

cích vyvíjela jako monodisciplinární, je nyní transdisciplinárním oborem, vyžadujícím syntetickou znalost člověka a jeho kultury jako součásti ekosystému, a je založen na klasických oborech. Čtyři hlavní směry ekologie člověka naznačují její široký komplexní záběr:

- filosofické a další teoretické aspekty vztahů mezi člověkem a prostředím,
- biologické a sociální problémy,
- ekologické problémy adaptace,
- kulturní adaptace chování včetně výchovy a vzdělání ve vztahu k životnímu prostředí.

Ekologie člověka má specifické místo ve vědě a lidské společnosti. Vyplňuje mezeru mezi biologickými a sociálními vědními obory, mezi medicinou, pedagogikou a technickými směry.

Stejně jako vědečtí pracovníci ostatních oborů potřebují ke vzájemnému porozumění přesnou a společnou terminologii, je tomu tak i v případě ekologie člověka. Díky interdisciplinárnosti oboru vystupuje tento požadavek ještě více do popředí, vždyť ekologie člověka spojuje klasické vědecké disciplíny ve společném zájmu o studium životního prostředí, jeho změny a ve snaze zamezit nebo alespoň zmírnit negativní dopad těchto změn na lidskou populaci.

Knihy profesora Wolaňského je proto cenným příspěvkem a zároveň pracovní pomůckou pro všechny, kteří se podrobněji zabývají studiem ekologie člověka, neboť přináší přehled nejdůležitějších termínů používaných v oboru a jejich definice. Je napsána v angličtině. Autor sám v úvodu vtipně poznamenává, že „mezinárodním vědeckým jazykem je angličtina s cizím přízvukem“.

Příručka není řazena do tematických kapitol, ale využívá způsob slovníkového uspořádání hesel. Jednotlivé termíny jsou řazeny abecedně a u každého je připojena stručná a výstižná definice. Některé obtížnější pojmy jsou názorně doplněny grafy nebo schémata, které umožňují pochopit daný termín do hloubky a jsou vlastně současně drobnými ucelenými přednáškami k uváděné problematice. Zejména v těchto pasážích čerpal autor z bohatých zkušeností a mezinárodních vědeckých setkání.

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Knihy je velmi zdařilou publikací a dosud jedinou příručku tohoto druhu v oboru, jehož význam nepochybně vzrůstá. Její prostudování umožňuje i odborníkovi ze vzdálenější oblasti, aby si vytvořil jasnou představu o ekologii člověka a našel nové podněty k práci.

Ludmila Lhotská

M. J. Lisický: *Waterworks in natural environment*

Every waterwork in the landscape is an artefact but not without analogy. In small degree and temporarily they appear without the cooperation of man — by biological activity (blocking up the water-course by felled trees, beavers' dams etc.). It may be said that the first water plants created by man were imitations of natural reservoirs and canals. Today we build and use dams in other way, which certainly causes many environmental problems. The most important are the following: spatial homogenization of the water body (more often of water-course) — homogeneous, straight, hardly entrenched bed without coastal banks with littoral vegetation, is formed; time homogenization — exclusion of flood dynamics from inundations; destabilization of the bed — as a result of dropping of speed of flow of sedimentation of suspended load and stopping the movement of sediments; disturbance of the system of the river and its branches — by cutting branches off the main bed in the upper and lower end (because of the shipping in main bed) the species richness of fishes is reduced; the total liquidation of inundation by ponding; change of the quality of surface and under ground water — as a result of changed oxygen balance; problems with changes in water flow and quality — with incident waterlogging or inversely, decrease of the level of underground water and loss of water in the landscape; sanitary problems — danger of epidemics, penetrating of foreign elements — exotic aggressive species of plants, weeds and synanthropic animals. In certain cases comes to induced seismicity, endangering of archaeological or ethnographic values, social stresses of primary inhabitants as a result of rehousing. Apart from extinction of valuable, relic biotops large waterworks cause many physiologically uncontrolled problems.

