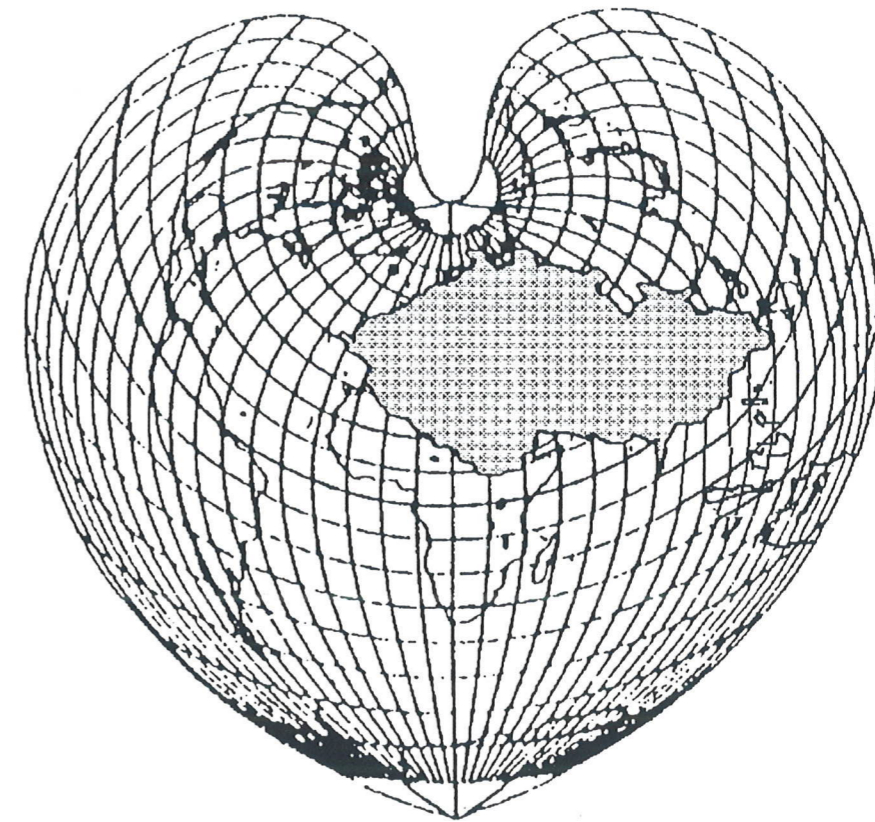


Pavel Novacek, Peter Mederly et al.

STRATEGY OF SUSTAINABLE DEVELOPMENT FOR THE CZECH REPUBLIC

Case Study of the Country in Transition



Palacky University Olomouc
Society for Sustainable Living Prague, Bratislava

in collaboration with
Millennium Institute, Arlington

Contents

Authors:

RNDr. Pavel Novacek, Csc., RNDr. Peter Mederly

Co-Authors:

RNDr. Hynek Adamek, Ing. Michael Bartos, CSc., Ing. Petr Boukal, Doc. MUDr. Zuzana Brazdova, CSc., RNDr. Dusan Drbohlav, CSc., RNDr. Dagmar Dzurova, CSc., Ing. Vladimir Faifr, Csc., Doc. Ing. Fedor Gal, DrSc., PhDr. Zdenek Hanzl, CSc., RNDr. Lubos Halada, RNDr. Jaroslav Horak, PhDr. Vaclav Hrnicko, Doc. PhDr. Stanislav Hubik, CSc., Ing. Vladimir Kartusek, Mgr. Alan Kaspar, JUDr. Eva Kruzikova, CSc., RNDr. Pavel Krivka, CSc., Mgr. Petr Macha, Doc. JUDr. Vaclav Mezricky, CSc., PhDr. Dana Motyckova, RNDr. Jiri Plaminek, CSc., RNDr. Jitka Rychtarikova, CSc., Prof. RNDr. Otakar Sterba, CSc., Ing. Jan Tesitel, CSc., RNDr. Josef Tillich, CSc., Ing. Jan Topercer, PhDr. Frantisek Znebejanek, CSc.

Consultants:

Dr. Gerald O. Barney, Ph.D., Millenium Institute, U.S.A.

Dr. Martha J. Garrett, Ph.D., Millenium Institute,
European Representative, Sweden

RNDr. Mikulas Huba, CSc., Society for Sustainable Living, Bratislava

Doc. Ing. Josef Vavrousek, CSc., Society for Sustainable Living, Prague

Translation:

Jana and Michael Stoddart

Technical Assistance:

Hana Bastrova, Irena Kucerova, Mgr. Pavlina Samsonova, Tatiana Vlckova

1.	Introduction	1
2.	Methodology	2
3.	Historical Development on the Territory of the Czech Republic	4
4.	International Relationships	6
5.	The State of the Environment	9
6.	What Does it Mean "Sustainable Development"?	12
7.	Population	15
8.	Nutrition	18
9.	The Health of the Inhabitants	28
10.	Urbanisation and Settlement	34
11.	The Migration of Inhabitants	35
12.	National and Ethnic Problems	38
13.	Agriculture	39
14.	Forestry	43
15.	Water Management	46
16.	The Extraction of Mineral Resources	54
17.	The Energy Industry	56
18.	Industry	65
19.	Transport	69
20.	Telecommunications	74
21.	Tourism and Recreation	77
22.	Economic System	81
23.	Economically Orientated Alternative Scenarios	84
24.	A Long-Term Model of the Czech Economy	91
25.	Political System	97
26.	Legal System	103
27.	The Security of the State and Its Inhabitants	111
28.	Education and Upbringing	123
29.	Value Orientation	129
30.	Integration of Sectors	134
Part II. Towards Sustainable Development		
31.	The Development of Man	139
32.	Natural Factors Influencing the Biosphere	141
33.	The Biosphere and the Environment of Man	143
34.	The Third Global Revolution	144
35.	What Should We Do?	151
36.	Key Sectors	174
37.	Landscape-Ecological Evaluation of the Czech Republic	189
38.	Landscape as a Resource, Landscape as a Home	198
39.	The Implementation of Sustainable Development	202
40.	Conclusion	205
41.	Bibliography	209

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Introduction

In 1989 people in former Czechoslovakia overthrew the forty-year hegemony of one political party and since then our society has started to change. The once tempting vision of the construction of a communist society died and we found ourselves at "the beginnings of capitalism" with all the consequent positive and negative phenomena. Freedom, democracy, restitutions, privatisation, wealth, unemployment, profit and crime - all these threaten the citizen who was educated, not as an individual and personality, but as an unimportant part of the state, bureaucratic and political-party system. We were taught to be average, to support the collective and a mass life style.

For six years we have been discovering that we inherited from communism an economy in virtual collapse everywhere in the country, not just in certain areas and that the health of our citizens is one of the worst in Europe.

We think that before and during "the Velvet Revolution" there were at least six groups of citizens who greatly influenced the change in the system: students, signatories of Charter 77, Christians, artists, protectors of nature and scientists (particularly ecologists, economists, sociologists and futurologists). Protectors of nature and ecologists had a great opportunity to vitally influence the development of society, but they missed this opportunity. The main reason why the opportunity was lost was the *absence of a positive alternative program*.

We are entering a future which is unknown. It is not possible to predict a particular future with the help of scientific methods. However, it is possible to look for borders, limits within which society will develop in the coming decades. There are both development opportunities and development risks or dangers. It is possible to try to make a "map of the future", to analyse conditions under which particular positive or negative phenomena will appear. It is possible to try and identify the conditions and key factors which will help to establish desirable future by which we, as environmentalists, understand the sustainable style of living which "seeks for balance between the freedom and rights of each individual and his/her responsibility towards other people and nature as whole, including responsibility towards future generation" (Josef Vavrousek).

We believe that we need alternative, positive visions of the future that could be "moulded" into a strategy of sustainable development. The study we are presenting is an attempt to contribute to the creation of such a strategy. In this way we want to participate in the creation of our future.

In the same way as the first report to the Club of Rome more than 20 years ago, "The Limits to Growth", was criticised from many sides but, because it provoked and inspired, it fulfilled its purpose, so we too will be satisfied if the results of our efforts are evaluated in different ways and thus fulfil the function of a kind of catalyst.

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Methodology

For the elaboration of a strategy of sustainable development we have been inspired by the methodology of the so-called "National 21st Century Studies" (Garrett, M., J., 1990).

According to the definition of Gerald O. Barney, President of the Millennium Institute (until 1993 Institute for 21st Century Studies) the National 21st Century Study is "a multisectoral, integrated work that has a long-term perspective and seeks strategies that function satisfactorily now without leading to negative consequences later".

If the 21st Century Study is to be trustworthy, it should fulfill the following criteria:

1. Preference is given to the elaboration of the study by domestic experts before foreign ones, the study should have wide support among government and non-government organisations. Also many people from various fields of human activity should take part.
2. The study should cover all fields of human activity, all of which we suppose will play an important role in the future. Special attention is paid to mutual relationships between these fields.

Among the fields investigated there are usually the following ones:

- agriculture, food, nutrition;
- biodiversity, nature conservation;
- culture, social environment;
- demography, population;
- economy, financial sector;
- education;
- energy industry;
- environment;
- exploitation of the Earth, natural areas and regions;
- extraction;
- fishing, coastal resources;
- government, political system, legal system;
- health of the inhabitants;
- housing;
- human values and aesthetics;
- industry;
- infrastructure;
- international relationships, external factors;
- science and technology, biotechnology;
- social services, social insurance;
- social structure, distribution of wealth;
- telecommunications;
- tourism, recreation;
- transport;
- urbanisation, settlements;
- water resources.

3. The study concentrates on a long-term perspective (at least two or three decades) rather than short-term problems.

4. The study investigates the mutual relationships and connections between a nation and the rest of the world, above all in the fields of economy, environment and security.

I always went purposefully where it is possible to deal with problems of the environment and humankind in an integrated way, especially in social sphere. This is not just question of natural sciences which give us basic information how nature "works", or question of technology, which looks for technological solutions. Key to solution of environmental and global problems of humankind lies in social sciences, starting with philosophy, psychology and sociology. Synthesis of social, technological and natural sciences is simply unavoidable because it brings people to complex, systematic thinking.

Jozef Vavrousek,
former Minister of the Environment and Founder
of the Society for Sustainable Living in Czechoslovakia
who tragically died in 1995 in avalanche in Tatra Mountains (Slovakia)



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5. The study investigates national strategies that are environmentally, socially and economically sustainable.
6. The study deals also with moral, philosophical and political problems and it evaluates the existence and functioning of national institutes which should deal with these questions.
7. The study should promote a public discussion, followed by political measures and practical action.

Such kind of study helps to investigate alternative national futures and to define strategies for reaching desirable aims. So far around the world over fifty national or regional 21st Century Studies have been completed.

Five years ago the representatives of the Millennium Institute offered the Palacky University, Olomouc the chance to prepare and coordinate this study for then Czechoslovakia. The Millennium Institute provided the research team (among whose members there were 29 representatives of 16 universities, research institutions and private companies from the Czech Republic and the Slovak Republic) with expert consultations and methodological toolkit.

The aim of the project was the elaboration of a strategy for the sustainable development of society. We feel that as ecologists and environmentalists are able to analyse the present unfavourable situation and the state of the environment well, but we have problems creating comprehensive constructive proposals.

The structure of the project is adapted to this aim. Baseline sectoral analyses are the first step. In a total of 21 sectors we have described the present state, factors which are of key importance for development and we have briefly characterised the prospects for the development of these sectors.

The list of analysed sectors:

- international relationships;
- environment, landscape;
- population;
- nutrition and the health of inhabitants;
- national and ethnic problems;
- urbanisation, settlement;
- agriculture;
- forestry;
- water management;
- extraction of raw materials;
- energy industry;
- industry;
- transport;
- telecommunications;
- tourism and recreation;
- economic system;
- political system;
- legal system;
- security of the state and its inhabitants;
- education and upbringing;
- human values.

ECOLOGISTS AND ENVIRONMENTALISTS ARE ABLE TO ANALYSE THE PRESENT UNFAVOURABLE SITUATION AND THE STATE OF THE ENVIRONMENT WELL, BUT WE HAVE PROBLEMS CREATING COMPREHENSIVE CONSTRUCTIVE PROPOSALS.

The analysis of certain sectors has been subdivided under separate headings within a single chapter.

The integration of sectors was the second step. We tried to identify mutual relationships and connections between sectors.

The next step was the creation of concise, economically-orientated alternative scenarios of the development of society and the more thorough elaboration of a "desirable" scenario, the scenario of sustainable development. This study is orientated above all towards the scenario of sustainable development.

The last step is implementation of results. The results are now available to government and non-government organisations in the Czech Republic.

Historical Development on the Territory of the Czech Republik

To understand the basis of our own character we should try to understand the main events in our history, those which greatly effected our mentality and culture.

The Slavs first came to the territory of present Czech Republic (probably from the Russian steppe) between the 5th and mid 6th centuries. Around 830 AD, the Great Moravian Empire was founded. The Moravian tribes were already unified, the Bohemian tribes were unified only during the existence of the Czech State. In 863, Constantine and Methodius brought a Christian Liturgy in a Slavonic language and the Scriptures.

Around 900 AD, the Empire started to split up, mainly because of the effect of the Hungarians. The Hungarians entered the Danube basin and the Slavs living over there faced their influence. In the West the Slavs faced the influence of the Frankish Empire. Gradually, two nations developed this way, the Czechs in the West, the Slovaks in the East. For many centuries they lived separated. The Czech State was founded at the end of the 9th and beginning of the 10th centuries. This state had to fight the Frankish Empire permanently.

In the 14th century, Charles IV helped enormously to increase the level of education in Bohemia and he introduced Czech language (instead of Latin).

Jan Hus in Bohemia started with the first attempts at church reformation at the end of the 14th and beginning of the 15th centuries.

In 1458 Jiri of Podebrady became Czech king. He was the only Czech king, apart from house of Premysl's, the first kings.

In 1526 the House of Habsburgs came - they were of Austrian-German origin. They were Catholics entering Protestant society.

THE SLAVS FIRST CAME TO THE TERRITORY OF PRESENT CZECH REPUBLIC BETWEEN THE 5TH AND MID 6TH CENTURIES.



The Czechs tried to get power back during the uprising against the Habsburgs in 1618. They were beaten and there started a 300 year period of government by the Habsburgs in Bohemia. From the point of view of the Slavs, it was the Dark Age (as far as education, culture etc. were concerned). Economically, however, the region was quite prosperous.

In the 1780s, the National Revival started. In 1848 rapid development of capitalist economies started in the whole of Europe, as well as in our country.

The end of the 19th century and the beginning the 20th century was a period of a strong industrialization of Bohemia.

The Czechoslovak state was founded in 1918 as one of the post-war states founded on the territory of the previous Austro-Hungarian Empire. Not only for the Czechs, but especially for the Slovaks, it was impossible to create their own independent national state and after negotiations a Czecho-Slovak state was founded as a result of "ratio". This state was of a democratic orientation and until the Second World War it was economically and culturally prosperous.

In 1939 two decades of democracy in Czechoslovakia were over. The Western countries, hoping to secure peace for West Europe, "gave" Czechoslovakia to Hitler. The first independent Slovak State was founded in Slovakia. The Slovak State was, however, of a fascist orientation.

After the Second World War, in 1848, political power came into the hands of the very active Communist Party. This was the reason, why we became, for the next four decades, isolated from the West-European democracies. Capitalist economy was replaced by the building of socialism, democracy was replaced by a one-party system, individual development of the personality was replaced by collective education. In 1968 the reform communists tried to improve the socialist model, preparing the well-known "socialism with a human face" system, under which a strange mixture of market and centrally planned economies would come into existence. This attempt was defeated by military interference of the armies of the Warsaw Pact. The twenty years of "normalization", the period of the deepest destruction of our society in this century, started.

In November 1989 the democratic revolution, initiated by students, took place. The country's representatives radically parted ways with socialist ideology. However, nowadays, problems which originally seemed to be of less importance because they were more or less hidden, have unexpectedly appeared. First of all the national problems appeared, i.e. the controversy between the Czechs and the Slovaks concerning the future of our common state. Next, the problems concerning the displacement of the German population from the border areas after the Second World War and reciprocal restitution questions seem to become very serious. Problems of racism (especially against the Rom population) also have to be solved.

In the beginning of 1993 Czechoslovakia split up into two independent states, Czech Republic and Slovak Republic.

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International Relationships

If we think about the development of the Czech Republic in a long-term perspective, it is necessary to deal with international relationships from at least three points of view:

1. What is the position of the Czech Republic in Central Europe, in Europe as a whole and in the world?
2. What long-term international tendencies can influence the Czech Republic?
3. How can the Czech Republic inspire and influence international events?

The Position of the Czech Republic in Europe

The Czech Republic has an important position in Europe. Geographically it is located in the centre of Europe (although politically "Europe" was further west in the past). The Czech Republic, together with the Slovak Republic, Hungary and Poland, forms a border between eastern and western cultures. What is important for us is whether this territory will be a buffer zone, a barrier in the future or whether, on the contrary, it will be a place of meetings and the mutual enrichment of cultures.

It is likely that there will be a considerable intensification of West-East transport. We should consider what an economic and transport hub between Germany and Russia (plus China) could mean for us.

A return to Europe became a symbol of the 1989 revolution. Our aim, generally accepted and clear, is to enter the European Union, if possible by the year 2000. Entry is linked to a great number of legislative changes (even in the field of the protection of the environment) and to a certain level of economic development. The broad-mindedness of the then European Community towards Portugal, Spain, Ireland and Greece may not be repeated in the case of the four central-european states (paradoxically these particular poorer states of the European Union can slow down our entry).

In the East, independent states are appearing that may for a long time be a source of instability and a potential threat even for central-european states. In the case of civil war, poverty and starvation, a migration of refugees from East and South-eastern Europe may occur. Could this process be a beginning, could it prefigure an explosion of dissatisfaction and migration from the poor South to the industrialised North? How should central Europe react to this danger? What will the European Union do?

Not so far from us a great and potentially influential future partner - Ukraine - was born. It is bigger than France, with great natural and raw material resources and with large markets.

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Global Long-Term Tendencies and Their Influence on the Czech Republic

The Czech Republic may in the future be influenced by tendencies that are discussed in the works of the world's distinguished futurologists. Here we will give only a short outline of these works; we dealt with this problem in detail (P.N.) together with Mikuláš Huba in the book "The Endangered Planet" (1994, in Czech).

Interest in global problems has been developing intensively since the beginning of the 1970's, when some world crisis situations appeared (e.g. the crude oil crisis in 1973), or already existing problems have become acute (the problems of starvation and poverty).

Developed countries are gradually moving from the industrial era to the postindustrial or information era (e.g. in the U.S. as early as 1955 the number of intellectual workers in the sphere of services exceeded the number of manual workers - Toffler, A., 1980); on the other hand more than a half of mankind suffers from an acute shortage of the basic necessities of life.

