B. Gašparíková: To the law about wastes

On the 22nd May 1991 the National Assembly passed the first law in the field of human environment — the constitutional law about wastes filling up the gap in Czechoslovak law and with its content it is comparable with similar legal adjustments of well developed countries. The law is not comprehensive, it has only 17 paragraphs but it brings a complex starting adjustment is the field of wastes. It establishes the rights and duties of juristic and physical persons of manipulation with wastes. In the first part the law defines the terms (waste, specific waste, dangerous waste, secondary raw material, manipulation with waste, waste management, neutralization of wastes etc.). The law establishes the basic principles for the relations modified by it, it modifies also the conditions of import, export and transit of wastes in the territory of CSFR. The third part contains the starting modification of the dues and penalties for breach of duties following from this law. The accepted law is the starting point for republican laws about state administration in waste management and for regulations modificating every detail regarding wastes.

E. Parráková: From waste disposal to waste management

The production and use of goods are unavoidably in connection with waste production. Waste management appears today as an antagonism between the process of production and utilization. We have to find adequate technologies for waste disposal. One of the very striking problems of protection of human environment is the question of environmentally convenient waste disposal. Thermic waste treatment lies on the border between the stoppage of production and utilization and the demands for convenient scraping of wastes in the future. The reduction of thermic waste treatment comes into consideration when preconditions of our life change so much that the requirements for optimum waste disposal influenced also the production and consumption behaviour of inhabitants. The transition from waste disposal to waste management will take priority. In spite of this we cannot avoid to waste landfilling although on rigorous conditions, and they will have to be conveniently adapted.

E. Galovič: The problems of waste management in Slovakia

In Slovakia according to the statistic investigation from the year 1987 cca 38 million t of solid wastes are produced in a year. Waste is produced and is necessary to neutralize it, partial utilization is unsufficient. It is necessary to aim at maximum stoppage of waste production, and/or their treatment by wasteless recycling technologies. The situation in waste management has to be solved also legislatively. From the lst September 1991 the Law of wastes comes into force and in connection with it regulations and further republican legal adjustments, directives and rules are prepared. Besides legislative adjustments also economical factors will be important — either as a motivation of business activities, or as a stimulation of their minimization and perfect scraping. In connection with wastes must be solved many problems. Many of them are being solved (liquidation of dangerous industrial wastes, experimentally separate collection of solid household wastes etc.), the others are being prepared. In solution of these problems we cooperate with excellent partners from abroad and after the passage of legislative adjustment and with the development of privatization we expect also their interest in direct investment to waste management in Slovakia.

P. Ivančíková, J. Demek: The problems with solid wastes in the district Olomouc

The district Olomouc is situated in central Moravia, its area is 1 452 km² and its centre is the town Olomouc with hundred thousand inhabitants. In this area during the investigation of dumping sites of solid wastes made in the years 1988—1991 were established more than 300 dumps, out of this 60 ones were recultivated. In the year 1987 in the district was produced 1 754 000 t of solid waste, out of this 640 t was dangerous. Only the half of this dangerous waste was neutralized. The largest problems appear at the dumps located in the flood plain of the Morava river and on low terraces. From the viewpoint of human environment the dumping sites on devoni an limestones are also dangerous. Within the frame of investigation was probably miscarried to determine all dumps, especially the "black" ones in afforested hilly areas. On the map (Fig. 1) 1 : 50 000 are expressed also the interactions of dumps and natural concentration of underground waters, zones of sanitary protection of water resources and protected areas.

