectural and cultural-historical values. Condition of environment elements, environment protection. Economic structure, education, services. Tourism. Infrastructure. Water management. Legal background control. Conflicts. Summary of survey.
The analysis includes 36 communities (settlements), its scope of time varies from theme to theme but is overall; wide review of the region with extensive data; the results are illustrated on many diagrams and tables.

R.J.

701. Csemez, A. - Rechnitzer, J.

Rehabilitating and Developing Conception for Szigetköz. (in Hungarian)
Budapest, University of Horticultural and Foodsciences, North Transdanubian Department Centre for Regional Studies of Hungarian Academy of Sciences, 264 p. 11 tables, 28 figures.
1993.

The carriers of reform: human capital, social environment. Exploration of the landscape-environmental crisis: social, political and ecological conditions; requirements for the protection of nature and environment; summary of social, political oecological, economic and community conflicts and crisis in the small areas. Landscape management proposals: rehabilitation; natural protection; landscape protection; environment-protection; preservation of regional development principles. Landscape management-institutes and means; social background; institution background; establishment of means. Principles of regulation. Guide to landscape management planning.
The paper is the first to attempt the conservation of the regions ecological condition by outlining a rehabilitation and development plan and also reviewing concrete proposals and solutions.

R.J.

702. Fekete, M.

Tourism in Szigetköz. (in Hungarian)
Manuscript, North Transdanubian Department Centre for Regional Studies of Hungarian Academy of Sciences, Győr, 1-39 p. supplements 13 p.
1993.

Tourist attractions in the Szigetköz region. The possible touristic functions of the region. Turnover and demand analysis; national, county and regional levels. Enterprises and attractions of tourism.

Certain prominent attractions and tourism capacities (accommodation, restaurants, places of special offers) shown and rated according to communities.

R.J.

703. Iván, L.

Occupational Relations in Szigetköz. (in Hungarian)
Manuscript, North Transdanubian Department Centre for Regional Studies of Hungarian Academy of Sciences Győr, 10 p. 3 tables, 14 figures.
1993.

Employment centers, definition of labour force districts and their connections within the region. Changing expansion of the labour force districts in the function of time (1960, 1970, 1980, 1990). Labour exchange centres; characteristics of the sectors; structural tension. Characteristics of commuters, type of commuting; employment centres; independent communities; commuter-villages; exposed, dormant settlements.
Analysis of the settlement network based on employment data, wide evaluation of individual settlements.

R.J.

704. Lados, M.

Characteristics of Demographical and Occupational Structure in Szigetköz. (in Hungarian)
In: Spatial Structures Studies in North Transdanubia (Editor; Rechnitzer, J. - Sas, B.) Centre for Regional Studies of Hungarian Academy of Sciences Pécs, 75-112 p. 6 tables, 6 figures.
1987.

Demographic relation; the population of the Szigetköz region 1870-1987, the region's demographic outline. The mobilization of the population and work-force. The regional formation process of Győr and Mosonmagyaróvár from 1960, transport, commuters. Possibility of local employment; industry, construction industry, agriculture, service thorough analysis of demographic structure of the region. A useful database.

R.J.

705. Páll, Gy.

Economic Potential in Szigetköz. (in Hungarian)
Manuscript. North Transdanubian Department Centre for Regional Studies of Hungarian Academy of Sciences, Győr, 36 p. 9 tables, 7 figures.
1993.

Main factors which influence the economy of the Szigetköz. The region's share of the country's economy. Types of economic organizations and composition of sectors. Foreign investments. The economic structure and the role and importance of industry in the region. Main development paths of industry.

Provides a wide database on the economic potential in the region, analyzing and valuing on a community level.

R.J.

706. Perjámosi, I.

Mean-system of Economic Innovation in Szigetköz. (in Hungarian)
Manuscript, North Transdanubian Department Centre for Regional Studies of Hungarian Academy of Sciences, Győr, 42 p.
1993.

The development of the region between 1971-1986. Means of development between 1986-1990. Characteristics of the new system of implements: co-ordination, representation of interests, interest federation, boom of Enterprises; direct monetary assistance and review of the various local government development schemes; analysis of community developing resources.
Detailed data on the economic situation of the local goverments and the various projects of development and their financial resources.

R.J.

707. Rechnitzer, J. - Szörényiné Kukorelli, I.

Social and Economic Condition of Szigetköz and Environment Conflicts. (in Hungarian)
Győr, North Transdanubian Department Centre for Regional Studies of Hungarian Academy of Sciences, 1-73 p. 3 supplements, 11 tables, 24 figures.
1993.

The social and economic fundamentals of the Szigetköz region: favorable geographic situation, closeness to economic-cultural macroregional centres, traditional influence, human resources, local society, natural and production means, industrial basis, service networks, tourism, infrastructure of the settlement network, small regions.
The characteristics of enterprise environment, the reactions of these to the ecological crisis, the requirements of development and estimation of the future.
Community networks and spatial connections: state of supply in the settlements, spatial paths, limitation of the gravitation zones.
Outline points to the estimation of damage in the Szigetköz: investment expenditure, local deficit, rehabilitation and development costs, social-economic losses. The means and institute systems of regional development.
Updated review of the connection between the stratum of enterpreneurs and the environmental crisis. The spatial connections show a distinct dependency of the region.