According to various calculations, in 1989 the Czech Republic was, in key sectors, between 15 and 40 years behind the most developed national economics. It is likely that we are at the peak of our industrial development and we should try to transfer to the postindustrial era.

Industrialisation has brought great ecological and other problems that are increasingly becoming global. We can less and less learn only from our own past experience, the importance of forecasting the future (learning from scenarios of possible futures, so-called anticipatory learning) will increase.

The future will be marked most by the change of technosphere into infosphere (even today information is becoming the most valuable commodity). If for industrialisation it was coal, steel, electricity and railway transport, then in the future it will be computers, electronics, biological branches and genetics, the use of space and oceans and the use of new kinds of energy and technology.

Six characteristics of the industrial era will be according to Toffler (1980) changed or reversed. Standardisation will be replaced by diversification, specialists will be complemented by generalists understanding the broader connections between phenomena, work and the arrangement of working hours will be individualised, concentration and centralisation will be replaced by dispersion and decentralisation and our fascination with growth and size will be replaced by a return to the philosophy "small and various is beautiful".

In developed countries, the proportion of creative, mental work is increasing sharply, non-material elements in world trade are increasing as well. In connection with all this around the world, there is a revival of small and middle-sized enterprises able to adapt quickly to changing conditions. The following sectors are considered to have a great potential to develop (Ivanicka, K., 1988):

- electronics and computers;
- biological fields (biotechnology and genetic engineering);
- light machine-tool industry (and so-called ecological machinery; P.N.'s note);

- alternative sources of energy;
- development of communication and information systems.

Non-economic activities, branches of the development of man (culture, health care, physical education, education system and social security) will become even more important.

Can the Czech Republic Inspire International Events?

The Czech Republic can inspire international events in at least the three following ways:

a) Our historical experience

We are country that experienced a period of democratic development (between the two world wars) and also a period of totalitarian communist government. The experience with real socialism may be difficult to evaluate for many developing countries where despotic feudal regimes and cruel poverty force many people to look for ways out in radical, violent change and the establishment of a totalitarian or authoritarian system. Similarly, for groups of people in western-european countries (some left-wing educated people or young people looking for an alternative way of life) our painful experience should be a light which shows that our way was a cul-de-sac.

b) Value orientation

Our geographical location, historical and cultural development, economic and ecological situation may mean that the Czech Republic will be forced to find "a third way" of development (although now this term feels pejorative), which, however, has nothing to do with so-called "socialism with a human face" from 1968.

From the economic and ecological points of views these efforts can lead to a search for a model of a market economy, which respects social and ecological viewpoints.

c) International development aid and co-operation

We now accept development aid from western countries. We, apart from reasons of human solidarity and tolerance, should not be refused this aid for two other reasons:

- in 1939 we were abandoned by the western powers and this negatively determined our development for five decades;
- together with other eastern-european and central-european states we convincingly and involuntarily showed that there is no way to social justice through the ideas of marxism and leninism and in this way we may have saved other countries from a similar experience.

IN 1989 THE CZECH REPUBLIC WAS, IN KEY SECTORS, BETWEEN 15 AND 40 YEARS BEHIND THE MOST DEVELOPED NATIONAL ECONOMICS.

THE FUTURE WILL BE MARKED MOST BY THE CHANGE OF TECHNOSPHERE INTO INFOSPHERE.

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But at the same time we should not forget that from a global point of view we still rank among developed, industrialised and privileged countries. We will be increasingly confronted with the absolute poverty of the countries of the South. Some nations (e.g. the Netherlands and Sweden) give more than 1% of their gross domestic product in development aid and co-operation to the countries of the Third World. But there are other forms of co-operation that can be useful and that can be extremely useful even for our society. If we are not willing to offer our financial or material support today, we can share our talents, our intelligence and our experience. Government and non-government organisations in the Czech Republic can join existing international programmes of advancement and they can set up other projects. Our specialists, above all young people, who are willing to travel abroad receiving only their expenses, could work as teachers or doctors. It is possible that we will manage to empathise with the real needs of people, who live in different cultural, natural and socio-economic conditions, more than our more industrially and technically advanced neighbours. This help can be effective and not too financially demanding. For those who provide the help, it can also bring language and specialist improvement, a wider range of outlook and a recognition of the variety of the world. Then our society will better understand mutual global connections, it will more easily throw off provincialism and isolationism and it will become more sensitive towards the whole world, not only towards the western half. In this way the Czech Republic can "cheaply" gain a high international reputation and contribute to what the whole planet needs today and is so neglected: to mutual respect, tolerance, recognition, solidarity and to the spiritualisation of our values and aims.



The State of the Environment

Originally, before more intensive human settlement, the countryside in central Europe was about 90% covered by forest. In the Middle Ages there occurred great deforestation as the landscape began to be used for agriculture (mainly alongside rivers, in lowland areas, hilly country and river basins).

Approximately 150 years ago, the intense development of capitalist enterprise and industrialisation started. Mainly Bohemia changed into the industrial centre of the Austro-Hungarian Empire. After World War I, Czechoslovakia ranked among industrial, developed states. After World War II, Czechoslovakia, together with Eastern Germany, became "the smithy of socialism", which in the course of four decades would cause a great over-industrialisation of the country, where preference was given to heavy industry with a high consumption of energy and raw material (in this way the economic dependence on the Soviet Union was intensified). It was mainly this factor, accompanied by the technological backwardness of our factories in comparison with the European standard, which was the reason for the obvious worsening of the quality of the environment from the beginning of the 1970's.

AFTER WORLD WAR II,
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The state and the development of the quality of the environment has been described and documented in many publications. These include, in particular, "The State and Development of the Environment in Czechoslovakia" (Vavroušek, J., Moldan, B., 1989, in Czech), and "The Environment of the Czech Republic" (Moldan, B. et al., 1990, in Czech), then there are the "Year-Books of the Environment of the Czech Republic", published by the Ministry of the Environment of the Czech Republic, and the chapters devoted to the environment in the "Statistical Year-Book of the Czech Republic". From recent publications it is possible to mention above all the report compiled by Hana Kolarová "The Environment of the Czech Republic 1989 - 1994" (1995, in Czech), and a comparison of the state of the environment in our country with the situation in Europe, written by Jaroslav Benes ("The Environment in the Czech Republic and in Europe", 1995). Therefore we did not consider it necessary to give here the characteristics of individual components of the environment and we refer those interested to the appropriate literature.

But to evaluate and understand the state and development of the environment, it is necessary to create a *model of the environment* which will enable us to investigate particular phenomena and the mutual connections between them. For this purpose we will use the model of the ecological system of society, created by J. Vavroušek, 1990 (revised). He distinguishes three basic points of view:

- components of the environment and their quality;
- factors influencing the quality of the environment;
- consequences of changes in the quality of the environment for man and society.

In all these points of view there are distinguished the levels of phenomena, which differ from each other in the extent to which they directly or indirectly influence the environment, and in the speed with which they influence the environment:

- primary phenomena - immediately clear, usually measurable;
- secondary phenomena - less clear, indirect and usually appearing after a delay;
- tertiary phenomena - with deep, often "hidden" connections often showing themselves after a long delay.

Among the components of the environment which are exposed to the influence of man are air, water, soil, forests, genetic pool and agricultural cultures. Also, sources of raw material and the residential and working environment of man have deteriorated.

The threat to the quality of the basic components of the environment leads to secondary (derived) phenomena, among which there are:

- accumulation of alien elements in the environment;
- climatic changes;
- changes in the self-cleaning characteristics of ecosystems;
- changes in the hydrologic state of the landscape;
- changes in the aesthetic values of landscape.

5

In this way the ecological stability of the landscape is substantially disturbed and the natural wealth of our republic is impoverished.

We can divide the factors that cause a negative development in the quality of the environment in the Czech Republic into natural phenomena and internal and external anthropogenic factors.

We will pass over here the influence of natural phenomena (changes in solar activity, tectonic phenomena etc.).

External anthropogenic factors: pollutants are imported into the Czech Republic mostly by air, (but in total our export of pollutants transmitted by air is about one third higher than our import), or by water (here our "export" of pollutants into neighbouring states prevails totally), and there is also a danger of the import of waste.

The positive factors are international co-operation, the help of more advanced countries and their pressure to change our legislation to discard out-dated technology (this is becoming more and more important, above all in connection with our expected entry into the European Union).

Internal anthropogenic factors, i.e. the influence of human (socio-economic) activities on the landscape, are the most important. Division into sectors is the best arrangement. Attention will be paid to the characterisation of individual sectors in separate chapters.

The sectors which negatively influence the quality of the environment in the Czech Republic most include the energy industry (from the burning of low-quality lignite comes about 75% of all emissions), the agricultural-food complex (the deterioration of surface and underground water and the degradation of the landscape), metallurgy, the machine-tool, chemical and electrotechnical industries and the building industry. Transport and in some regions and localities also the army have a negative influence.

The consequences of changes in the quality of the environment for man and society are as follows:

- a deterioration in the quality of the human food chain;
- the somatic and psychological stress of the human body;
- a lowering of the quality of plant and animal husbandry in agriculture;
- a lowering of the volume and quality of wood;
- a lowering of the volume and quality of industrial production;
- problems with the water supply;
- the quicker deterioration of machines and buildings;
- an increase in the costs of reducing and compensating for damage;
- a fall in the effectiveness of our exports because of the bad ecological parameters of products;
- international pressure for the limitation of our "export" of pollutants.

Among secondary, deeper, less clear but more serious consequences of changes in the quality of the environment there are:

- the destruction of material cultural heritage;
- economic damage and loss;
- the disturbance of international relationships;
- a threat to the biological substance of man (a worsening of people's health, genetic pool and the reproductive ability of the population);
- the disturbance of the social structure of society;
- a threat to the political system of society;
- changes in the value orientation of citizens.

The present state and development of a quality environment is a determining factor in the development of the economy. An acceptable quality of environment is a fundamental precondition for the dignified existence of man and society.

On the level of primary phenomena (e.g. the emission of SO₂ and the content of nitrates in surface water), pollution has been decreasing in the last couple of years. Nevertheless, on the level of secondary phenomena, (e.g. the health state of the inhabitants and the erosion of the hydrologic system in the landscape), so far there has been no improvement. Therefore we cannot yet say, that a fundamental improvement in the quality of the environment in our country has been attained.

What Does it Mean "Sustainable Development"?

Definitions

a) The Assembly of IUCN (1973): "Conservation is a way of managing (consisting of inspection, research, preservation and usage) the atmosphere, water, soil, mineral resources and organic systems, including man, so as to achieve the highest tenable quality of life".

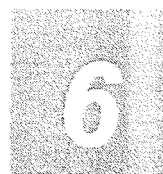
b) Brundtland et al. (1987, p. 43): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

c) Brundtland et al. (1987, p. 46): "In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations".

d) Brundtland et al. (1987, p. 65): "In the broadest sense, the strategy for sustainable development aims to promote harmony among human beings and between humanity and nature".

6

A SUSTAINABLE WAY OF
LIFE IS BASED ON THE
RECOGNITION OF
RESPONSIBILITY
TOWARDS THE PRESENT
AND FUTURE
GENERATIONS AND ON
RESPECT FOR ORGANIC
AND INORGANIC NATURE.



e) Chiras (1993): "In an ecological context, sustainability means quite simply life within (the limits of) the carrying capacity of the biosphere".

f) Vavroušek (1994): A sustainable way of life is a way of life that approaches the ideals of humanism and the harmony of relationships between man and nature, and all this in an unlimited time perspective. It is based on the recognition of responsibility towards the present and future generations and on respect for organic and inorganic nature.

Common Elements of Definitions

More detailed analysis of the content of individual definitions of sustainable development make it possible to abstract from them several of the most essential common elements:

- sustainable development is a purposeful process of change in the behaviour of human society;
- development is understood as reaching the highest sustainable quality of life, or an increase in the potential to satisfy human needs and aspirations;
- development should ensure not only intra-generational but also inter-generational equality (justice) in satisfying the needs of people (retaining the possibility of choice for future generations);
- development should support harmony between mankind and nature, life within the limits of the carrying capacity of the biosphere, or (in a consistently ecocentric understanding) ensure, besides intra-species equality (justice), also inter-species equality (justice) in the distribution of goods or in the satisfaction of the needs of people and other beings.

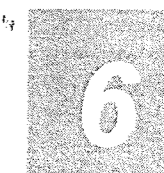
Suggested Modifications of the Definitions

a) "Normal" variant

Sustainable development is a purposeful process of change in the behaviour of human society towards itself and towards its surroundings (the landscape and its resources), aimed at an increase in the present and future potential to satisfy human needs and aspirations consistent with the possibilities (limits) of the landscape and its resources.

b) More consistent "ecocentric" variant

Sustainable development is a purposeful process of change in the behaviour of human society towards itself and its surroundings (the landscape and its resources), aimed at an increase in the present and future potential to satisfy the needs of people and other beings consistent with the possibilities (limits) of the landscape and its resources.



In conclusion we can say that we increasingly feel *the need for a new integrative synthesis of economy and ecology*, overcoming the restrictions of a classical, neo-classical, marxist or any other well-established economy.

Groups of the Most General Principles and Attitudes

a) At any level of space or time, the Earth's landscape consists of all its natural resources (i.e. landscape space and time, water, the biosphere, raw materials, soil, organisms in all their biotic variety with their genetic resources, populations and associations) and the processes of their reproduction. The Earth's landscape is the basic integrated life-support system, which is controlled by fundamental natural laws and which enables, among many other functions and processes, also the development and welfare of human society and all its lower organisational levels (nations, regional and local communities etc.). Sustainable development and the welfare of human society in the landscape may be possible only to the extent to which human society will behave towards the landscape as a part behaves towards its whole. Therefore it is necessary to apply in this relationship a systemic holistic and hierarchical approach, as well as a co-operative partnership ("friendly") attitude of mutual belonging and the keeping of natural laws.

b) Human society is the most dynamically developing, the most influential and "the most transcendental" part of the landscape. Its developing inner powers, increasing and diversifying needs and demands and also the size and variety of influences of its activities demand a corresponding feedback through the flow of relevant information and adequate inner restrictions (limits), in the shape of which ethical attitudes are able to develop and are based on justice and sufficiency and extended by the (natural or landscape) environment dimension (of environmental ethics), as well as mechanisms (institutions, operational norms, procedures of solving problems) for the implementation of such attitudes. In these ethical attitudes adequate importance must be given to the guaranteeing of livelihood ("basic needs") which is a part of human society and the correction of unjust differences in economic conditions in an atmosphere of peace, security and co-operation.

c) The landscape as a heritage of the past of nature and human society is a result of the historical development of all its subsystems, and its possible future states are to a great extent conditioned by the set of past states (sequential behaviour). This is a reason for applying an evolutionary attitude which enables us to understand the dynamics, continuity and consistency of past, present and future states of the landscape and human society and to keep this consistency with the help of human activity in the landscape in the future.

d) The landscape and its individual resources with various mutual connections are being exploited by more users, including users inside the natural subsystem of the landscape (besides man, especially organisms which it is possible to consider minorities). The long-term development and prosperity of individual areas of society which use natural resources may be possible only to the extent that the control of the development of these areas towards the management of the whole landscape will behave as a part towards its whole. Therefore it is necessary to apply a pluralistic attitude (with equal opportunities for all users), poly-functional, multiple and variant use of natural resources with the maximisation of the positive synergic effects of individual methods of usage (especially those evolutionally incorporated

in the landscape) and with the minimisation of negative effects and risks which at the same time holds that prevention is better than cure.

e) Many important resources in the landscape are limited as far as the quality, quantity, distribution, accessibility or ability and speed of reproduction are concerned. So for their use there is consequently a need to maximise the prudent use of the landscape and its resources through market tools (especially prices, discount rates etc.), innovations and the re-evaluation of traditions, indicating technological changes, qualitative and quantitative savings, substitutions, the possibilities of recycling and the minimisation of increasingly harmful influences. A sustainable level of the exploitation of resources is limited by both the assimilative capacity of the environment towards waste, and the regenerative capacity of renewable resources (by the level of their natural reproduction). The level of the use of non-renewable resources is determined by the level to which they can be totally replaced by renewable resources, e.g. through a "phased" policy of the use of non-renewable resources (Turner 1988). The combined level of the use of renewable and non-renewable resources must be lower than or the same as the assimilative capacity of the environment (Pearce 1987).

f) The proper abilities and means by which human society controls the development of the landscape in a sustainable way possibly are and will continue to be, with respect to the complexity of the landscape, limited, together with the ability to bear the whole responsibility for the consequences of our activities in the landscape. To overcome these limitations, it is necessary to apply as much as possible the principle of co-evolutional self-regulation, consisting in the maximal use of natural evolutionally incorporated (inner) powers and processes controlling the development of the landscape with its resources and in the parallel minimisation of highly "invasive" methods of usage and the high costs of supplementary energy.



Population

The Demographic Situation

The dynamism of the development of the inhabitants conditioned above all by changes in fertility and mortality rates and changing demographic structures is the basis of the development of every society.

The developed countries of the world, where there were favourable demographic changes (a rapid decline in the mortality rate and quite a high fertility rate) in the period after World War II, today face demographic problems, which in the 1960's seemed to be completely marginal. In most cases the fertility rate fell below the level at which the population could replace itself.

The family, in its traditional form, is falling apart. As a consequence of the reduction in the number of newly-born babies and of the decline in the mortality rate of older people, the process of the demographic ageing of the inhabitants has become more intensive. Increasing differences between the poor South and the rich North, in Europe also between Eastern Europe and the rest of Europe including local

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conflicts, lead to the intensification of emigration. All these problems have also appeared in the Czech Republic.

Basic Demographic Structures

On the 1st January 1992 in the Czech Republic there were 10,309,000 inhabitants. This number is expected to increase to 10,610,000 by the 2010. So the total growth of the inhabitants in the Czech Republic between 1992 and 2010 would be 2.9% (for comparison, in Slovakia it will be 10.8% for the same period). After the year 2005 in the Czech Republic it will also be possible to count on an absolute decrease in the number of inhabitants (this absolute decrease could appear earlier).

For optimal not only population but also economic and social development, a balanced age pyramid, ensuring not only continuous entering and leaving the labour market but also a balance of the sexes for entry into marriage, is the most suitable. In the Czech Republic, in comparison with the present situation, there will be a higher number of inhabitants of pre-pension and early-pension age.

During the 1991 census it was again possible in former Czechoslovakia to put religion (the last time it had been possible was in 1950). Although we could expect that atheism would be wide-spread above all in big cities, it is most wide-spread in the most industrial and also the most devastated regions of North-Western Bohemia (Most - 75%, Kladno - 72%, Rakovník - 71%, Ústí nad Labem - 71%). In the capital, Prague, 59% of the citizens said that they did not believe in God.

In the Czech Republic, about 60% of the population consider themselves to be Christians. However the number of practising Christians will be much lower. For instance, according to the figures for Sunday attendance in Catholic churches it was a little more than 3% of the population (we have no similar data for protestant churches).