P. Sýkora: *Water management buildings and the human environment*

Besides economically positive results anthropogenic influences on biophysical environment of man appear also in worsening of natural conditions and quality of landscape. From this viewpoint the author thinks about the gradual change of landscape in connection with dialectic knowledge of social conscious in the field of opinions on the quality of human environment. He recapitulates the post-war water management reconstruction in Slovakia with the comment that ecological criteria were not always respected the example of which is also the Complex of water plants Gabčíkovo-Nagyymaros. The author gives an analysis of the interactions of the water plant with the human environment of man and divides them into three spheres:

- material sphere (social-economical)
- sphere of nature protection (natural)
- sphere of super-structure (human).

The author states that large water buildings may be regarded as representative signs of the level of science and technics and at the same time of material and mental level of society creating them. On the one hand perfection of these artefacts is connected with fulfilment of social and economical demands and on the other hand in which way they are incorporated into ecological landscape system of which they are indivisible part. Fulfilment of these demands needs new approaches in solution and realization of water management buildings, especially interdisciplinary coordination already in elaboration of pre-project documentation.

The author analyses the causes of the present-day unilateral technocratic decision about dimensions and location of the water plant in the landscape the reason of which is absence of deeper interdisciplinary connections between technicians and ecologists, as well as in the lack of knowledge of counterpole professionalism. He calls attention to insufficient utilization of possibilities of bioengineering methods of building as realization of ecoengineering being illustrated in the solution of dams of protection line of dunning up in Nagyymaros in the Complex of water plants on the Danube.

I. Mucha: *The dam by Gabčíkovo and the quality of ground water*

A great part of ground water in the river Danube lowland area downwards from Bratislava is in oxidizing conditions and is of high quality usable for water supply without additional treatment.

The area has been influenced by human activities. Straightening and dredging the river bed, closing the Danube branch system, construction of dams upstream from Bratislava, etc. result in erosion and deepening of the river bed, substantial lowering of the ground water level, change of landscape and drying up of riverside forests and river branch system. Direct industrial and agricultural pollution of aquifer was observed. In this situation the hydraulic structure Gabčíkovo was situated. Its influence on ground water and the whole ecosystem, especially riverside vegetation, can be negative but also positive.

The hydraulic structure can be used, but also abused for the solution of problems existing in the Danube lowland. In any case, it is necessary to look mainly for an ecological optimum, especially where ground water is concerned. A symbiosis, or artificial ecological equilibrium acceptable for both nature and man can surely be found. If the hydraulic structure is not put into operation the major ecological problems of this area, especially preservation of ground water quality would still not be solved.

P. Peter: Danube constructions and their influence on natural environment under Bratislava

In the article are documented changes caused by Danubian constructions in human environment under Bratislava from the 18th century, when flows were realized by two branches of the Danube — with a basic share (30—40 %) of the river Malý Dunaj. Civilizational works (canalization) either for protection against floods and either the demands of shipping (preclusion of fords and meanders in the river bed) caused changes in bed inclination and at the same time in hydraulic gradients. The speed and the carrying power of water stream increased that led to its concentration on the main stream. In the 19th century continued the liquidation of rainforests by Malý Dunaj and their extent at the main stream was decreased significantly.

From ecological and technical viewpoint in the last decade the largest influence into the Danube basin was the construction of the complex of water plants on the Danube Gabčíkovo-Nagymaros, where the stress was paid on technical aspects — on hydroelectricity shipping and protection against floods. The present state needs the solution of the water plant especially from the aspects of ecology briefly mentioned in the article.

M. Ružička, L. Halada, P. Mederly, J. Topercer: The water reservoir Turčok from ecological viewpoint

The construction of water reservoirs presents essential interference into landscape. In the case of the water reservoir Turčok the insufficient evaluation of environmental features of the territory appeared especially significantly. The first step to the solution of the dispute — to build or not — was the evaluation of documentation, opinions and comments from ecological viewpoint. It is stated that the construction of the water reservoir was caused by the nonconventional development of the area Žiar nad Hronom and Prievidza. A part of documentation points at the negative impact of the water reservoir on the ecosystem of the river Turiec and ecosystems influenced by it, but there are not defined conditions necessary for their protection. Several problems of water management have not been solved (pollution, sampling, water regime), the dynamics of hydrological conditions are mapped insufficiently, especially its seasonal changes, quality and quantity of water. Besides single planned sampling will be necessary to solve several problems — e. g. reevaluate the problem of economical effectiveness of the water reservoir Turčok mainly from the viewpoint of soil utilization, loss of average production of biomass, loss of nonproductive function of forests etc. It is necessary to take into consideration also other factors, e. g. the always worsening immi-

ssion situation by the water reservoir Turčok and river basin of Turiec. Before the final decision of the construction of the water reservoir Turčok will be necessary to find answers for this complex of problems. While the present conception of construction of new sources of drinking water sets out first of all from technical solution and became conspicuous the question — how ensure water supply, at present and especially in the future will be necessary to find ways of rationalization of its consumption (by reducing of loss in distribution system of inferior quality, by economy measures in households and also in plants, by differentiated distributions of drinking and technical water etc.).