J. Tölgyessy, M. Harangozó: Perspectives of liquidation of chemical and other dangerous wastes in the SR

Dangerous industrial waste presents cca 10 % of the total amount of wastes. From the viewpoint of liquidation we divide these wastes into 3 types: wastes containing dangerous materials and compounds not changing their base by thermic treatment (inorganic materials), organic dangerous wastes neutralizable by thermic way, emulsions and suspensions, waterless (or with little water content) organic dangerous wastes neutralizable by thermic way. The oldest method of liquidation of the majority of toxic wastes is scraping, but it has to fulfil rigorous requirements for protection of the environment. The most radical, sanitary, the most effective and almost universal mood is their incineration. Incineration plants must be equipped by very effective cleaning plant. Liquidation of dangerous wastes ought to be realized in centres ensuring also their collection and transport. From the balance of dangerous wastes in the SR follows the need to build up 4 incineration plants with the capacity of 3 500 $t \cdot r^{-1}$ and unavoidably also dumps of incombustible dangerous wastes, because today exists only one incineration plant with ecologically suitable parametres.

O. Adamec, M. Černý: Ecologically compatible and energetically advantageous mode of processing of livestock excrements

An important moment coming to the limelight of research and practice in connection with ecological and energy problems is the question of suitable processing of the huge amount of liquid manure produced in the form of slurry in large farms. Taking in account the criteria of ecological compatibility and energy saving, the method of anaerobic fermentation (methanogenesis) is to be favored. Using this method the resulting products are biogas (mixture of methane and carbon dioxide) and the fermentation rest (digested sludge). The complex of advantages of this process is demonstrated on a concrete example of a project concerning a high capacity swine farm going from the phase of planning to realization just in these days.

E. Kachaňáková: Minimization of waste production by ecologically convenient technologies

One of the way how to minimize waste production is the use of ecologically

convenient technologies. In the past in order to preserve natural environment this trend was in our country underestimated and therefore became its quick devastation. In ecologically convenient technologies the emphasis is put not only on wastelessness and rationalization of the whole technological process, but the ecological aspects of raw materials and products are considered also complexly. Technical and technological state of our industry is very far from these principles. This state cannot be changed from day to day. Examples of concrete processes of ecologization of technological processes are to contribute to coordination of unavoidable industrial activity with the needs of the whole society in the cause of protection of health and human environment.

J. Drdoš: Advances in landscape synthesis research

The aim of the international symposium was to evaluate the development of landscape synthesis in international geography during the last years and at the same time to judge the suitability of different approaches of geographical landscape research in the solution of the project: "Spatial structure of environment and the quality of life" (Upper Nitra) that was the object of the agreement of international cooperation.

M. Procházka: A complex plant for waste treatment in Bratislava

The building up of a new incineration plant helps to solve the present negative state in liquidation of solid household waste in Bratislava. The realization, financing and processing of the project is ensured by a mixed company formed by French firms — Compagnie generale de chauffe, Inter G and the town Bratislava.

Š. Szabó: Application of geostatistics in modelling of solid waste distribution in Košice

In contradiction to classical interpolation methods geostatistical solution takes into consideration the degree of correlation between the values of samples in certain area, as functions of distance and direction between samples. For the modelling of solid wastes in Košice were used the data from 35 stations from different parts of the town. The resulting model is the map of isolines where we can establish 2 main types of pollution sources, as well as to follow the direction and extent of pollution in the town. The complementary result is the map of isolines of deviation of estimate expressing the distribution of reliability of estimated values that may be used as a base for optimization of the network of the sites of sample collection. Geostatistics may be used in solution of the most particular environmental problems, e. g. distribution of the elements of heavy metal in soil or extension of radioactive fall in space etc.

A. Daňo: Radioactive waste — where with it?

In atomic power station are produced fluent, liquid and solid radioactive wastes. A special cathegory of these wastes is construction material — technological and also building one — from liquidated atomic power station. An important problem is burnt-up fuels. The situation of liquidation of little and middle active wastes is not good. This unsolved problem has its own legislative form. The development of nuclear energy in our country cannot be taken into account without answering important questions of treatment and scraping of every type of wastes and without solving the economical and ecological problems.

V. Jakubov: A computer programme in solution of the problems of wastes

There is an example of the use of the computer programme LOTUS for modelling of the waste situation on a concrete area.