Reproduction and the Family

While most of the countries of the world are afraid of the quick growth of population, in present-day Europe there are the opposite problems. The average number of children per woman in many places has been considerably reduced to a level below the self-sustaining ratio of 2.1 (in 1991: Italy 1.3; Spain 1.3). A considerable and permanent decline in the birth-rate started in the middle of the 1960's and was attended by changes in the structure of families and the spreading of new alternative forms of family types.

The value orientation towards the family, generally accepted in the 1950's by the populations of the developed countries, is losing its unique importance today and the element of individualism is becoming more and more important. The family and any other personal relationships are considered to be only a private matter which it is not necessary to institutionalise. The heavier stress on the personal happiness of individuals and the satisfaction of their needs leads to more frequent break-ups of the family, its lower reproduction and an increase in the number of incomplete families.



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7

The divorce-rate is a negative phenomenon from the viewpoint of the family and children's upbringing. Divorce is today the most frequent reason for marriages to end. In the past the Czech Republic ranked among the states with a higher divorce-rate. The divorce-rate has linearly increased above all since the beginning of the 1950's. The total divorce-rate reached 38 divorces per 100 marriages in 1990.

The birth-rate (the average number of children per woman) is an important factor in the speed of the demographic ageing of the inhabitants. The birth of children used to be the primary sense and aim of forming a family. The most recent figure for the total birth-rate in the Czech Republic, recorded in 1991, was 1.84.

The average age when giving birth constantly decreased until the middle of the 1980's. Today it seems to have stabilised at 24.8 years. For instance in France and the Netherlands it is 4 to 7 years higher in comparison with the situation in the Czech Republic.

The legitimacy of babies born is an important indirect sign of the change in the form of the present-day family. In Czechoslovakia, the proportion of children born outside marriage in the period between the two World Wars was about 10% (Czech lands 12%, Slovakia 7 - 9%). After World War II these figures have not yet been reached. In this way we rank among countries with a low rate of illegitimacy in the European context.

The divergency of East and West in the development of the demographic characteristics of the family is well-illustrated by the French development of illegitimacy, where a sharp increase in the proportion of children born outside marriage started in the 1970's and today it exceeds 25%. An interesting example is for instance the Netherlands, where illegitimacy was traditionally very low, however "new family rhythms" mean that the figure for this country now exceeds 10%. Children conceived before marriage and legitimised by marriage in the following eight months show the quality of "planned parenthood" of a given country. In the Czech Republic we can observe in the whole post-war period a constant growth in the number of children born within eight months of marriage per 100 marriages. (For former Czechoslovakia it was nearly 45%.)

In the present period of great economic and social change it is impossible not to see also their possible impact on demographic indexes. Let us remember in this connection the enormous decline in the birth-rate recorded in Italy, but mainly in other countries of southern Europe, i.e. in Spain, Portugal and Greece. The economic flourishing of these countries, which it is possible to connect with their entering the European Union, came to light, among other things, by the quick adoption of the demographic models of Western Europe. It manifested itself especially in a steep decline in the fertility-rate, which is today the lowest in Europe.

Nutrition

Criteria for the Choice of Nutrition

The problem of the choice of nutrition, seen from various levels and angles, in the end always formulates the question: "Why does man eat what he eats?" Charles Darwin replied: "Man and his animal predecessors ate always what they were able to find, chew up and swallow."

If we accept this simplification, we can try to formulate the criteria for the choice of nutrition so that the expressions "find, chew up and swallow" are given a general meaning. So the accessibility of food is undoubtedly an important criterion. Another factor is edibility or digestibility.

When there is a choice of food, then other characteristics are important: satiety, taste, the healthy nature of food, or utility, seen from the basis of instinct, later transformed into nutrition habits.

Homo sapiens' nutrition demands were not too high for thousands of generations. There are no problems in the nutrition state, as a result of unbalanced nutrition, in the "hunter - gatherer" type of nutrition behaviour. Only with the "farmer - herdsman" does there appear a dramatic change in the structure of nutrition, influenced by the following factors: with the limitation of nomadism it was necessary to choose a crucial plant that then replaced naturally growing herbs and timber species in a certain place.

While the hunter - gatherer was not forced to store the food for a long time, because he consumed products in the order in which nature offered them and only in the necessary quantity, the farmer - herdsman had to improve the methods of preserving crops to keep them unspoiled for quite a long time. In this way, around 9000 B.C., artificial ways of processing appeared in human nutrition and later also the first alien elements (e.g. sea salt and later rock salt with perfect preservative effects, especially in connection with drying and smoking). Among the threats to survival there appeared the phenomenon of famine, which the hunter - gatherer did not know.

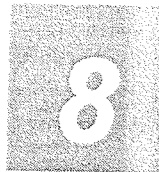
By a fixation on one or a small number of plants, man was threatened by specific malnutrition, i.e. nutrition became unbalanced by one-sided resources (e.g. the food of orthodox Jews and hypovitaminosis C, or the corn food of south-american Indians and pellagra - a disease caused by a lack of niacin).

The next change in nutrition behaviour appeared with the inhabitants of conurbations as early as antiquity and the Middle Ages. Townspeople were greatly dependent on the production of adjacent agricultural regions. Among nutrition risks there appeared the danger of alimentary infection (i.e. infection from food).

It is from that period that some taboos in nutrition appeared (e.g. the prohibition on the consumption of pork among Muslims dates back probably to the 7th century A.D., as a way of preventing anthrozoosis). In some regions with a high birth-rate the production possibilities were soon exceeded (India is an example) and from that period have come other nutrition taboos (the prohibition on the consumption of cattle products).

8

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At the end of the 20th century the populations of the developed countries are called "food shoppers", because they consume only food which they buy and which is produced by other, unknown persons. Haste and artificially caused changes in the frequency and time of eating are new characteristics of food habits. Nutrition consists increasingly of convenience food (which saves time) and therefore the increase of xenobiotic in the food chain. What is new in nutrition is that we can find too much sugar (sacharosis) and saturated fat which we are not adapted to eat in such amounts.

Official Recommendations and Nutrition Consumption: the Picture of the 20th Century

Some societies of the developed countries also have, as a part of their care for their inhabitants, the formulation of nutrition recommendations that should contribute to the solving of serious health and social problems.

The beginning of the 20th century is characterised by the greater and greater differentiation of inhabitants according to income. The serious problems connected with undernourishment culminated after the end of World War I, when, especially in industrial regions, tuberculosis started to appear widely. According to the knowledge of that time, official recommendations reacted to this health problem with the recommendation to increase the consumption of top-quality fat, especially butter, full-fat milk and eggs. During World War II, most inhabitants were exposed to the strict rationing of food, if not actually to hunger.

The post-war period till the end of the 1950's clearly led to an increase in the energy value of food, in spite of the beginning economic problems of most European countries. The nutrition of children is stressed in most countries (as Churchill is often quoted as saying: "There is no better investment into society than to give children milk.").

At the end of the 1950's the nutrition behaviour of the inhabitants of the then capitalist and socialist countries started to differ greatly. The official nutrition recommendations show increasingly distinct differences, especially in the recommendations on the consumption of red meat, full-fat milk and nearly all the food sources of vitamin C. As late as the end of the 1970's, the socialist recommendations remained predisposed towards offal, they actually stressed e.g. the iron content, and also towards smoked meats that were often considered to be equal to other kinds. The consumption of fish and fish products was not stressed in socialist countries without their own sea, so that e.g. in former Czechoslovakia it finally decreased to 4.6 kg per inhabitant per year.

In capitalist countries since the middle of the 1960's, a wave of interest in nutrition has appeared among many parts of the population. Carcinophobia and a fear of coronary thrombosis, which were quickly linked to food, have spread from the U.S.A. On the scientific level the risk factors, which lead to the above mentioned diseases, such as overeating, the excessive consumption of exogenic cholesterol and fats, insufficient consumption of vitamin C and fibre and a high consumption of sugar and rock salt, have been proved.

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The developed countries of Europe and America assume a reasonable level of responsibility for the nutrition of their inhabitants and they, by the consistent application of a nutrition policy, increase nutrition awareness, education and interest.

Factors Influencing the Nutrition Behaviour of the Inhabitants of the Czech Republic

The inhabitants of post-war Czechoslovakia were exposed during one generation to drastic changes of life-style that also greatly influenced general nutrition behaviour. Among objective factors there was e.g. the artificially increased employment of women which started in the 1950's and which had very bad nutrition consequences. The objective nutrition movement stated the advantages of the artificial nutrition of sucklings so that breast-feeding would not prevent women from going back "to production". Children that were breast-fed only a short time or not at all were soon given into the care of child-care institutions where the nutrition was controlled according to norms and where the needs of collectivism were strikingly reflected.

In this way there appeared a generation that, from childhood, had no right to choose their food or to choose the frequency and length of meals. One consequence of these measures was that meals were given to children without respecting their biorhythms, i.e. whether they felt hungry or not and without the possibility of choosing a suitable time of consumption.

In this way food, consumption and finally nutrition in the new generation totally lost their social and later cultural functions.

As a part of the good breeding of socialist man no thought should be given to a given meal and the surroundings in which it was consumed, but a regular portion should be eaten in a well-disciplined way in a regulated time (as laid down in work regulations).

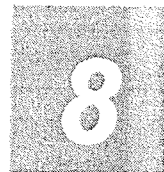
The objective factors that determined the nutrition behaviour of the inhabitants in the 1970's, especially the accessibility of individual foods, increasingly moved away from fruit and vegetables. The market was flooded by meat, including lower quality elements, due to a disproportionate support for animal husbandry.

Also in the course of the 1970's in the Czech Republic the use of unsuitable, sometimes even harmful, packaging of food became the norm. In these conditions a change in the understanding of the functions of human nutrition was inevitable: in the end the satiation side of nutrition was given preference over the other sides (cultural, psychological and social). Nutrition is still understood as a means of survival by the generation born in the 1960's.

Among subjective factors, a shift in value orientation started to play an important role. Generally in the 1970's the "carpe diem" tendency with many undesirable consequences in nutrition behaviour started to predominate. While the long-term and more or less hypothetical effects of nutrition on health were made light of, the short-term or immediate pleasure from food dominated. In this way a liking for

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sweet things, a liking for spicy meals and generally high calorie content food (in some people particularly after overeating there is a secretion of endorphins in the brain which causes a feeling of great satisfaction or even bliss) became embedded.

Nutrition behaviour in the 1980's, especially in the second half, became a vehicle for one type of civil disobedience. The movement for alternative nutrition, connected to some eastern religions, played an important role.

The alternative attitude to the choice of nutrition by the supporters of vegetarianism were, at the end of the 1980's, led by the ecological rather than the health point of view. The remainder of the population was still indifferent both to official and to alternative opinions, they were simply more convinced about the vagueness of the principles of healthy nutrition. Therefore they doubted also the influences of nutrition on health which were totally clear (the consumption of fats and arteriosclerosis etc.).

The 1989 revolution and the beginning of the 1990's opened up the possibility for the inhabitants of the Czech Republic to compare their own nutrition behaviour with that of the countries of Western Europe and overseas countries. Gradually the knowledge of the differences, especially in the consumption of top-quality milk products and fresh fruit during the whole year, began to penetrate into the wider consciousness.

As far as the credibility of official recommendations is concerned, a recommendation from abroad, or taken over from abroad, attracts greater attention. The phenomenon is typical for the Czech Republic, abroad it is very unusual and it is a great surprise for foreign specialists.

One of the reasons for the disorientation of the Czech population on the nutrition question is the absolute non-existence of nutrition education or upbringing. In the Czech Republic it is not possible to obtain either university or secondary school nutrition education. Many nutrition superstitions and myths, e.g. about the necessity of using salt, about the advantages of being overweight etc., are still alive in the consciousness of the population.

Nutrition Policy: the Possibilities of Influencing Nutrition Behaviour in the Czech Republic

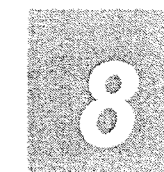
Nutrition policy should formulate the starting principle of the relationship towards responsibility for the nutrition of the inhabitants:

Model A - the adoption of social responsibility for the nutrition of the inhabitants

Model B - the shift of responsibility for nutrition to the citizens themselves

Model C - a compromise between models A and B

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Model A

Model A would be as follows: nutrition policy will ensure access to nutrition which will support the health and welfare of the inhabitants. The tax system (the preferential treatment of the production and distribution of food beneficial to health), legislation (the labelling of food with regard to the protection of the health of the consumer, limits for extraneous elements in food etc.), or price regulation or state appropriations for some commodities (fruit, low-fat milk etc.) will become mechanisms used for this purpose. Nutrition education and upbringing will start at all levels of education and this will be rounded off by systemic educational information for the general public.

The objective factors, such as the price of food and its availability, can be influenced by market forces and the reaction to these new conditions is usually quite quick.

Marketing methods, above all advertising, which is a strong tool in the shift of nutrition behaviour, are connected with supply and accessibility.

Model A with the acceptance of social responsibility was adopted e.g. by the U.S.A., Canada, Belgium, the Netherlands, Finland and many other countries.

Model B

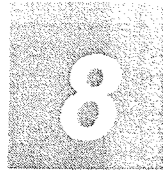
Model B would result from the formulation of a basic principle: the choice of nutrition is the personal concern of each individual. Society does not interfere in the right of people to choose their own nutrition behaviour. The relationship of nutrition and health is only stated, but the support of health is also only the concern of the individual. The price of food will be regulated only by the market, the tax system will not allow any favouritism. Legislation will solve only the problems connected with a direct threat to the consumer, such as e.g. microbiological norms or the limits of chosen xenobiotics.

Nutrition education will depend on the will of the individual, advertising will not be influenced in any way.

The likely tendency of the nutrition behaviour of the inhabitants of the Czech Republic in model B will not differ too much from the behaviour at the end of the 1960's and the beginning of the 1970's. The choice of food will be influenced mainly by prices and advertising. Without basic nutrition education, consumers are easily manipulated through advertising. A preference for "fast food", especially among adolescents and younger people (up to the age of 45), will be likely.

Model C

Several possible variants of nutrition policy can be a compromise between the above-mentioned attitudes to social responsibility. When creating a compromise it will depend on whether a society refuses a certain responsibility a priori or whether for some reasons it is only not able to ensure this responsibility and the duties resulting from this. In the case of simple impossibility (in most cases economic) a



society keeps the possibility of using legislation (e.g. food labelling), also some tax tools (the taxation of e.g. alcohol, while there is no tax relief e.g. on fruit).

The likely tendency of nutrition consumption and health with variant C means on one hand an improvement in comparison with previous years, but on the other hand in comparison with developed countries it will mean the postponement of a solution to accumulated nutrition and health problems.

Children and old people will remain the high-risk groups of inhabitants, but also students and young people without their own incomes may figure here as well.

Nutrition Behaviour: Means of Influencing Nutrition Behaviour in the Czech Republic

In the Czech Republic there is no nutrition education. If we start from variant A of nutrition policy, we will presume the systematic introduction of nutrition information into the curriculum of all types of basic and secondary schools.

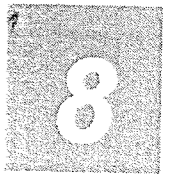
Nutrition education will start at the age of 5 or 6 with general information about food and the encouraging of good nutrition habits (every day low-fat milk, five times a day fruit and vegetable). Children will learn to make the right decisions when choosing food. Active joint decision-making when selecting the menu for the school catering will be an effective part of this education.

With older children it is necessary to reinforce the habits of conscious nutrition attitudes. With children of ten or older it is possible to start to build up their knowledge not only of food, but also of nutrition factors. From the very beginning it is necessary to incorporate nutrition education into ecological education.

With 15-year-old or older children it is suitable to incorporate problematic areas into nutrition education, to evaluate not only the elements of food but also its various influences etc. in an experimental way.

It is necessary to complete this education on all levels with information of an economic character, e.g. on the basis of which criteria to decide when buying etc. An understanding of food labelling and the fundamentals of nutrition toxicology are an independent part of teaching.

The generation with nutrition education will soon create a demand for food which is beneficial to health. It will be able to analyse marketing methods, especially advertising, to which it will not succumb so easily and defencelessly. This will lead to the creation of a new tradition of a "European" or even "world" healthy cuisine more than to a revival of Czech cuisine.



Desirable Trends in Nutrition in the Czech Republic

The aim of the following decade is to reduce the risk factors in nutrition and to increase those elements that support health. According to present knowledge the high consumption of animal fat is an evident risk factor. So far more than 35% of total human energy comes from it. Another aim is an increase in the consumption of fish to at least two fish meals a week (about 11 kg per person per year), consumption of poultry also to two meals a week (about 15 kg per person per year). The consumption of top-quality vegetable oil in a raw state should increase to 14 litres per person per year. The consumption of meat and meat products should decrease (to about 60 to 70 kg per person per year), at the same time offal should totally disappear from the elements of this group. The consumption of milk should shift to low-fat milk and it should reach the amount of 500 ml per day, or an adequate amount of equivalents (yogurts, kefir etc.). The consumption of eggs should be approximately two or three eggs a week. Vegetables should be consumed between three and five times a day and fruit between two and four times a day so that their annual consumption would be at least 95 kg of vegetable and 150 kg of fruit. The consumption of sugar should decrease to at most 25 kg per person per year (from the present 40 kg), the consumption of rock salt should not exceed the amount of three to five grammes a day. The consumption of fibre should reach 30 grammes a day.

It is preferable to consume fruit and vegetables in a raw state, as far as other commodities are concerned it is desirable to do away with frying and cooking food at a high temperature and in oil.

It is necessary to build into the legal consciousness of the inhabitants in future a demand, by right, for healthy nutrition.

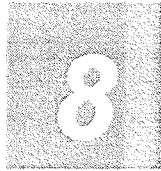
The Model of Nutrition for the Population of the Czech Republic at the Beginning of the 21st Century

It is possible to look at the nutrition of the inhabitants and its consequences anthropocentrically from the viewpoint of the influence on human health, from the viewpoint of the objective satisfaction of the physiological need or subjective satisfaction of social, cultural, psychological, economic and other needs. Another point of view could be a biocentric viewpoint (i.e. influencing the natural balance and biosystems), but also a theocentric one (e.g. reincarnation and the consumption of parts of the dead bodies of animals). It is possible to divide the problems of the development of the nutrition of the Czech Republic's population according to its influence on various factors into the three following structural areas:

a) Nutrition and the health of the population

The nutrition consumption of our population, evaluated according to the results of the long-term monitoring of the global consumption of food, enables us, with a certain interpretative freedom, to make a comparative study. This study makes it possible to select individual nutrition risk factors of chosen common illnesses. On

THE AIM OF THE
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TO REDUCE THE RISK
FACTORS IN NUTRITION
AND TO INCREASE THOSE
ELEMENTS THAT
SUPPORT HEALTH



the basis of the results of this study it is possible to work out a model, or alternative models, of the likely influence of a change of nutrition behaviour on the health of the population.