H. Kříž: The influence of the water-course Danube-Ostrava on human environment

The water-course Danube-Ostrava 253 km long ought to come into existence by regulation of the river bed of the Morava and the Bečva and also of older artificial canals, by excavating of new navigation canals and by building up of further water undertakings (barrages, lock chambers, ports). It is a large technical work meaning an important influence into human environment in floodplains and in Podbeskydská pahorkatina Hills. The building up of this large waterwork will influence not only the water stream, but the surroundings, too.

Permanent increase of water level in the beds of navigable rivers, canals of shipping and ports, may result in decrease of the levels of shallow groundwater in surroundings, unless we succeed in controlling it by construction of expensive undertakings with complicate operation (drainage channel, pumping stations etc.). The consequences of the phenomenon ought to be the increased influent seepage of polluted surface water into permeable sediments, waterlogging of agricultural areas, resp. also underwashing of buildings.

In the reaches where will be necessary to excavate the river beds, gets to the decrease of the level of surface water and of shallow groundwater in adjacent floodplains. These changes bring worsening of river regime, decreasing supply of soil water by filtration from the level of shallow groundwater and decrease of yields of groundwater resources (wells) in the influenced area.

Main positive changes in human environment ought to appear indirectly when a part of transport of goods by trains and lorries would be transported by ships. Shipping has less negative influences on human environment in comparison with other moods of transport.

J. Hajdúk: The process of planting of banks and uncovered soils along water plants and water-courses

In the ecosystems of large rivers certain per cent of soil cover is without vegetation as the consequence of changes of water levels where ecession and succes-

sion appears. The percent of ecession increases on river-courses at construction of water reservoirs, canals, dams, earth shifting and regulation of bed sides. In the area of water plants appears ecession by sowing of species: *Arrhenatherum elatius*, *Festuca pratensis*, *F. rubra*, *Lolium perenne*, *Dactylis glomerata*, *Medicago sativa*, *Agrostis* sp. div. and other species. Although from the last centuries are known localities with planting of trees and shrubs on banks, technical projects avoid planting for example in the area of water plant Gabčíkovo-Nagymaros. Ecession and succession are distributed by surf and abrasion on literally large water reservoirs. Abrasion is slowed up by e. g. *Carex hirta*, *C. buekii*, *Lysimachia vulgaris*, *Agrostis stolonifera*, *Phragmites australis* and other species. In litoral zone the species composition of plants in ecession and succession depends on the content of organic matter in soil. The quickness of ecession on the banks of drainage channel and derivative channel of the water plant Gabčíkovo-Nagymaros is markedly high. According to ecotops after some days we can see grow and germinate 50—100 % synanthropic species and only little meadow and forest species. Ecession on the banks of the reservoir of Pumped-storage hydroelectric power plant on the Čierny Váh is slower, uncovered localities on certain stands stayed several months and also here in 1000 m above sea level weeds formed 35 % of species, meadows and forest species 44 % and tree species 15 %. The cover of synanthropic species reached in each stand more than 50 %. It seems to be that in the long past the primary stand of certain species of weeds may be the uncovered places along water-courses and reservoirs.

E. Kalivodová, Z. Feriancová-Masárová: The importance of retentional reservoirs for ornithofauna

Between the years 1986—1990 were examined the ornithofauna of twenty retentional water reservoirs — ten in the Trnavská pahorkatina and ten in the Malé Karpaty Mountains. The authors established there the occurrence of 67 species of water birds, out of this 31 (46.1 %) nested in the examined localities, 8 fled in (for feeding, sheltering, resting etc.), 20 species they recorded during spring and autumn migration. and 8 in winter season. The water reservoirs in the Trnavská pahorkatina (plateau) were richer from ornithological viewpoint (58 species against 43 species in the Malé Karpaty Mountains). This fact was connected with the presence of rushes and with the character of adjoining biotops (smaller water areas, resp. fishponds in the neighbourhood of localities on Trnava plateau) and with the character of the relief of the Malé Karpaty Mountains. The quantity of species in single reservoirs significantly differs,

from 4 to 46 species in the richest locality (Budmerice).