T. Hrnčiarová, Z. Izakovičová: Architecture in the environment

The motto of the scientific conference held at the end of May this year in the High Tatras Mts. was: architecture — human environment — harmony — health. The main theme of this conference was the environment where the architectonical work takes place, influences and forms it, the environment the architecture forms for human beings. Three aspects were emphasized: architectonic--urbanistical, sociological and ecological one.

K. Nováková: IDRISI — a programme for GIS — a special course for the work with the landscape

The aim of the course led by the lectors of UNITAR in the last week of May in Banská Štiavnica was to train the Slovak experts for the work with geographical information system in software IDRISI.

J. Šteffek: European seminar on practical landscape ecology

The European seminar was organized in the beginning of May this year by IALE in the Danish University Centre Roskilde. In the course of 3 days 60 reports were delivered in the following themes: Practical landscape ecology in Europe, European projects in landscape ecology, Landscape ecology in planning, Landscape ecology — theory and methods.

R. Hradský: Relation-systems methods — a methodological starting point of solution of the problems of human environment as of a global system

The aim of methodology is to observe the facts characterizing relational and systems method of any human activity. The success of this activity depends on many factors the methodology do not examine, but in spite of this it has something to say. Today, in market economy the importance of relation-systems approach is evident also in investigation of human environment as of a complicated system. Its components have a large amount of interrelations, material, energetical, informational ones. In human environment comprehended as a system important relation is valid either within the frame of this system or its relation with the surroundings. These facts are

the basis of systems comprehension of the problems of human environment as a global system. The importance of systems analysis is evident not only from the viewpoint of longterm prognoses also in the field of management of human environment.

M. Rajčok, B. Böhmer, M. Kalousek: **Liquidation of household and industrial wastes of Bratislava**

The collection and liquidation of refuse and industrial waste in town agglomerations has been one of the most important tasks solved by Town Offices. They are solved at the section of sanitary technique. The quantity and composition of waste has been influenced by number of inhabitans, layout of population, standard of living, extend and structure of the industry and agriculture. Optimum solution depends on hinterland of the agglomeration.

The most convenient sequence is: organized dump, fermenting, combustion.

According to the conditions it is necessary to choose optimum method of liquidation of the waste, especially regarding to life surroundings of population.

T. Mažárová: **The present state and perspectives of liquidation of solid household waste in Bratislava**

The capital of Slovakia as a strongly urbanized territory with almost a half million inhabitants and with its structure of industry, produces a wide sortiment of wastes, out of this solid household waste presents cca 270 kg/inhabitant and per year. An increase of its production is expected. The present situation of this waste disposal is critical. The state of technical equipments of incineration plants is accidental and it results increasing emissions of harmful materials. Accidental deposit of clinker and fly ash does not exist. The town accepted the decision to solve this situation in 2 stages. In the first stage a new incineration plant will be built (to the lst January 1994) and in the second stage will be built up the system of waste classification and producing capacity in connection with gradual solution of the problems in separate waste collection. It is in a harmony with the most progressive trends in the world (separation in waste producers) and with utilization (in processing works). In this field we have only little experience. Experiment with sorting of household wastes in Prague assumed that the topic of the problem is in absention of processing industry of selected fractions.

N. Ďurajková: **Air protection**

Besides inorganical and organic processes the anthropogenic activity always more intensively influences air composition. It "makes richer" the atmosphere by the compounds of sulphur, nitrogen, heavy metals, different organic materials and ozone. From the eighties within the frame of the Hydrometeorological Institute exists a system of evidence of sources of air pollution REZZO (Register of emissions and sources of air pollution). In Slovakia the outline of air quality sets out from the analysis of these measurements and takes into consideration geographical conditions of single localities. The largest problems appear in the central part of Slovakia, in industrially utilized hollows. In lowlands the situation is a little better, because there exists the possibility of dispersion of harmful materials. Mountains are also damaged, and/or threaten by air pollution. Different stage of air pollution is recorded on the whole territory of Slovakia, because there are no areas without fall of light ash.

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Monotematickú časť čísla zostavil **RNDr. Milan Ružička, CSc.**