For this comparative study we have chosen 23 countries from Europe, plus Canada, the U.S.A. and Japan. For the determination of correlations, the data about both the consumption of food and the mortality rate from selected common illnesses and life expectancy were chosen. The following foods were evaluated: meat and offal, fish, poultry, milk and milk products, low-fat milk, cereals, vegetables, fruit, animal fats, oils, sugar and alcohol. From the medical coefficients the following were chosen - the standardised mortality rate, life expectancy at the age of 65, cardio-vascular diseases, ischemic cardiac illness, cerebrovascular disease, malignant neoplasms and malignant tumours of the large intestine and rectum.

The model of desirable nutrition consumption for the Czech population (chart No 1 and graph No 1) is shown in two steps - for the year 2000 and for 2010. The suggested changes in the consumption of some foodstuffs are for the Czech population so unusual, sometimes even opposing traditional nutrition, that the final 2010 model would seem to be quite unreal even in 2000.

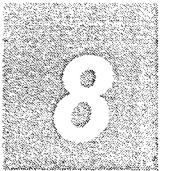
It is possible to assume that this considered change of nutrition consumption will contribute to the optimal reduction of the risk factors of the following diseases: cardiovascular diseases in total, ischemic cardiac diseases, cerebrovascular diseases and neoplasms in total, malignant tumours of the large intestine and rectum and some others. According to the trends in the compared countries, when creating a model of the influence of nutrition on the mortality rate of chosen diseases, it is necessary to take into account the time factor which differs not only for individual diseases, but also according to possible multifactorial influences (smoking, hypokineses etc.). According to the planned nutrition consumption it is possible to expect the following assumed trends of chosen health coefficients in the Czech population, see graphs Nos. 2 - 5.

b) Nutrition and cultural, social and psychological needs

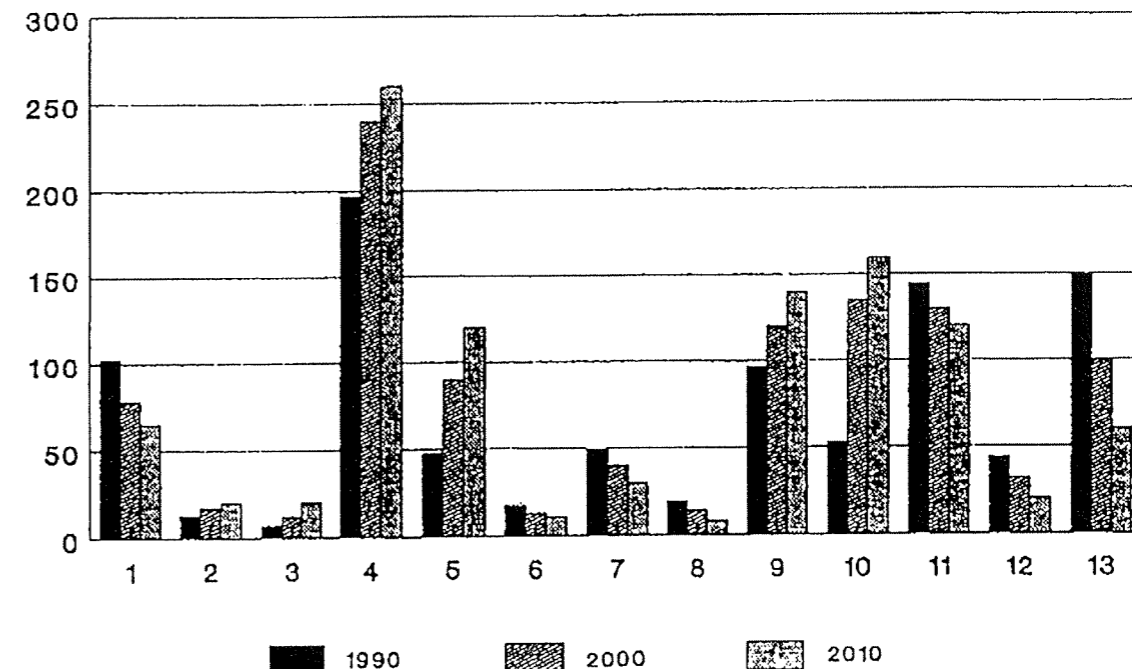
Not only physiological satisfaction, but also psychological and cultural satisfaction are expected from human nutrition.

As a cultural need satisfied in connection with nutrition it is possible to take into consideration the level of the surroundings in which food is found, i.e. mainly bought, prepared and consumed, i.e. the way food is bought and consumed, the kind of food and the way it is prepared, and the surroundings in which consumption takes place. We evaluate the surroundings according to established personal and social norms: we perceive them as inadequate, even disturbing, if they do not fulfill some of our ideas (a great number of people eating in the same place, other customers, noise, dirt and discomfort). Similarly the way it is consumed (in a hurry, at a forced speed, with unsuitable implements, i.e. dishes, cutlery etc.) or the way it is bought (with bad service, insufficient choice and discomfort) can be a source of cultural dissatisfaction. The type of food and how it is prepared are very important from the viewpoint of cultural need. In some countries, especially in eastern ones, the culture of food (its preparation and consumption) is put on the same level, if not higher, than other arts.

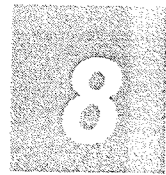
Table an Chart No. 1: The real and desirable consumption of food in the Czech Republic



Food in kg/person/year	1990	2000	2010
1. meat and offal	102.31	78	65
2. poultry	12.78	17	20
3. fish	6.79	12	20
4. milk and milk products in total	196.69	240	260
5. low-fat milk	47.74	90	120
6. eggs	17.43	13	11
7. fats in total	49.88	40	30
8. animal fat	19.25	14	8
9. vegetables	96.43	120	140
10. fruit	52.97	135	160
11. cereals	144.51	130	120
12. sugar	44.33	32	30
13. alcohol	150.78	100	60



CONSIDERED CHANGE OF NUTRITION CONSUMPTION WILL CONTRIBUTE TO THE OPTIMAL REDUCTION OF THE RISK FACTORS OF CARDIOVASCULAR DISEASES, ISCHEMIC CARDIAC DISEASES, CEREBROVASCULAR DISEASES AND NEOPLASMS



In the future it is possible to assume an improvement in the satisfaction of cultural needs by nutrition, which however will not be too closely connected with the optimal model of nutrition consumption itself. Especially with some groups of inhabitants with a stabilised higher economic background it is likely that the phenomenon of the superiority of the culture of food over other cultural stimuli will appear. On the contrary, families with temporary or permanent economic difficulties, that will probably continue to use nutrition as a "buffer" factor in their budget, will become a problem.

The psychological need, which expects satisfaction through nutrition, is determined not only by habit, but also by which species we belong to, by genetic factors, then by immediate emotional mood, the type of personality, experiences, belief, tolerance and many other factors. The strongest taste preference of the species Homo/Homo sapiens for sweet things, which is connected with this species and which makes itself felt especially in more unusual life situations (e.g. stress or on the contrary an extremely positive mood), will probably continue to be a permanently stable factor influencing our choice of food.

On the basis of the experience of industrial societies it is possible to be aware of the more frequent occurrence of the disturbance of the consumption of food, which however is connected primarily neither with nutrition nor with the supply of food, but which ranks among the manifestations of neuroses or even psychoses and which are explained by a worse adaptation to stress.

The nutrition of the 21st century may bring another so far not so evident phenomenon for the Czech population, i.e. informed active decision-making when choosing food. Informed decision-making will call for access to easily available and as extensive as possible information and it will lead to an increase in the level of nutrition education. Society will probably be forced by informed consumers to introduce stricter and more detailed protective nutrition legislation.

c) Nutrition, the environment and the economy

So far, the nutrition of the Czech population, the nutrition of the 20th century, has brought no real benefit either to man or to the other biological systems. These systems are burdened by a uselessly large number of members of trophic chains, by a disproportionately large amount of energy consumed in the production and transport of food resources, by the unsuitable management of waste as by-products of food production, by the uneconomical waste of natural resources (drinkable water etc.), and last but not least by the dangerous replacement of natural biological systems with artificial systems.

The main obstacle to a sustainable future with respect to human nutrition was and probably still is the high production of beef and pork. With regard to relative self-sufficiency in production it is possible to assume that deflection from the consumption of these kinds of meat to poultry and fish should gradually help to create a greater balance in our production systems. This change will undoubtedly have many other economic and social consequences. The transformation of the agricultural and food industries, originally orientated towards the production of meat

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AND PORK

and meat products, may temporarily cause severe problems, which it is however possible to prevent with the help of expert anticipation.

On the other hand with fruit and vegetables, there should be a multiple growth in consumption (of fruit to 300%, of vegetable to nearly 150%). From this point of view it will be important to keep majority representation of home-produced kinds. The advantages of such an attempt are evident: it will support home production, it will decrease the amount of energy used for transport, and in this way also the price of the final product, it will increase the interest of consumers in the quality of the environment in which their food is produced.

With regard to the nutrition traditions of our population a revolutionary change of nutrition for the 21st century is desirable and it would be naive to assume the immediate acceptance of the proposed recommendations by the majority of the inhabitants. Let us spare a thought for the obstacles to a change in nutrition behaviour which are likely to be expected in our population. It is possible to justify the nutrition recommendations for the inhabitants not only from the health point of view, but also from the economic or even ecological aspects. It is likely that ecological reasons will motivate the majority of the inhabitants least, judging according to the reactions to other ecological activities. However not even health motivation is in most cases a guarantee of cooperation: health is very important, but it is not felt as a value by everyone (on the scale of values it goes up only with older people proportionally to health problems).

So it seems that economic mechanisms will be the most reliable motivation or influence on nutrition. But the economy always cared more about the positive short-term consequences of its efforts and it cared less about the negative consequences which were long-term or distant. So a society which is keen on a sustainable future should keep the right to influence nutrition by non-economic attitudes.

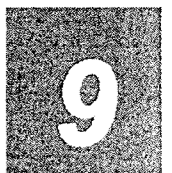
It will be important to systematically increase variously combined motivations and interests not only in nutrition itself, but also to put it more into a global perspective. The nutrition of the 21st century in this way may really become a tool for ensuring sustainable development.

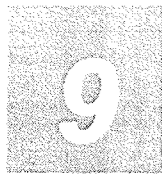
The Health of the Inhabitants

Statistics concerning the health situation in individual countries are noticeably incomplete, because they do not perfectly grasp "health as an absence of illness", but start above all from the coefficients of the "quality" of the reproduction process (the abortion rate, the occurrence of genetic defects, the rate of still-births etc.), ill health, the rate of sickness absenteeism, invalidity and the mortality rate. The mortality rate is the most frequently internationally used characteristic of the health of inhabitants because it is of an unambiguous nature.

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NUTRITION





A high mortality rate is one of the most unfavourable features of the present situation in the Czech Republic. In Europe, on the basis of the level of mortality according to age, it is possible to divide the countries of Europe into two large groups.. The first group, the countries with the highest mortality rate, consists of the countries of the eastern-european region, which includes the Czech Republic; the second group consists of the rest of the European countries.

A HIGH MORTALITY RATE IS ONE OF THE MOST UNFAVOURABLE FEATURES OF THE PRESENT SITUATION IN THE CZECH REPUBLIC

While the average life expectancy of men from eastern Europe is 65 to 69 years, in the rest of the European countries it is 70 to 75 years; women in the East live on average to the age of 73 to 75, in the West 77 to 80. At the end of the 1980's Czechoslovakia, out of 27 compared European countries, was in 23rd place as far as men were concerned (after us came Poland, Rumania, Hungary and the U.S.S.R.), as far as women were concerned, Czechoslovakia was in 22nd place, and after us came Albania, Bulgaria, Hungary, Rumania and the U.S.S.R.

The Development of the Mortality Rate in the Future

All over the world the UNO expects an increase in average life expectancy at birth from the present 59.5 years (the average for both sexes) to 64.1 at the end of the century and to 70.5 in the period between 2020 and 2025. In European countries much slower growth is expected - from the present 73.1 years to 75.4, or 77.2 years, so roughly only by four years in forty. According to the UNO materials, the increase in the countries of western Europe should be only 3.2 years, while in the countries of Eastern Europe 5.6.

The Mortality Rate According to the Cause of Death and Sex

Approximately 90% of all deaths in the Czech Republic are in the long term caused by four reasons: diseases of the cardiovascular system (53%), neoplasms (20%), diseases of the respiratory system (7%) and external causes (7%).

The development of the mortality rate due to the most important causes of death - diseases of the cardiovascular system and neoplasms - is illustrated by figure No 2. While the mortality rate among women in the last twenty years has shown a tendency to decrease as far as diseases of the cardiovascular system are concerned and a tendency to increase as far as neoplasms are concerned, which is similar to the development in the developed countries, the mortality rate among men, with the exception of the last five years, has shown a tendency to increase in both investigated causes.

In the future it is impossible to assume either a decrease in fatal injuries (especially in connection with car accidents) or poisonings and homicides.

The last prognostic calculations of the spread of AIDS around the world and the supposed increasing number of people who will die from it indicate that as early as the year 2000 - until the number of ill people, and mainly the mortality rate due to this illness, is reduced by the discovery of new drugs - the mortality rate caused by the failure of the auto-immune system will represent a stronger obstacle for the prolongation of life expectancy.

90% OF ALL DEATHS IN THE CZECH REPUBLIC ARE CAUSED BY FOUR REASONS: DISEASES OF THE CARDIOVASCULAR SYSTEM (53%), NEOPLASMS (20%), DISEASES OF THE RESPIRATORY SYSTEM (7%) AND EXTERNAL CAUSES (7%)

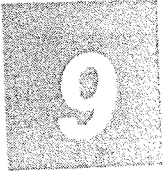
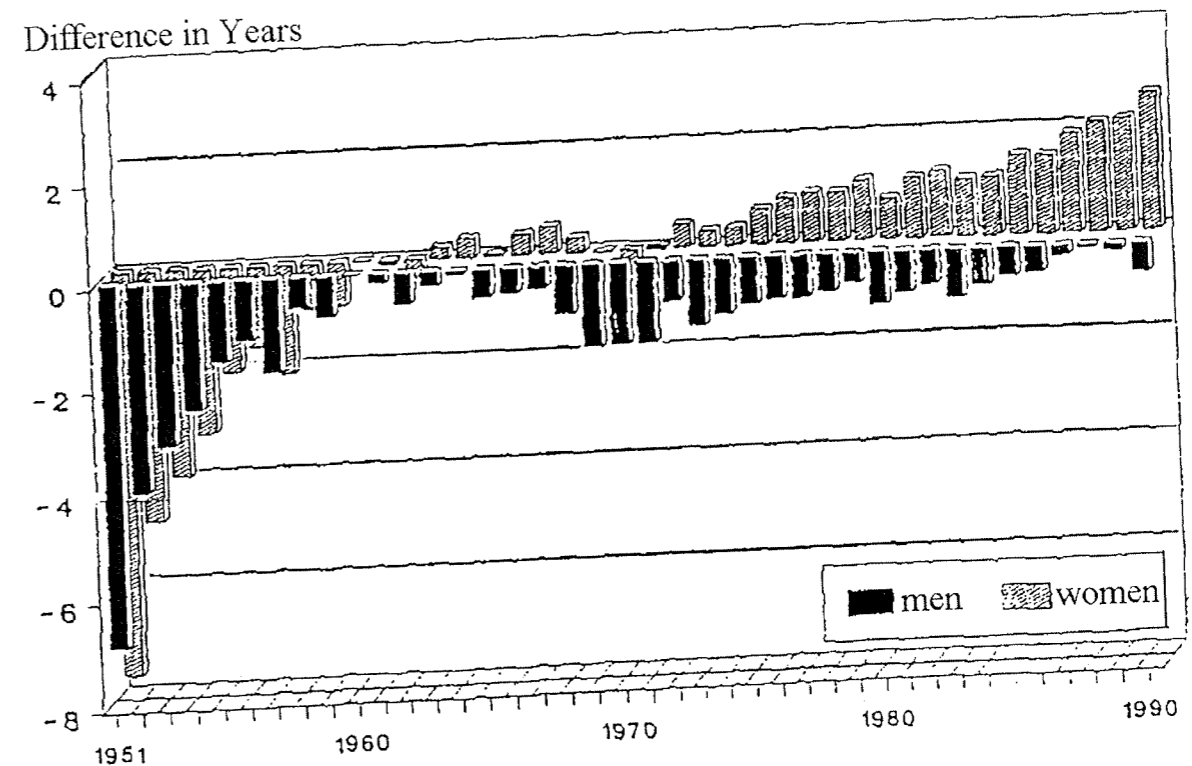


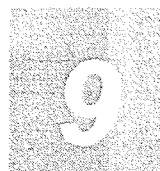
Chart No.2 - Life Expentancy (Age 0) - Variations from 1960 Level



Determinants of the Development of the Health of the Inhabitants

The health of the population is and will be influenced by many outside factors; it is possible to divide them into three main groups: environment, health care and way of life.

The destruction of the environment is often reduced only to the pollution of the air and water, the creation of a hole in the ozone layer and some other, also important but only individual, phenomena. But the reality is much more complicated. The quality of the atmosphere, soil, water, noise, radiation and the quality of food are quite easily measurable and comparable quantities, but it is possible to connect them with coefficients of the health of the inhabitants in the context of other characteristics, above all social environment. Social factors, such as e.g. the divorce rate, education, the unemployment rate, are more and more important in connection with the "quality of health" in changing social conditions.



With the help of a great deal of research carried out in the regions of the Czech Republic, the connection between the state of health of the inhabitants and the quality of the environment was demonstrated, i.e. the lower the standard of living of the inhabitants, the worse the coefficients of the state of health and the coefficients of so-called socially pathological behaviour (crime, drug addiction and the homicide rate). Considering the fact, that the ratio of the factors of social and natural environment to human health is 85 : 15 (according to some authors, however, it is even 60 : 40), it is possible to expect its further development above all in the context of the development of socio-economic conditions.

It is also necessary to see the development of the health of the inhabitants in connection with the development of the way of life. The life style of the present time, connected with a high consumption of albumens and fat, smoking cigarettes with a high content of nicotine and tar, a low level of exercise, an unsuitable regime of work and rest and frequent stressful situations, is a leading factor in the occurrence of most non-infectious diseases. For all the chronic non-infectious diseases it is typical, that their occurrence may be reduced with the help of prevention.

The Relationship of the Health of the Inhabitants and the Quality of the Environment

Among the areas with a strikingly increased mortality rate there are both the areas with a high concentration of industry and inhabitants and the areas with a significant proportion of agriculture and country people, both areas with an extremely disturbed environment and also areas with a relatively satisfactory one. Generally it is true, that the regions with a worse quality of environment correspond in most cases with a high mortality rate, but the connections between both phenomena are not clear, because these "disturbed" regions have also a different ethnic and social structure, usually of a lower standard and with many other negative characteristics of life-style.