Retentional water reservoirs were constructed on purpose to water catchment for irrigation. At the same time some of them are utilized for recreation (Vrbové, Buková, Rohožník) and in each live fishes. While they are not dry and frozen in winter, birds stay there all the year round. The most frequent species of reservoirs were mallards (*Anas platyrhynchos*). Their number was influenced by anthropogenous influences, concretely by let out of specimen from artificial brooders for the needs of associations of hunters. Considering that water biotopes in Slovakia decrease, all examined retentional reservoirs are important for free-living birds and their protection without respect to their character and extent. By ageing of localities, extension of rushes and developing of bank vegetation some of them obtain gradually the character of biocentres which are by their composition near to original biotops.

Risks of large dams

Also several experts from abroad gave their opinion on the occasion of the international conference „Ecological risks and economical results of the water plant Gabčíkovo“ held in Bratislava in November 1990. The discussion brings the opinions of dr. Philip B. Williams from USA, the president of International Rivers Network of the problems of large dams. They are comparable with atomic power stations from several aspects. The costs are high and their existence is connected with many risks as limited experiences, application of insufficiently verified technologies, possibility of failure of technics and human factors. There is always a large influence on natural and human environment. The countries of the

third world are in the largest danger, because there are the most marked efforts to overcome the nature and to obtain quick profit. The benefit for these countries is often imaginary, because damages in human environment, negative impacts on life, inhabitants, agriculture, fishery overtake the benefit of obtained energy, precipitation or of „new possibilities“ of the development of fishery. The real profit of building of large dams has the town elite, projectors and building companies. From ecological and economical point of view country inhabitants suffer from negative influences. The questions of the safety of dams are often analysed insufficiently and one-sidedly. Examples of dam catastrophes when technics, technology or human factor failed, are shocking.

The world ought to notify that the richness of the Earth is not unexploitable and is necessary to change insight and philosophy of utilization of always more important water resources from the viewpoint of a well-balanced water regime, healthy and complete ecosystem in the neighbourhood of water-courses, protection of healthy drinking water for future generations.

P. Sýkora: Natural banks of small water reservoirs

Small water reservoirs constructed on small rivers, as well as fishponds and recreational reservoirs become at suitable incorporation to the landscape its almost integral part. The article examined especially the utilization of polyfunctional features of tree species vegetation on the slopes of the banks of reservoirs and rivers. The author calls attention to possibilities of ecologically optimum interaction of biotic and abiotic elements on the banks and their integrity with the surrounding. He comes to an innovate proto-

typ of a natural dam, i. e. to protect side slopes of dams by specific regime of water level in the reservoir by the roots of tree species vegetation.

P. Barták, I. Matečný: The utilization of remote sensing of the Earth in biological monitoring

The aim of application of the methods of remote sensing of the Earth within the frame of biological monitoring is the exact putting down of the present stage and the following of the development of ecosystems before and after putting in working of the water plant Gabčíkovo. The materials of remote sensing of the Earth obtained in different levels and different methods give a global picture of the landscape. There are emphasized convenient thematical elements on interpolation of surface measurements, resp. observation, on registration of phenomena imperceptible by surface methods and on better putting down of their horizontal correlations and interactions in continual form.

V. Vlček: Causa Nové Mlýny

At present when the construction of reservoirs Nové Mlýny on the confluence of Moravian rivers Dyje, Svratky, Jihlava and Morava is finished were renewed old disagreements and is pointed at negative influences especially in the protected area Palava. The decision of the further course is under the control of the Ministry of human environment of CR.

M. Ružička: Ecological risks and economical consequences of the water plant Gabčíkovo

The aim of the international conference on this problem was to point at ecological risks and their economical consequences by cooperation of experts from abroad, i. e. to confront advantages of the water plant with disadvantages.

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