R.J.

708. Tenk, A. - Salamon, L. - Csatári, R.

Review of Agricultural Production in Szigetköz. (in Hungarian)
Manuscript, North Transdanubian Department Centre for Regional Studies of Hungarian Academy of Sciences, Győr, 49 p. 14 p. tables, 6 figures.
1993.

The agricultural situation of the region: cultivation of plants, livestock-raising. Reorganization process in 1992 and its outcome; cultivation branches, crops structure; privatization and compensation; means of equipment and economic results; changes in the region's agricultural production. Connections between rehabilitation and development: scope of central control; local-regional measures.
It gives an overall picture of the problems: agricultural must face in the region and analysis impact of the environmental crisis based on the economic units.

R.J.

709. Zala, Gy.

Environmental and Regional Conception of Upper Danube in Hungary 1. Szigetköz-Győr. (in Hungarian)
Budapest, VÁTI. 1-45 p.
1991.

Environmental condition. National park. Demographic situation. Unemployment. Industry. Tourism. Services, lifestyle. Transport. Telecommunication. Energy. Water-transport. Treatment of sewage. Settlement development. Regional development. Development of spatial structure. Community-planning tasks.
Describes the fundamentals of region is general on main lines but the community level data of society and economy is insignificant.

R.J.

AUTHOR INDEX

Upper Danube River Section
Gabcíkovo-Nagymaros Barrage System

Environmental Impact Area

Scale: M=1: 175.000

10 km

N

Map No. 1

AUSTRIA

SLOVÁKIA

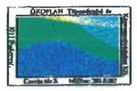
HUNGARY

BRATISLAVA
MOST
PETRŽALKA
PODUNAJSKÉ BISKUPICE
ramena Biskupického Dunaja
Rovinka
Miloslavov
ŠTVRTOK
DUNAJSKÁ LUŽNÁ
Alžbetin Dvor
Hviezdoslavov
Mierovo
Jarovce
Kalinkovo
Kvetoslavov
Vel.'Paka
LEHNICE
Rusovce
Hamuliakovo
HOR.POTÔŇ
Čunovo
ŠAMORÍN
Mliečno
Macov
Michal na Ostrove
Čunovo (Gabčíkovo) barrage
Trnávka
Báč
Rajka
Blatná
Dobrohošť
Rohovce
Holice
Dunajská Streda
Dunakiliti barrage
KRÁĽOVIČOVE-KRAČANI
KÚTNIKY
Dunakiliti
Vojka n. Dunajom
Lúč na Ostrove
Šul'any
Dol. Bar
Bezenye
HORNÝ BAR
Mad
Jurová
Padáň
Hroboňovo
Fekete-erdő
Dunasziget
VRAKÚŇ
Hegyeshalom
Trstená
Bodíky
BAKA
Abel 'ov
Gabčíkovo
Level
Halászi
Kisbodak
Püski
Mosonmagyaróvár
Dunaremete
Gabčíkovo barrage
Pastuchy
ČALOVO
Lipót
Darnózseli
Milinovice
Máriakálnok
Bokrosi-ér
Izop
Topol 'ovec
Bodza
Lipové
Hédervár
Novákpuszta
Ásványráró
ČILIŽSKÁ RADVAŇ
Vrbina
Holiare
ZEMIANSKA OLČA
Kimle
Palkovičovo
Medveďov
Tôň
Mecsér
Kľúčovec
Okoličná
Dunaszentpál
Dunaszeg
Trávnik
Nagybajcs
ČIČOV
Győrladamér
Vámosszabadi
VEĽKÉ KO
Lébénymiklós
Kližská Nemá
Győrzámoly
Kisbajcs
Vének
Kunsziget
Győrújfalu
Mosonszentmiklós
Ottevény
Gönyű
Győrszentiván

Legend

- Operation channel, reservoire
- Inundation dike
- Settlement
- Danube
- Forest
- Road
- Railway
- Border of admin. units
- Creek, channel
- River km
- State border
- Existing barrage

Prepared by:



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The digital map is based on the M=1:10.000 scale topographic map sheets of the Cartographic Company, Budapest, and on the aerial photography update of the Remote Sensing Institute, Budapest.

Data: Danube Environmental Monitoring and Information System

Upper Danube River Section
Gabcíkovo-Nagymaros Barrage System

Environmental Impact Area

Map No. 2

Scale: M=1: 175.000

10 km

Legend

- Settlement
- Danube
- Forest
- Road
- Railway
- Border of admin. units
- Creek, channel
- River km
- State border

Upper Danube River Section
Gabcíkovo-Nagymaros Barrage System

Environmental Impact Area

Scale: M=1: 175.000

10 km

Map No. 3