An unsuitable way of life increases the influence of the negative factors of the environment, while on the contrary a healthy way of life considerably compensates for them. For instance, when there is an unhealthy nutrition structure, the nutrition increases the risk of other influences of environment instead of intervening positively in the protective mechanisms and in this way helping to reduce this risk when the structure of nutrition is optimal.

From a regional viewpoint the whole western part of the Czech Republic represents a continuous area with the highest mortality rate. The regions with a low mortality rate are located in Southern Moravia. A low mortality rate is typical for men living in the biggest cities, but not for women. Women living in the biggest conurbations have a relatively high mortality rate, above all from cancer. From many regional analyses it is clear, that men are less "sensitive" to the quality of the environment than women.

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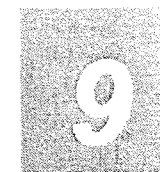


Chart No.3 - Trend of Standartized Mortality Rate - Cardio-Vascular Diseases
(0 - 64 years, both Sexes, per 100,000 inhabitants)

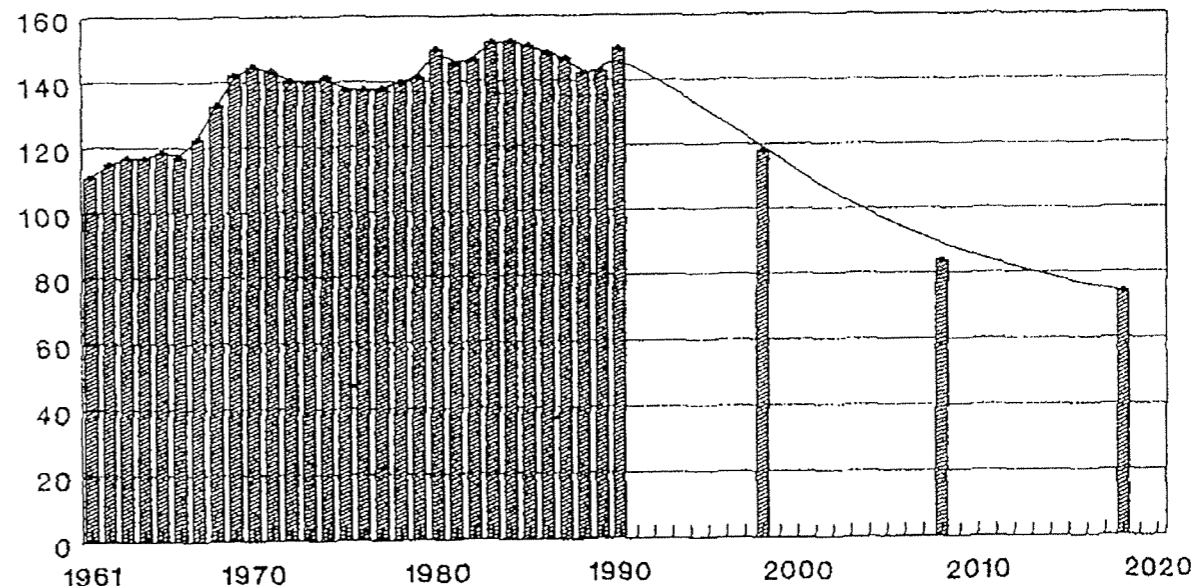


Chart No.4 - Trend of Standartized Mortality Rate - Ischemic Cardiac Illness
(0 - 64 years, both Sexes, per 100,000 inhabitants)

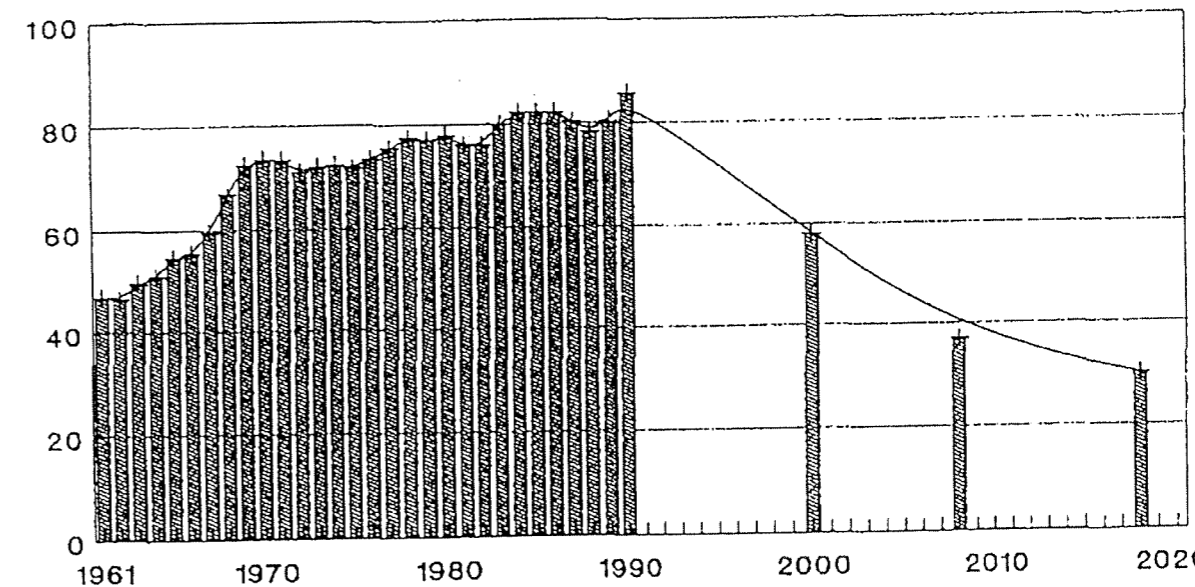


Chart No.5 - Trend of Standardized Mortality Rate - Cerebrovascular Diseases
(0 - 64 years, both Sexes, per 100,000 inhabitants)

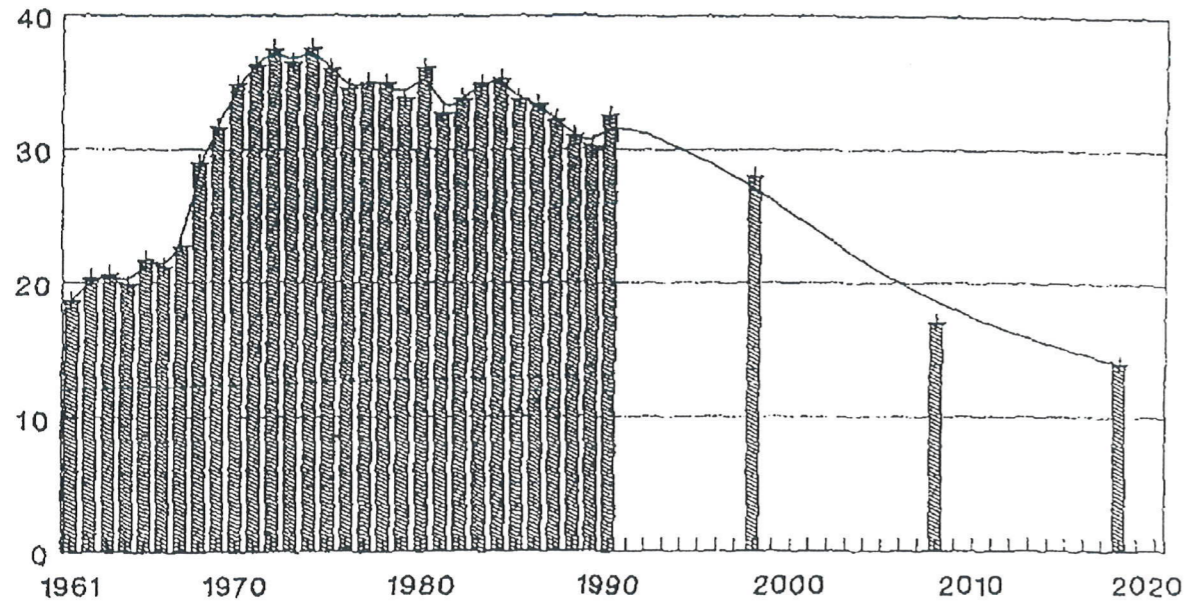


Chart No.6 - Trend of Standardized Mortality Rate - Malignant Neoplasms
(0 - 64 years, both Sexes, per 100,000 inhabitants)

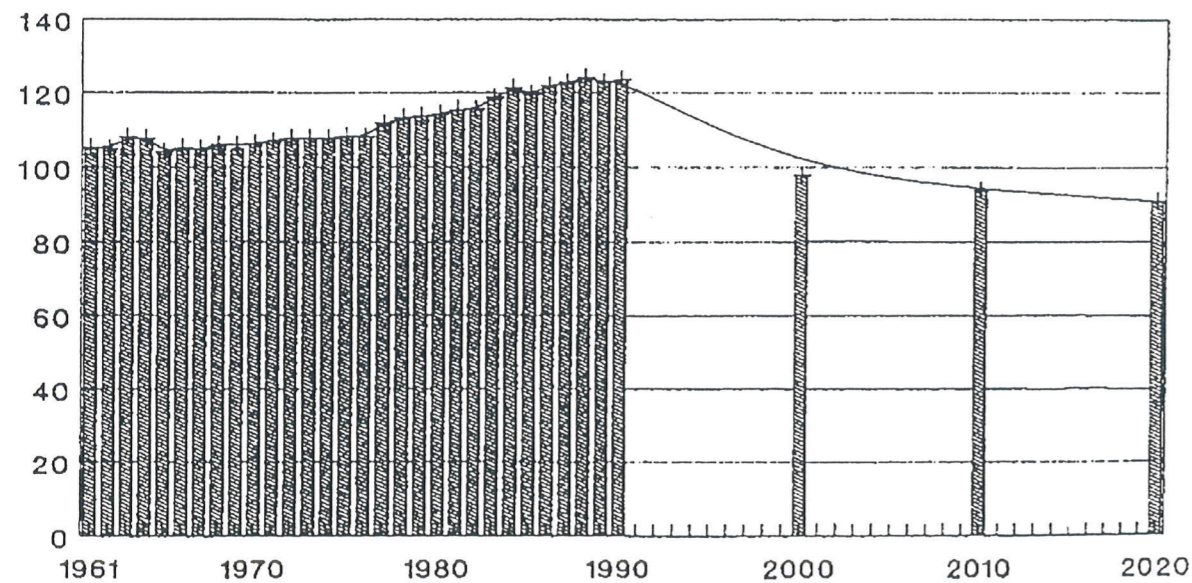
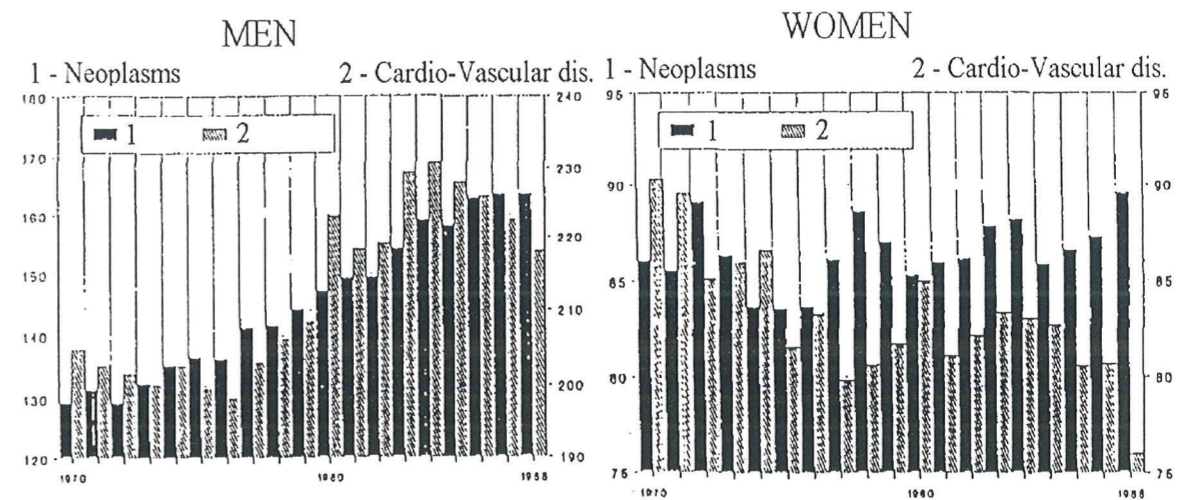


Chart No.7 - The Standardized Mortality - Cardio-Vascular System
(0 - 64 years, both Sexes, per 100,000 inhabitants)



Urbanisation and Settlement

Bohemia and Moravia differ in their structure of settlement and their development.

Prague is the only city with more than one million inhabitants. In the category 70,000 - 1 million inhabitants in Bohemia there are 8 cities, in Moravia 6 cities. In the category 30-70,000 inhabitants in Bohemia there are 12, in Moravia 14 towns. In the category 10-30,000 inhabitants in Bohemia there are 63, in Moravia 42 towns.

From the above-mentioned figures it is clear that there is a fundamental difference between the structure of settlements in Bohemia and Moravia. In Bohemia the evidently important center is Prague, in Moravia there are three towns which are approximately equal centres (Brno, Ostrava and Olomouc). In Bohemia the inhabitants, with the exception of Prague, are concentrated into six other urban conurbations mostly just below 100,000 inhabitants, but there are fewer middle-sized towns. Moravia is characterised by an even, decentralised location of middle-sized towns (especially in the category 30-70,000 inhabitants) which creates the possibility of forming relatively independent regions (such regions are e.g. the Jihlava region, the Znojmo region, the Zlín region, the Uherské Hradiste region, the Opava region etc.). In Bohemia then the number of small towns, above all in the category of 10-20,000 inhabitants is increasing. This category is strong also in Moravia.

From the viewpoint of historical development, in Bohemia there is again an obvious centre - Prague. In Moravia, many towns of middle size are of greater historical importance than the towns with now a higher number of inhabitants. For instance, Kromeriz, Znojmo, but also smaller towns, such as Straznice, could in the past be compared in importance with Brno or Ostrava. These towns lost their importance usually in the period of industrialisation, often because of exclusion from the main transport network (railways).

The Migration of Inhabitants

Migration, or the moving of inhabitants, is one of the forms of spatial mobility. In former Czechoslovakia migration was systematically monitored from the 1950's.

The system of settlement is the most important element in connection with the migration of inhabitants. It is also impossible to analyse migration without the relationship to the structure and dynamics of the general economic, social and ecological development of society.

The total volume of internal migration in former Czechoslovakia (in 1990) was about 26 per mil, which means 26 migration movements per 1,000 inhabitants of the average state of a given territorial unit. In total, it means nearly 400,000. This intensity means, that every citizen changes his place of abode on average twice in his lifetime.

The post-war history of migration in Czechoslovakia is marked by the expulsion of approximately 2.3 - 2.8 million German (depending which source you rely on), especially from the border territory of western and northern Bohemia.

The second mass movement was mostly the politically conditioned emigration of Czech citizens, caused by the events of 1948. Calculations indicate the possible loss of about 250,000 in the period 1948 to 1950. The organised migration from inland (also from Slovakia) to deserted border regions caused a relatively very high intensity of migration, about 50 per mil. In spite of another organised campaign at the end of the 1950's and during the 1960's, trying to attract inhabitants to the Ostrava region, since the 1950's the number of people migrating inside the country has been smaller.

The 1960's, mainly with its culmination in the political events of 1968 and the subsequent "normalisation", was a consequence of another mass wave of emigration. Calculations for this period give numbers approaching 200,000.

In each of the decades 1970 to 1980, or 1980 to 1990 the number of illegal departures from the republic is estimated to be about 50,000. So the expert calculations show that the total loss caused by illegal emigration between 1948 and 1990 from Czechoslovakia was about 450-500,000 people, mainly with higher education.

Emigration abroad meant that by 1990 there were, according to calculations, about one million Czech people around the world.

From the most important "regularities" of movements of the inhabitants in former Czechoslovakia in the period from the beginning of the 1960's, we would like to stress:

1. In spite of all the above- and below-mentioned changes, the features of relative stability and inertia were in many respects generally typical for migrations in Czechoslovakia over approximately 25 years. From the viewpoint of territory, the decline in the intensity of migration from West to East was and is evident.
2. The importance of moving a short distance increased and on the contrary the importance of moving middle and long distances decreased.
3. There was an evident migration shift of inhabitants from smaller to bigger settlements.

But in the last decade it has been possible to note, especially in some cities and above all in the capital Prague, partial manifestations of the process of deconcentration, i.e. the creation of suburban zones. Small and middle-sized cities (about 10-50,000) are the most dynamic and also attractive groups from the viewpoint of migration.

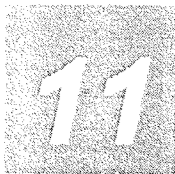
The importance of "economic" reasons for moving has decreased as a reason for migration. On the other hand, the factors of a non-economic nature - the personal relationship to nature (the ecologisation of migration motivation), family and social environment - have become more and more important.

In the course of the last 30 years, migration to Prague (the present annual increase is about 6 to 8 thousand), together with the Central-Bohemian region, has remained stable. Recently, the previously very unattractive South-Bohemian region has been evidently more attractive, the South-Moravian and East-Bohemian regions are now less attractive. On the contrary, the Western-Bohemian and North-Moravian and now also the North-Bohemian regions are not popular at all.

Migration is a selective process from the viewpoint of age. For the Czech Republic, as well as for most other countries, the normal pattern is that migration is most frequent between the ages of 20 - 30, and thereafter goes down with increasing age.

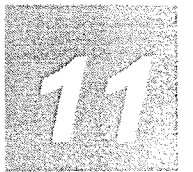
It is very difficult to foresee the future process of migration in the Czech Republic. It is probable that the cost of living of the inhabitants will be the most important factor for migration. Everything will be influenced by the transformation of the economy - especially the processes of privatisation and restructuralisation. On one hand, the stagnation or decline of some enterprises, concentrated in some regions, will result in a decline in work opportunities, increasing unemployment etc. and it will probably cause an increased intensity of migration (the "push" factor). On the other hand, prosperity, the quick economic development of other firms, enterprises, branches and regions will attract new inhabitants.

It is possible to expect that there will appear movements, well-known also from the countries of developed western Europe - e.g. it is possible to expect a change in the composition of inhabitants in historical centres of cities. Old, socially weak inhabitants, in so far mostly devastated flats and houses will be replaced by a younger and "rich" population after renovation and reconstruction. In the same way, it is possible to foretell the more intensive deconcentration of the inhabitants of big



THE TOTAL VOLUME OF INTERNAL MIGRATION IN FORMER CZECHOSLOVAKIA (IN 1990) WAS ABOUT 26 PER MIL - IN TOTAL, IT MEANS NEARLY 400,000. EVERY CITIZEN CHANGES HIS PLACE OF ABODE ON AVERAGE TWICE IN HIS LIFETIME. THE POST-WAR HISTORY OF MIGRATION IN CZECHOSLOVAKIA IS MARKED BY THE EXPULSION OF APPROXIMATELY 2.3 - 2.8 MILLION GERMAN

CALCULATIONS SHOW THAT THE TOTAL LOSS CAUSED BY ILLEGAL EMIGRATION BETWEEN 1948 AND 1990 FROM CZECHOSLOVAKIA WAS ABOUT 450-500,000 PEOPLE, MAINLY WITH HIGHER EDUCATION.

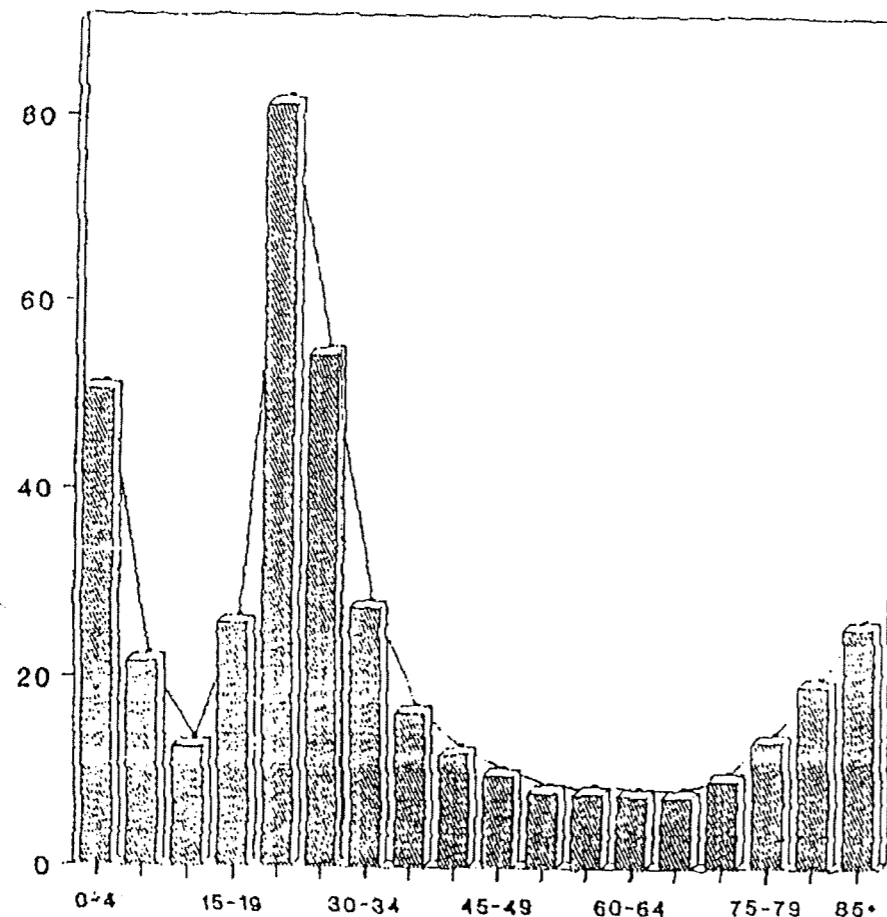


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cities into their surroundings or even their territorial spread e.g. even through the permanent use of recreational houses.

The opening of the iron curtain created in former Czechoslovakia a qualitatively new phenomenon - foreign migration. As a newly established democratic state, the Czech Republic must also gradually accustom itself to its new role as a country of immigration. Besides foreigners with a permanent resident status in the Czech Republic, there are also foreigners with a (so-called) "long-term stay" permit, foreign workers and newly also homeless people and refugees.

Chart No.8 - Intensity of Migration according to Age (Czechoslovakia 1989-1990, Rate per 1,000 Inhabitants)



12

National and Ethnic Problems

It is possible to characterise the whole modern history of Europe as the parallel effects of many factors. The clash of collectivist and individualist ideologies, national and ethnic problems, as well as questions of ownership and social justice are the most important of them. The particular events of the 19th and mainly the beginning of the 20th century are a result of long-term development. Two totalitarian ideologies - fascism and communism - were its actual results. This does not reflect any credit on the prestige of the self-confident European mentality.

It is surely not simply chance that behind both fascism and communism lay the basic problem of nationality. It is fascism and communism that signal a loss of civic principles. But behind this loss, a loss of spiritual ideals in opposition to material needs is hidden.

The question is whether, with the fall of fascism and communism, the hypertrophy of nationalism and its fellow-travellers (militant separatism, ethnic hatred etc.) is also ceasing. Ralf Dahrendorf pointed out that, with the change of economic and political conditions in the countries of Central and Eastern Europe, there have been no parallel cultural and spiritual changes.

Which factors have caused the problems of minorities in the post-communist world to again dramatise our everyday lives, in spite of the fact that totalitarian regimes definitively collapsed? Among them the following factors are the most important: frustration due to the loss of the social security which is typical for paternalistic states, resentment against old elites looking for new ways to assert themselves in power structures, the whole impoverishment connected not only with the material standard of living but through the deformed values, norms, needs and aims above all with the quality of people's everyday lives. Tension in the solution of the problems of minorities goes on to increase the legal vacuum which is typical for the countries which are in the process of transformation from totalitarianism to democracy, and the absence of working institutions for solving serious social problems.

The problem of minorities is usually spontaneously solved in several ways. Generally it is possible to characterise them as assimilation, integration, conflict and isolation. From the theoretical point of view there is no assimilation without giving up national or ethnic identity. To keep it at the cost of isolation or conflict means to repeat the history of violent confrontation. Christopher Lord, in the book "The Hungarian minority in Slovakia"; 1993, in Czech), sees the way out in the cultural autonomy of minorities.

We will try to outline several scenarios of possible development in the Czech Republic with the emphasis on the national and ethnic question in the macrosocial context. At the same time we are aware of that they are oversimplified illustrations.

The first scenario assumes an uninterrupted process of the transformation of society. In conditions of economic prosperity, the scattered Slovak minority (about 600,000 people) willingly assimilates or integrates. The cultural and political demands of this and other minorities will be understood and satisfied without tension and they will contribute to the natural diversity of Czech society. Ethnic and national conflicts will be only a peripheral phenomenon (covering mostly only the

IT IS FASCISM AND COMMUNISM THAT SIGNAL A LOSS OF CIVIC PRINCIPLES. BUT BEHIND THIS LOSS, A LOSS OF SPIRITUAL IDEALS IN OPPOSITION TO MATERIAL NEEDS IS HIDDEN. WITH THE CHANGE OF ECONOMIC AND POLITICAL CONDITIONS IN THE COUNTRIES OF CENTRAL AND EASTERN EUROPE, THERE HAVE BEEN NO PARALLEL CULTURAL AND SPIRITUAL CHANGES

gypsy population and migrants) and they will not exceed the limits usual for the developed democracies.

The second scenario assumes the failure of the transformation of Czech society and consequent political instability. The reasons for it may be various - from the loss of continuity on the political scene (conflicts within a coalition government) to a catastrophic development in Slovakia. The economic and social problems will be explained away as the mistakes of the previous government and by the division of Czechoslovakia. The attempt to get the support of the quite numerous Slovak minority will cause an increase in the aversion of the public and the occurrence of a national problem in the Czech Republic with everything which helps to create it in the present post-communist world.

The third scenario is based on the escalation of the problems mentioned above. Minorities will become a Trojan horse in the rotation of power elites and prolonged political, economic and social crises.

Agriculture

The oldest evidence of agriculture in Central Europe dates back to the second half of the 5th millennium B.C. The earliest farmers mainly grew wheat, barley and millet, but also peas, lentils and flax. They also reared domesticated animals such as cattle, sheep, goats and pigs.

The further development of agriculture was enabled by a knowledge of the production and processing of metals. The knowledge of the production and use of copper and bronze only reached Central Europe at the beginning of the 2nd millennium B.C.

The Slavonic period of our countries from the 5th century is characterised by developed agriculture. At that time nearly all cultivated plants, with the exception of imported plants from America after its discovery, were grown in our country.

Extensive reclamation of boggy regions enabled the agricultural use and cultivation of lower locations and in this way their settlement. Fish-pond cultivation, which started to develop at the beginning of the 13th century, was very important.

German settlers started to come to our lands in the 13th century as a result of controlled colonisation.

Monasteries and other religious institutions, from where new information in the field of agriculture was spread among other farmers, were very important for the development of agriculture at that time.

The rapid growth of towns, the development of trade, crafts and the mining industry in the 16th century caused a constantly increasing consumption of agricultural products. Agricultural production could satisfy the increasing demand only in an extensive way, i.e. by the extension of cultivated land mainly at the cost of forests, i.e. further deforestation of the landscape; at that time about 45% of Czech territory was covered by forest.

After the abolition of serfdom and statutory labour in 1848 there was a great redistribution of land. Also various technological interventions into the landscape, such as the construction of railways, the regulation of rivers, the construction of industrial buildings, or the extension of towns and villages, had a great influence on the redistribution of the land. All this was a result of the enormous industrial development of the 19th and 20th centuries.

In the period 1918 to 1938, on the basis of the law on land reform, there were big changes in the possession of land in our country. According to this law, land belonging to the nobility and estate-owners (arable land over 150 hectares, non-arable land over 250 ha) was confiscated.

The re-distribution of land ownership determined the character of our agricultural landscape. Millions of plots of various shapes, which were preserved till 1948, created a jolly mosaic in the landscape.

Post-war land reform had three phases. The first phase was the confiscation of land (without compensation) belonging to Germans, Hungarians and other "enemies" of Czechoslovakia. Landless people, cottagers, small and middle farmers, owners of land below 15 ha had a right to land. In the second phase of the land reform, estates consisting of more than 250 ha of agricultural land, or 150 ha of arable land was confiscated. The third phase of the land reform started after the communist coup in 1948 with the passing of a new law on land reform. Agricultural and forest land over 50 ha was compulsorily purchased. The third phase totally abolished country estates.

Agriculture and Landscape in the Not So Distant Past

After the communist party took power, the re-shaping of the landscape started so that it would, following the example of the U.S.S.R. suit a collective and large-scale production economy.

In the first stage of forcible collectivisation in the 1950's the established Standard Farming Cooperatives were quite small units with less than 200 to 300 hectares. Scattered areas of greenery and small enclaves of non-agricultural land were preserved.

In the 1960's the second stage of collectivisation took place. Small farming cooperatives were merged with bigger economic units. Also the unification of individual fields into big land units, that often had about 50 hectares even in mountain regions, took place. The scattered areas of greenery were cleared.

At the beginning of the 1970's a great merging of individual cooperatives occurred because of cooperation and specialisation. State farms, which originally worked only a small part of agricultural land, quickly extended after 1948 due to the

13

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confiscation of noble and church estates, "kulak" farms and non-settled areas in border regions.

The larger and smaller areas of scattered greenery and other refuges of flora and fauna disappeared in many places in the present landscape and were replaced by monotonous cultivated steppe. As a result of changes in technology and the use of inadequate mechanisation, the points of orientation in the landscape together with local names disappeared, the accessibility of the landscape both for biota and for people themselves was strikingly reduced and so the agricultural landscape became an anonymous productive territory.

It is difficult to specify precisely the causes which resulted in the present state of the agricultural landscape. The main reasons and tendencies that fundamentally influenced the state of agricultural land are as follows:

1. The abolition of the private possession of land. Due to the collectivisation of the country the relationship of the farmer to the soil he cultivated was disturbed and so he lost the sense of responsibility. Collectivisation also caused a forced movement of skilled members of the young generation to towns, which meant that not only the age but also the qualification structure of rural inhabitants changed. This led to the gradual depopulation of the countryside.
2. The inclusion of Czechoslovak agriculture into the framework of COMECON countries and the attempt to unify agricultural technologies. In practice it meant the unsuitable acceptance of mainly soviet technology, species variety, mechanisation etc., that were designed for completely different geographical and social conditions.
3. The politico-economic attempt to ensure self-sufficiency in food led to a structure of agricultural production in which cereals prevailed even in mountain conditions where their growing demands a high energy supply and leads to ecological complications. Nearly 80% of cereals served as fodder for farm animals.
4. The preference for quantitative coefficients at the cost of qualitative ones when evaluating the results of agricultural farms. Information about the quality of food was secret.
5. Due to the preference for short-term planning over thinking about long-term prosperity there was at most a one-year perspective of judging the effectiveness of agricultural production.
6. The industrialisation of agriculture represented a poor attempt to apply the methods and evaluating criteria suitable for industrial enterprises in agriculture.
7. The centralisation and concentration of decision-making power. It was not agricultural experts but political workers who made decisions.
8. All decision-making had a philosophical basis (gradually ideologised and so vulgarised), which started from two assumptions: the total understanding of the world and on this basis even the possibility of controlling nature according to man's wishes. In this way people tried to adjust nature to production technologies. This led to the official degradation of agricultural land to a production area, of farm animals to a source of meat and of man to labour.

The Present State of Agriculture and Its Prospects

Since the beginning of the 1990's, our agriculture has been in a stage of transformation. The present is characterised by uncertainty and chaos in the behaviour of both the state and the producers. This is connected above all with the processes of restitution, the transformation and privatisation of farming cooperatives into owners; associations.

Agriculture is understood as having three basic functions:

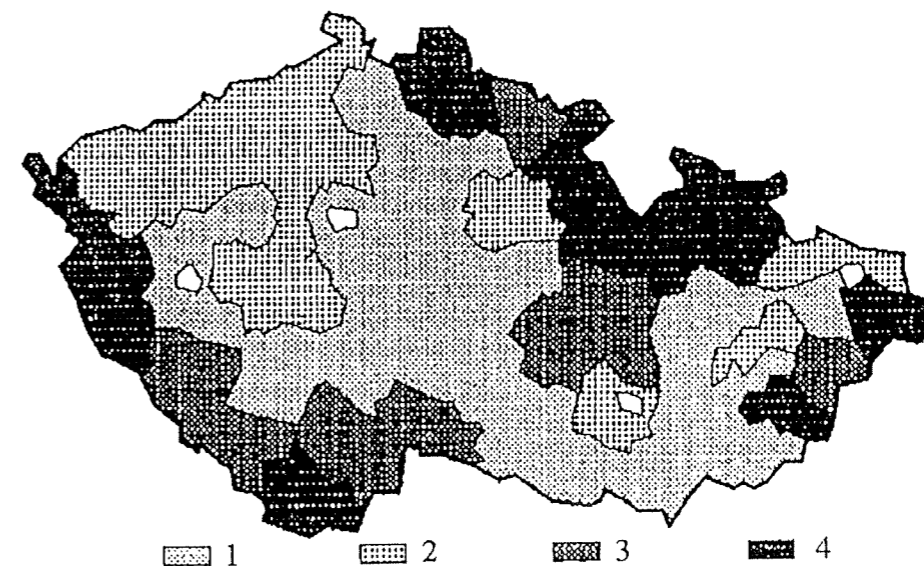
- productive
- social (socially assuring)
- landscape-forming.
-

In various periods each society feels and respects their importance with a different intensity.

When looking into the future, it is possible to assume a decline in the importance of the productive and social functions (the function which assures work opportunities for the rural population) and at the same time a rise in the importance of the landscape-forming (landscape-protecting) function. It is possible to expect a trend towards a polyfunctional (i.e. not only agricultural) use of the landscape.

On the basis of the analysis of a great deal of data we have chosen four basic areas from the viewpoint of the agricultural exploitation of land: potentially productive areas, "ecologically at risk" areas, ecologically valuable areas, strikingly submarginal areas (see figure No.1).

Figure No.1 - Basic Types of Agricultural Areas in the Czech Republic



1 - potentially productive areas, 2 - "ecologically at risk" areas, 3 - ecologically valuable areas, 4 - submarginal areas

1. potentially productive areas - characterised by a higher quality of soil, with suitable transport distances to the final consumer or processor. Areas relatively not burdened by emissions, where at the same time there are no striking clashes with the interests of nature protection and the protection of water resources;
2. "ecologically at risk" areas - characterised by a high level of emission fall-out, lowering the quality of agricultural products, by a greater amount of dangerous waste, areas with mining activity etc. (about 800,000 hectares of agricultural land);
3. ecologically valuable areas - protected areas with important protective functions (protected landscape areas, national parks, protected areas of the natural accumulation of water, zones of the hygienic protection of water etc. - about 1.100,000 hectares of agricultural land);
4. submarginal areas - awkwardly located areas and border zones, mostly in mountain and submountain regions (about 850,000 hectares of agricultural land).

Forestry

The large-scale and long-term global process of the contamination of the environment and the damaging of forest ecosystems by emissions affecting mainly the western and northern part of the Czech Republic influences the present state of forest resources most.

As the most important features of the influence of this process we can consider the fact, that:

- it causes permanent changes in the conditions of the environment;
- it has a cumulative effect and it is a mechanism which initiates a chain of great abiotic and biotic damage. It results in the loss of autoregulative abilities and the destruction of forest ecosystems. This again leads to the jeopardising of the non-productive (water management, climatic and hygienic) and wood-producing functions of forests;
- development trends lead to an increase in the extent and intensity of damage to forests, at the same time an improvement in their condition is not likely even after several decades.

Therefore the need to minimise the consequences of this process will increasingly be a determining element of the strategy and tactics of forestry.

Priority will have to be given to measures such as the preservation and reproduction of the genetic pool of wood species, the rehabilitation and reconstruction of forest ecosystems and protection against damaging influences. The aim is to keep the ecological quality and functionality of forests.

The need for these measures is even more evident as a result of the increasing influence of other factors damaging the forests' resources, such as deer, uncoordinated urbanisation and the activities of the recreation industry, changes in water management and some specific cases of the mass dying out of timber-species, although their importance is lower in comparison with the damage done to forests by emissions.

The second substantial group of processes determining the present state and development of the forest resources and forestry of the Czech Republic consists of two basic conflicts. The first one is a long-term conflict between the real state of forest resources and its desirable (target) state. The second conflict started at the beginning of the transformation from a directive centralist socialist economy to a market economy.

Among the actual manifestations of the first of the above mentioned conflicts there are: the location of more intensive felling according to the planned amount of wood which it is possible to extract without damaging the forest, an increase in the volume of random felling (i.e. the lowering of the safety of production) as a result of inadequate working methods, the disturbing of the age structure and some parameters of the spatial structure of forests (e.g. replanting), the wasteful use of extracted wood (high loss) with insufficient hygiene of the forest (the unprocessed wood of trees blown down in e.g. a storm), the damaging of the forest environment by the unsuitable siting of forest constructions (e.g. forest paths) and by the unsuitable use of technology (above all when replanting, when transporting and storing wood, and when protecting the forests with chemicals), not maintaining the desirable representation of timber-species by replanting, high loss in connection with the artificial replanting of forests, the insufficient use of the natural renewal of forests, inefficient tending of a great majority of young and mature growths (as far as quality, time and intensity are concerned), the one-sided exploitation of economically the most attractive timber-species etc.

The causes of this conflict, whose influence it is possible to expect in present and future conditions, are as follows: a lack of money (it is partly connected also with the unprofitability of forestry), shortages closely connected with the human factor (a shortage of skilled workers, alienation, the deficient composition of the work-force as a result of unfavourable working and living conditions), bad structural policy (e.g. an overloaded wood-working industry with ecologically unsuitable technology, a high wastage of wood and with an extensive character of production, the unfavourable structure of the machine-tool industry), the application of the principle of immediate profit and imperfect economic tools (e.g. the price of woodland, the relatively low price of wood, shortages in evaluating the non-productive functions of forests), the shortage of suitable techniques and technology (e.g. mechanisms for changing the composition of the forest, cableway systems for transporting and storing wood), the low efficiency of checks and the state of management, technocracy and a lack of cooperation between government departments in management, schematism in the choice and application of economic methods, forms, technologies etc.

In the second conflict mentioned above we can consider changes of property relations towards woodland, that are of a reprivatisation character, as the most important (they equalise the private and social forms of ownership with state ownership). They are marked above all by a great range of potential influence (from possible influences on the structure of forest ecosystems to the influence on the

14

social situation in some regions), by the great extent of tasks, the considerable extent of objective vagueness, considerable organisational-legal and implementation demands and the resulting long-term character.

The trends which are connected with these changes are as follows: the decentralisation of decision-making and executive power to lower levels of the hierarchy, the strengthening of autoregulative economic and social processes, the diversification and individualisation of the use of forest resources and the growth of the heterogeneity of forest resources.

There are many positive features of the development of forest resources and forestry, such as the increase in the acreage of woodland, the density and supplies of wood per hectare and the decline in the amount of wood extracted by planned production. What is also very important in determining the state of forests is their economic processing, the theory of forestry, an increase in the proportion of forests with a protective special purpose, good results in the damming up of forests etc.

We can expect a growth in the proportion of woodland at the cost of agricultural land in connection with the decline or even cessation of agricultural production in agriculturally unfavourable conditions and also changes in the supply of labour in connection with the increasing rate of unemployment.

On the basis of the previous evaluation of forestry we will try to suggest a framework of the most general principles of forestry policy, which would be as compatible as possible with sustainable development.

The highest principle of state forest policy should be the maintenance of (or a minimalisation of the decline in) the vitality, quality and ecological, environmental and economic (production) functionality of forest ecosystems.

The minimalisation and elimination of the reasons (and therefore also the consequences) of the large-scale and long-term contamination of the environment and the damaging of forest ecosystems by emissions should be the determining element of state forest policy.

The open (above all internationally) development of the information basis of forestry, represented mainly by basic and applied forest research, by the monitoring of the state of forests and by the construction of an information system of forestry as the basis of a new model of managing forestry should be an inevitable precondition of an increase in the effectiveness of these forest measures.

From the viewpoint of the functioning of a state based on law and order, the creation of the legislative principles of forestry are a priority for forestry. The need for such legislative principles is very acute today.

The polyfunctionality of the use of forest resources is also an important precondition for sustainable development. In this connection a change in the proportions of particular ways of using forest resources is the basic systemic measure.

It would be desirable to finalise the ecological fulfillment of the economic (productive) functions of forests.

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However a full-value application of such a strategy is conditioned also by corrections in the structural policy of cooperating departments, above all wood-processing industries and the machine-tool industry.

In the interests of environmentally favourable development it is necessary to complete the process of the legal and actual granting of equal rights to all types of property relations towards the forest. This, besides a new legislative framework of forestry, will demand also the application of more effective economic tools (the price of woodland, the price of wood, the evaluation of the functions of forest beneficial to the public), new attitudes and forms of the economic arrangement of forests and more effective state forest supervision.

The present economic reality and the extent of the tasks of forestry calls for the creation of adequate financial preconditions for fulfilling these tasks through the state fund for the improvement of forests.

Because from many points of view the subjective (human) factor plays the most important role in forestry, the application of an earnest depoliticised management in the control sphere and a more purposeful social policy in the employee's sphere must be a strategic field of forest activity. Outwardly then it is also necessary, besides more productive inter-departmental communication and coordination of activities, to improve relationships between the owners of forests and the public.

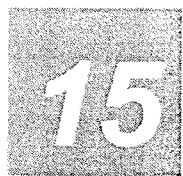
Water Management

The water environment is one of the most affected elements of the environment. Therefore water will become (and in many places has become) a limiting factor in the development of great human activities. From history we know warning examples, such as the extinction of old cultures, the exodus of nations and the change of fertile regions into deserts.

The universality of the negative impacts of changes in the water environment on the life of organisms, biocenoses, and also on human society results from the absolute irreplaceability of water in the life of the above. The physiological adaptability of man to a shortage of water is very small. As an animal species, however, man adjusts well to the shortage of water by active intervention, which guarantees him water in dry periods. From these abilities comes great human activity in the water environment, often meaning great interference in the landscape. River reservoirs are considered to the biggest single changes in the landscape which man has been able to achieve in his history. Even the biggest interferences, however, do not solve the problems with water universally, but only locally.

Great interference in natural water systems are very expensive and technical water constructions rank among the most expensive of all.

15



Water is far from being only a technical liquid, but from the viewpoint of ecology it is an environment with very complicated biocenoses which are inseparable from water ecosystems. The devastation of the quality of water brings great financial losses, which are difficult to calculate. The crisis in the water environment is not a crisis of inorganic nature (the understanding of water as a technical liquid), but on the contrary it is the deep crisis of a biological system.

Research on the Problem

The opinion that, with the help of technical intervention, it is possible to rectify everything in the environment is still widespread. The present great wave of interest in so-called revitalisation is a classical example. Technicians, who previously devitalised the water systems, are now trying, at the expense of a great deal of energy, to apply corrective and very expensive measures without knowing what they are doing.

Monitoring and measuring water flow and various water balances was very popular not such a long time ago. The results of monitoring, lasting many years on the basis of which reliable averages and other characteristic values have been taken, have been obtained for a long time. Conditions in the last decade have been completely different from those which were usual before. Together with new knowledge in climatology today most specialists are inclined to the opinion that we are going through a violent climatic change which is manifesting itself in the northern hemisphere by a rise in the average temperature and less rainfall together with erratic changes in climate during the year. Those phenomena are reflected in water systems by lower precipitation, a reduced volume of water in rivers and less underground water resources. This unfavourable situation is then strongly intensified in the cultivated regions by negative human interference, among which are the deforestation of many spring and retention areas, unsuitable agrotechnical interference in agricultural land, bad agrotechnical measures, the drainage (reclamation) of wetlands, the shortening of the river network, the piping of spring areas etc.

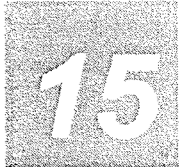
Technology wanted to replace these negative influences by building artificial reservoirs, and many such dams have actually been built. In this way quite a lot of water was obtained but not always where it was needed. Today in our reservoirs there is too much water, even apparently so much that half of this water is not used and has no chance of being used.

The Overall Picture

The majority of the world's water (97%) is located in the seas and oceans as salt water. Two thirds of all fresh water is locked in icebergs and eternal snow. Nor can we use deep underground water (below 800 metres), because its extraction is too expensive and its quality usually is often unsuitable. It is not possible to use most of the remaining 0.7%, particularly water from lakes and swamps, otherwise we would use it up very quickly and in addition this kind of water is usually too far from the place of consumption. To cover human needs we have only not so deep underground water and above all water from rivers, that have the great advantage that they flow and the water in them is constantly changed. So rivers are the most important source of fresh water for human needs, in spite of the fact that in them there is the least fresh water on Earth, i.e. 0.015% in many cases. Rivers are the

WATER IS FAR FROM BEING ONLY A TECHNICAL LIQUID, BUT FROM THE VIEWPOINT OF ECOLOGY IT IS AN ENVIRONMENT WITH VERY COMPLICATED BIOCENOSES WHICH ARE INSEPARABLE FROM WATER ECOSYSTEMS. THE DEVASTATION OF THE QUALITY OF WATER BRINGS GREAT FINANCIAL LOSSES, WHICH ARE DIFFICULT TO CALCULATE

TODAY IN OUR RESERVOIRS THERE IS TOO MUCH WATER, EVEN APPARENTLY SO MUCH THAT HALF OF THIS WATER IS NOT USED AND HAS NO CHANCE OF BEING USED



most important source for our consumption, but at the same time they are the totally irreplaceable recipients of human waste.

Water for the Landscape

In the course of the last few centuries we have been witnesses to the very striking interference of modernising man in the water regime of the landscape, and it is necessary to say, that many such interferences greatly benefit the regions affected by them. One example is the Trebon region, where the introduction of a new water management regime in the past made, from an unalluring Middle-ages moorland, the present favourable settled landscape. Most changes in the hydroregime of the landscape of the temperate zone were connected with draining activities, whose justification was shielded above all by agriculture. Fashionable drainage activities also included brutal regulation of large and middle-sized rivers, then more recently also the regulation of the smallest source areas, including the famous piping.

Too much regulation of water courses was carried out in countries such as former Czechoslovakia, Germany and other densely settled european states, and today the result of this regulation is that our landscape is threatened by aridification.

The damage to our river network is even bigger in the biological respect. The regulation of rivers not only significantly shortened the river network but also devastated a substantial part of our rivers as a biotope. In this way the decimation of the species spectrum with the consequent chain of negative changes occurred. Productivity was reduced, the aesthetic and recreational potential was debased and there was also a great decline in the selfcleaning abilities of our rivers, which are a decisive recipient of waste water and residual contaminated material from cleaned waste water.

It is difficult to say how much water is needed by the landscape, but today we can agree that the Czech countryside is strongly affected by technological and agricultural interference, in most areas it suffers from a shortage of water, and the quality of water is bad.

TOO MUCH REGULATION OF WATER COURSES WAS CARRIED OUT IN COUNTRIES SUCH AS FORMER CZECHOSLOVAKIA, GERMANY AND TODAY THE RESULT OF THIS REGULATION IS THAT OUR LANDSCAPE IS THREATENED BY ARIDIFICATION

Table No. 2: Basic data about the Czech Republic and its water network

Arable soil (including hop-gardens and vineyards)	2,246 166 ha
Meadows and pasture land	832 495 ha
The proportion of the arability of agricultural land	80 %
Woodland	2,629 483 ha
Drainage of agricultural plots up to 1.1.1992	1,005 400 ha
Drainage of agricultural plots up to 1.1.1962	217 800 ha
Ponds	50 728 ha
Total length of recorded streams	80 600 km
Total length of piped streams in 1970	5 600 km
Total length of artificial cannals	16 700 km

15

Water Quality

The practice of modern societies has shown that it is necessary to take care of the purity of water in spite of the high financial cost. If this is not done, the waters are polluted and then they harm human society. Polluted waters become a source of infectious disease, a source of toxicity and the poisoning of both animals living in the water and potentially land animals including man, and it is not possible to use water in agriculture and some industrial branches (food industries). Where polluted water is used for production, there is great expense in recleaning the water or other expenses when using non-cleaned water (non-quality production, the slowing down of the production process, corrosion, quicker amortisation of facilities, hygienic problems, risks etc.).

In the Czech lands the purity of rivers has been very carefully monitored for several decades, partly with the help of the Czech saprobiological indicative method which enables us to measure purity to a high degree of accuracy. According to this research, around 1985 about 66% streams were in classes Ia and Ib of purity, about 17% in class II and about 17% in classes III and IV (the worst). This view is however optimistically distorted by the fact that the purity of the first two classes is connected in practice only with the very upstream parts, where there is not so much water, while most of the economically important streams are already at higher levels of pollution. The stretches of rivers with average flow higher than 20 m³ per second are all at the third, or even fourth level of pollution.

Today we can say that the situation is improving, especially as far as organic material and non-dissolved matter are concerned. On the contrary, even recently the content of dissolved matter was still increasing.

Accidents, which often attract considerable attention, are stabilised as far as the number and extent are concerned, and the situation is becoming slightly better.

The purity of the rivers is included in the programme of the revitalisation of our river network and there is a real hope for the improvement of the situation both as far as spot sources and areal pollution of agricultural origin are concerned.

So far, however, the rivers which are highly polluted or at least have high trophic levels have been ones which leave our territory and this situation could soon be a cause of international problems.

Atmospheric pollution (above all caused by oxides of sulphur and nitrogen) causes the well-known "acidification" of surface waters; the second problem then is an increase in the content of compounds of nitrogen, in short the increase of trophic levels through nitrates. The Czech, especially northern Czech, mountain torrents are often without higher forms of life, because their water is too acidic.

Another hidden danger, which it is necessary to mention, is hidden in underground waters. For human society underground waters are important and irreplaceable, both as the most important source of drinkable water, and as an important source of water for surface rivers. We can see the second function during a period without rain, when all the water in the rivers comes from the underground supply.

15

Recently the pollution of surface waters has spread also into underground waters where, however, it is not very striking and hardly observable. The underground waters are quite well-protected against pollution from surface sources (thanks to the filtration effect of the soil etc.), but once they are polluted, this is a very long-lasting state. Self-cleaning in underground water is very slow, e.g. pollution with crude oil substances will be apparent for decades. Therefore the contaminated sources of underground water are practically lost for the present generations. We know that in underground water today there is relatively very intensive pollution, both from local and above all areal, global sources, among which there is also the above-mentioned pollution through the atmosphere.

The variable nature of the water regime in our country and in some other parts of the world is very striking and it seems to be certain that it is not caused only by natural aridification but also by the combined influence of human factors. We think that one of the so far neglected causes of this dangerous phenomenon is the immoderate collecting of underground water for water-works purposes. In practice, on the whole territory of our republic, there is pumping and collecting equipment, which supplies a constantly increasing water network with water. In this way, dozens of brooks and small rivers in their upper reaches have no water in the dry period of the year. However, this dangerous phenomenon does not affect only small brooks, but also long stretches of rivers important from the viewpoint of water management. Between Olomouc and Litovel, on an approximately 20 kilometre stretch, there are today three important water-works collectors, which take from the flow of the river Morava more than one thousand litres per second and other equipment, with which it is planned to collect at least 400 litres per second, is being prepared. This cubic metre or one and a half cubic metres of water per second is of course missed in the surface stream of the river Morava, whose average flow is here about 20 cubic metres per second, but its minimal flow often does not reach even two cubic metres per second. We are giving this particular example to stress new negative facts which will probably play a greater role in the near future than so far the most popular problem, i.e. the pollution of surface streams.

The accumulation of polluted elements in underground waters is another example of a hidden danger. It is likely that, at some point, contaminated underground water will become the most serious source of the pollution of surface water, above all in dry periods, when underground water is the only source of surface streams.

We may now be witnesses to a crucial change in the relationship between man and water. People are beginning increasingly to realise that, due to their technical activity and predatory attitude, they have overstepped the mark in using water and that the present state endangers the very existence of whole natural, seminatural and artificial associations. Therefore, so it seems, experts, including water managers, are changing their opinions and relationships towards water. For instance, since 1988 no important water-works project has been completed. Regulation of the rivers has been totally stopped and the pressure of the Ekotrans Moravia company for the realisation of a shipping canal has been resisted.

ANOTHER DANGER IS
HIDDEN IN UNDERGROUND
WATERS. SELF-CLEANING
IN UNDERGROUND WATER
IS VERY SLOW, E.G.
POLLUTION WITH CRUDE
OIL SUBSTANCES WILL BE
APPARENT FOR DECADES.

AROUND 1985 ABOUT 66%
STREAMS WERE IN
CLASSES IA AND IB OF
PURITY, ABOUT 17% IN
CLASS II AND ABOUT 17%
IN CLASSES III AND IV (THE
WORST). TODAY THE
SITUATION IS IMPROVING,
ESPECIALLY AS FAR AS
ORGANIC MATERIAL AND
NON-DISSOLVED MATTER
ARE CONCERNED. ON THE
CONTRARY, EVEN
RECENTLY THE CONTENT
OF DISSOLVED MATTER
WAS STILL INCREASING

Prognoses

The problems that will appear in connection with water in our country will not be connected so much with the quantity of water as its quality. A certain shortage of water may show itself in agriculture.

The quantitative statistics of waters in the Czech Republic are judged in a detailed and complex way in a "Directive water management plan". There is a worse situation in the quality of the water environment, and it is not only the purity of water that is concerned, but also the character of river beds, river banks, meadows, and whole river basins. This situation requires an improvement, and our prognoses will start from various alternative solutions to this situation.

Let us start from the assumption that our society will give up totally the effort to gain further profit from the rivers with the help of the so far used classical methods, i.e. "big constructions". We assume that no other collectors, big water power stations will be built, even the Danube-Oder-Elbe canal will not be completed. We also assume, that agriculture will be not interested in new irrigation in the future and that the consumption for agriculture will be basically similar to present consumption. We assume that the majority of activities in the water environment will be connected with the present preservation of what exists, and also with an attempt to improve the situation. Based on these assumptions, the four possible scenarios are as follows:

1. Continuation of the present-day situation

This alternative assumes the preservation of the present-day situation. It means that the problem of water will continue to cause various hidden and visible problems which are difficult to express in figures, however society is not even interested enough in expressing them in figures. Nobody is willing to interfere with this problem too much, the water management enterprises of the "Riverside" type go on receiving money from the state budget, they invest it, and basically they do not care into what. The interest and pressure to solve the water problem will be approximately the same as today. At the same time this alternative assumes that there will be no other accumulation of problems or unexpected situations. The financial demands of this scenario are the same as today, but there is no real economic balance.

2. Economically-orientated scenario

Ecologists and biologists will still not be involved, but the economists, who will manage to put into figures "what costs what", will play the most important role. How much a polluted river costs, how much we lose due to brutal regulation, the bad reclamation of soil, drainage, aesthetic damage, no recreational use etc., and in the light of this knowledge the technical-economic management of water supplies will start to retrieve the present situation. Considering the extraordinary expense of any corrective measures and considering the long-term character, it is possible to expect that, around the year 2015, the period of "great investment", which will draw a lot more money from the budget than today, will still be in progress. The return is quick, but the corrective measures will last for a long time and often it will be necessary to implement more phases before the new system starts to work. Among the corrective measures there is also extensive regulation of riversides including

anti-erosion and anti-deflation measures which show how demanding and long-term these measures may be.

3. Environmentally-orientated scenario

Ecologists, biologists, nature conservationists, environmentalists and other experts will take part in solving the problem and they will put into practice their opinions on a healthy water environment. A long-term corrective programme, that will ask for the same or even higher expenses as scenario No 2, will start.

4. Scenario of unexpected development ("the wild card")

We must admit there could even be a completely unexpected course, provoked either by new information and in this way by a change of opinions, or by new great problems that will appear in the water environment. They could be e.g. the mass poisoning of underground and therefore also surface waters (due to the accumulation of toxic matter, reaching "the limits of growth"), poisonings because of clustered poisoned residue in sediments, or catastrophic problems caused by damaged forests, uncontrollable irregularity in the flow of rivers accompanied by the dissatisfaction of the inhabitants or new knowledge about the harmful influence of unknown matter in water etc. Even in these cases it is necessary to envisage great financial expense. It is difficult to predict when these events may happen or how long they might last.

An attempt to guess the probability of alternatives:

- Scenario No. 3 - 40%
- Scenario No. 1 - 30%
- Scenario No. 2 - 20%
- Scenario No. 4 - 10%

The necessary preconditions for the sustainable state of the water environment can be best realised by combining scenario No. 3 (the environmentally-orientated scenario) and scenario No. 2 (the economically-orientated scenario).

The Principles of Sustainable Water Management

The cooperation of ecologists with economists, thanks to the education in universities, also the creation of an ecologically thinking economist and economically acting ecologist are crucial for a solution to the problems. If this is successful, a new ecological policy in the economy and a new economic policy in ecology might appear.

We will now give the main ideas and suggestions for the principles which should determine what the water management will look like in the following period in our country.

A. Government department - water management must continue to be the responsibility of the Department of the Environment and in addition it must be assured that the prime importance of water is explicitly its importance for the environment.

B. Water management - individual waters will be controlled by a greater spectrum of managers than previously. The state must keep the important water sources under its control. The most important rivers were managed by branches of the firm "Povodi" (Riverside) that recently changed into joint-stock corporations. It might not have been the best solution, because the firm "Povodi" behaves in a similar way as before, only the source of money has slightly changed. Previously they were given money from the state and then they spent it during the year, now they are forced to get the money by collecting generally fixed fees from users, or they will get the rest in the form of the state orders again from the state.

Another striking change which will be realised is the privatisation of waters. We can recall the practice of the first republic, when some parts of our rivers were not kept by the state but by people with water rights, who kept these rivers in perfect condition.

The change must take place also in big water power stations, that are so far, together with the water reservoirs, controlled by the Department of Power Engineering. The dictatorship of power stations must stop, especially in cases such as the nuclear power station Temelin currently being completed, because water for our landscape will be increasingly rare.

Also water in mines must be controlled by the Department of the Environment.

C. The "Water Price Institution" - will be an independent institution that will suggest the price of water, the price for using it, pollution, the price of a kilometre of individual rivers etc. There should be approximately one third economists, one third ecologists and one third water managers. The real price will be finally determined by the market, nevertheless the "Water Price Institution" will be necessary at least in the initial period, when extraordinarily great investment will be decided and when it will be difficult to judge the priorities.

D. The hold-back of water in the republic - is one of crucial moments of good water management. Among these activities there is great landscape interference such as: the restoration of drained wet lands, the replanting of top-quality forests, the abolition of measures for the quick diversion of water from the landscape, the limitation of the consumption of underground water, the limitation of losses of water in the process of production, a re-evaluation of the use of water for energy purposes etc.

E. Minimal and zero flows - are another important problem. The present minimal state of our streams destroys local biocenosis with extensive and long-term negative consequences (a decrease in productivity, a decrease in selfcleaning, the worsening of purity and the trophic level etc.).

F. The regeneration of the functions of rivers - the river network suffers not only from a shortage of water, but also from the loss of a considerable percentage of its useful natural functions (productivity, selfcleaning, drainage, infiltration, irrigation, recreation, environment etc.). The restoration of these functions is

another prime necessity for a change in the development of the water sphere. The present trend of so-called revitalisation is nearest to this process.

G. The salvage of underground waters - it is necessary to reverse the present trend of the gradual destruction of underground water under the influence of large-scale surface (and also spot) pollution and contamination. It is necessary as soon as possible to start an inventory of the quality of underground waters over the whole country.

H. The protection of the quality of surface water - is a process which is already now being carried out in the most concrete form out of all the above-mentioned processes. Besides the continuation of the construction of sewage farms for waste water and the introduction of better technology, it is necessary to solve the problem of the restoration of devastated rivers and the problem of the high trophic level of the rivers.

I. The directive water-management plan - must be fundamentally revised to fit the new situation. The participation of ecologists in its revision is a must. It will continue to be a part of legislation.

The Extraction of Mineral Resources

The extraction and use of non-ore raw material dates back to the Early Stone Age. Fossil fuels are among the most important raw materials. Bituminous coal has been extracted in the Ostrava region since 1782. Lignite began to be extracted around Duchcov in 1403 and in the Sokolov region in 1793.

Since the 5th century B.C. iron ore has been processed in our country. The first written document about the export of silver and tin from the Czech lands appeared in the 10th century. The richness of the mines in Kutná Hora is documented by a year's extraction of silver from the period around 1300 (about 25 - 30 tonnes), which represented 40% of the then European production of silver.

The geological conditions of the Czech Republic are relatively good, but the occurrence of raw materials is conditioned by the small area in which they are found. Therefore the Czech raw material basis is generally characterised as relatively rich, but not complex, only partly covering the needs of the national economy in the present structure.

From the viewpoint of the possibility of covering our consumption by the extraction of domestic deposits, it is possible to divide individual raw materials into the following groups:

1. Raw materials which do not exist in the Czech Republic (Ct, Pt-metals, S, phosphate, K-salts, mica, borates, bauxite).
2. Raw materials which can only be found in limited quantities in the Czech Republic (Fe, Mn, Ni, Co, asbestos, Cu, Pb, Zn).
3. Raw materials which could potentially fully cover our needs and whose resources are capable of further development (Hg, Sb, Sn, W, Ag, Au, fluoride, feldspars, quartz raw material, talc).

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16

4. Raw materials that totally cover our consumption and are an important export, or have the potential to become an export (ores of radioactive raw material, kaolin, heat-resistant and ceramic clays, magnisites, graphite, bentonite, baryta, glass sands, foundry sands, pearlite).
5. Raw materials which are widespread in the Czech Republic, whose extraction is theoretically unlimited and where the basic problem is the relationships between extraction, consumption and clash of interests, above all with the environment and other natural resources (calcite, brickmaking clays, gravel sands, building stone).
6. Raw materials for which there are in our country the theoretical preconditions (Mo, trace elements - Nb, Ta, Cd, In, etc.).
7. Raw materials that it would be possible to use more extensively but where import is considered to be more advantageous (rock salt, decorative stones).
8. Raw materials that are not so far industrially extracted, although they exist in our country (secondary raw materials, esp. abrasives).

Potential Prospects of the Raw Material Basis of the Czech Republic

The character of our territory and its small area limit the complexity of the primary basis of raw materials. The Czech Republic will never be able to reach such a development of extraction that would satisfy the needs of industry. Open-cast sources of the richer ores of traditional metals have been exhausted in most cases. We will always import a substantial part of the majority of metals from abroad and only exceptionally will we be able to export some metals or their concentrates. We cover the high consumption of ores of ferrous metals by import.

The consumption of tin and wolfram ores will increase. Besides already extracted deposits it is possible to verify the reserves which would enable us to cover substantially our economic needs. It will also be necessary to import molybdenum in the future.

Of non-ferrous metals above all copper, lead and zinc are used. The consumption of these metals is mostly covered by import, but it is possible to expect an increase in the satisfaction of our needs from our own resources. The Jeseníky and Krusne Mountains seem to have the greatest potential from this point of view. The extraction of antimony and mercury deposits roughly cover our consumption. In Bohemia the deposits of Krásná Hora (Sb, Au) are being extracted. We do not extract the ores of aluminium, nickel and cobalt and there are no preconditions to cover their needs from our resources.

The deposits of uranium ores in the Czech Massif are important sources of energy. Crude oil and natural gas are extracted in a part of the Vienna basin, although the deposits of crude oil are not extensive and we cover our consumption by import. Coal is the most important source of energy in the Czech Republic. The available sources of lignite ore are, with few exceptions, well-known and it is not possible to count on an increase. Usable resources of bituminous coal are very low.

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THE EXPORT OF RAW
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UNDER THE LAX
SUPERVISION OF THE
STATE, HAS BECOME A
GREAT PROBLEM

17

The total reserves of non-ferrous raw material will cover our needs even after the year 2000. However they are unevenly located and in some places there is none at all.

In the period since November 1989, the export of raw materials, undertaken often by private firms under the lax supervision of the state, has become a great problem. For instance, the export of lime has increased in this way more than twenty times (!) in this period, although the total volume of its extraction is the same.

The Energy Industry

The energy industry in our republic depends above all on fossil fuels and uranium. A smaller amount of electrical energy is obtained from hydro-electric power stations. The firm Czech Energy Plants is the main producer of energy. Also factory power stations and private producers - now primarily the operators of small hydro-electric power stations - also produce electricity. In the production of heat there is greater diversification in comparison with both the sphere of resources and the sphere of producers. The resources of Czech Energy Plants, town heating plants and boiler stations, the resources of industrial plants and district boiler-rooms for individual buildings are used.

The approximate consumption of electricity in the Czech Republic according to sector:

Industry and building industry	60%
Inhabitants	15%
Agriculture	5%
Transport	5%
Other needs and losses	15% (losses related to the total transmitted energy are about 7%).

Prices

The price of energy is still regulated by the state, and price does not include damage to agricultural crops, forests, the environment or health. In nuclear power stations the price of electricity does not cover the cost connected with the completion of the fuel cycle. If the idea of a "breakdown fund" were accepted, the electricity produced in a nuclear power station would become unsaleable.

The price for which the distributing firms buy electricity from private producers is about two and a half times lower than the price they sell it at to other firms.

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The Description of Individual Methods of Production and Resources which It Is Possible to Use

1. Classical steam power stations - in most cases they burn lignite with a heating value of 9,000 to 14,500 kJ/kg, a sulphur content of about 4%, an ash content of 30% and a water content of 30 to 40%. Their operation consumes about 9% of their own output.

The main problems: the large amounts of mining waste, the high cost of the transport of fuel, the high production of oxides of C, S, N; depending on the quality of fuel the radioactive fall-out in the surroundings of power stations, the production of a large amount of ash, the decline in the intensity of solar radiation caused by the influence of emissions, the corrosion of buildings, the damage to forests and agricultural crops, the negative influence on the health of the inhabitants from the long-term (lower average age, higher number of illnesses of civilisation, mutagenic and teratogenic influences) and the short-term (as a result of inversions) points of view, the destruction of the landscape and settlements through extraction, the devastation of citizens' awareness (no interest in culture, public events, in other people, in themselves etc.), social problems e.g. in the concentration of certain social groups, the moving away of some skilled workers and educated people.

Prospects: it is possible to limit the negative influences of burning with the help of modern technology, it is possible to burn biomass (e.g. quickly growing timber species), it is possible to convert the present power plants into ones burning natural gas (with the consequent disadvantage of dependence on the supplier country), it is possible to use fluid burning and a steam gas cycle. There are reserves in the use of waste heat. Ash dumps are homogenic, which is an advantage for possible other use. In the future it should be possible to use the high absorption properties of ash.

2. Obtaining heat - more kinds of fuel are used (lignite, bituminous coal, mazut, heating oil, wood, gas and electricity).

Main problems: to a great extent they are similar to those of classical steam power stations, which are caused by the use of the same kind of fuel. In local fire-boxes using solid fuels there is less efficient combustion and it is necessary to collect ash regularly. In a central heating plant there are losses due to distribution and hot-water pipes can create a barrier in the landscape.

Prospects: a reduction in heat loss, the extended introduction of gas, higher use of wood and other plant matter, the use of biogas and wood gas. It should be possible to improve the use of heating plants by the introduction of a new regime in them - i.e. the combined production of heat and electricity.

3. Nuclear power stations - the nuclear power station in Dukovany with an installed output of 4 x 400 MW is in operation and the nuclear power station in Temelín with a planned output of 2 x 1,000 MW is under construction. The number of miners in the uranium industry in 1989 was 5,450, the number of workers in the preparation plants was 1,950 (but the extraction of uranium is being reduced), the area of dumps and sludge beds was 630 hectares. The development of the nuclear energy industry was facilitated by great investment in connection with military interests.

The main problems: the emission of radionuclides into water and the atmosphere, indestructible radioactive fall-out with a long half-life range (measured in thousands of years), the danger of a possible accident, caused by a technical fault, human error or by the failure of several factors at the same time. Then there is the short service life of a nuclear power station, approximately 30 years (at the end of its working life, a part of the power station becomes radioactive waste), the great heat pollution and the consumption of water (1 - 2 m³/s), considering the fact that a nuclear power station represents central resources of high performance, there are bigger losses caused by distribution. There is a possibility of the misuse of the plutonium for military purposes or terrorism, or a nuclear power station may be subjected to a military or terrorist attack. The disadvantage is the long period of construction of a nuclear power station: 8 to 10 years and the consequent amortisation of capital.

Prospects: an increase in efficiency, more effective safety systems (they are however very expensive), the use of waste heat, the construction of a nuclear power station of lower performance, breeder nuclear reactors (they are now very problematic).

4. Water power stations - Czech energy plants use mainly big water power stations on the dammed reservoirs. The small state water power stations (SWPS) are being privatised. SWPS were in many cases abolished in the 1950's and the 1960's. Before this wave in the Czech Republic there were about 10,500 SWPS that could achieve the installed performance of 1,000 MW (i.e. one of the two blocks of the nuclear power station of Temelín) with the present level of technology. Now non-working SWPS are being renovated and new SWPS are being built. In most cases these SWPS are through-flow power stations.

The main problems: the dependence on hydrologic conditions (especially through-flow water SWPS), during the construction of dams quite often there is a negative interference in the landscape with the influence on the hydrologic regime of underground and surface waters, there are problems with the silting up of the reservoirs.

Prospects: the completion of the renovation of old and the construction of new SWPS in suitable locations, the use of water mills and water-driven sawmills, an increase in the performance of the present water power stations by the installment of more modern technology and other modifications.

5. Wind power stations - today this possibility is largely ignored in our country, only a few wind power stations are in operation. The advantage is the decentralisation of resources, cheap working and the gaining of "clean energy".

The main problems: dependence on the immediate climatic conditions, for the time being a higher purchase price and a slower return on capital.

6. Solar energy - is most frequently used for heating water, abroad also for the direct production of electricity by photovoltaic cells. It is possible to use the solar panels even in the winter months with the help of suitable technology. The advantage is cheap operation and the possibility of local use.

The main disadvantages: dependence on climatic conditions, a large area for installation, for the time being a higher purchase price.

7. Energy of plant biomass - the heating value of wood is nearly the same as the heating value of lignite, or even higher. It is possible to use wood for burning in classical steam power stations. It is possible to get wood gas or methanol by pyrolysis (efficiency 70%), and methane as a by-product of compost by fermentation (efficiency 30%). It is possible to grow "energy forest" with timber species that are easily replantable (with yields of about 20 tonnes per hectare). In Germany they are attempting to grow tropical grasses with the same yield. It is possible to use dumps, spoil banks and areas e.g. where the ore has been exhausted for growing energy plants. In the Chomutov region alone 80,000 ha have been set aside for recultivation. The cultivation of energy plants could also become a suitable complement of agricultural production, especially with the increasing over-production of food. The burning of biomass does not increase the content of carbon dioxide in the atmosphere. Therefore the alternative introduction of a so-called carbon tax for the burning of fossil fuels would make this and other methods of extracting energy from renewable resources more advantageous.

8. The energy of biogas - production is possible from plant biomass (see above), but also in animal husbandry (the advantage of the present disposal of manure), from communal waste dumps and by sewage farms. Before 1989 a project was worked out for the production of biogas in 288 agricultural establishments dealing with livestock (188 for cattle, 100 for pigs) with an annual production of energy 2.07 PJ. With this amount of heat it would be possible e.g. to provide 17,250 flats with heat.

9. Geothermal energy - in areas with hot underground water or by heating water using underground heat. It is possible to use geothermal energy in combination with heat pumps including the use of the low-potential heat of the earth's crust. In the Czech Republic there is little opportunity to use this source of energy though the region of the Krusne mountains has good potential.

10. The import of energy - in the past imported energy covered roughly 5% of our consumption. Most of the electricity was bought in the former Soviet Union. The disadvantage of the import of energy in any state is not only economic but also political dependence.

Sustainable Development and the Importance of "Alternative Resources"

We understand sustainable development in the energy industry as a development that will enable the following generations, even over a long period, to use at least the same number of resources we are using now.

We can see the way to sustainable development in savings and in the use of alternative sources of energy. That means the energy of the Sun, the wind and water, as well as geothermal energy and the energy of biomass (other alternative resources are inapplicable in our state).

Advantages: these resources have a lower output with greater decentralisation. The production of energy creates no waste, byproducts of the processing of biomass could be naturally re-cycled. The amount of CO₂ in the atmosphere does not increase. Mostly these resources consume little or no energy in operation. Solar energy is the most accessible resource.

Disadvantages: today it is impossible to replace the energy consumed by using only renewable resources over a short space of time.

The expense of the extraction of energy from individual resources cannot be compared because not all the costs of producing energy from fossil fuels and uranium are calculated. Even in the need for land at the point of production it is difficult to compare one energy resource with another. Take for example the land a coal power station needs for its own building, subsidiary buildings, the area of mines, waste dumps, the area which it influences by emissions, etc. The distorted and unreal present prices of energy are generally accepted to be a brake on the development of alternative resources.

The existence of interest groups (lobbies), financially and politically interested in the preservation of the present state of affairs is a separate problem. It will be very difficult to persuade the voters and the politicians that the current tendency for the consumption of energy to increase by 2% per year is not really tenable.

The Estimates of the Potential for Individual Renewable Resources

Electricity

1. Hydro-electric engineering:

In the hydrologically adverse year 1990 in former Czechoslovakia 3,884 GWH were produced. It would now be possible to use about 800 to 1,000 MW of installed performance in small water power stations (SWPS).

The average annual production in 1989 - 1990	4,000 GWH
The estimate of the annual potential of SWPS	3,750 GWH
In total	7,750 GWH

2. Biomass:

The area of agricultural land in 1992 in the Czech Republic was 4.283,000 ha (Statistical year-book, 1993). According to B. Sarapatka it would be possible to use about 10% of this area for the growing of technical and energy plants. If 5% of the total area of agricultural land (214,150 ha) was used to grow energy plants and there was a yield of 10 to 20 tonnes from one hectare (and by burning one tonne of biomass it is possible to obtain about 1 MWh), then we would achieve a performance between 2.141,500 and 4.283,000 MW. This performance is derived from the comparison with the performance of lignite power stations, where according to the information of Czech Energy Plants one produced MWh equals the consumption of one tonne of lignite. We have not taken into consideration either the use of heat or other steps which increase efficiency. Nor has the possibility of the cogeneration of the gasification of wood been taken into consideration in the estimate. (So this is an underestimate, biomass has a higher

fuel efficiency than our lignite and it is possible to increase the energy use of power stations in a simple cycle).

3. Wind energy:

The data has been processed according to the technical data of wind power stations in Vítkovice. One wind power station V 315 is able to produce 500 MWh a year with an average wind speed of 3.5 m/s. If it were possible to install 2,000 of these plants, we would reach the level of 1,000 GWh/year. According to some studies, however, the potential of usable wind energy is even higher. Heinrich Böll Foundation estimates the potential at 1,500 to 4,000 GWh.

4. The potential to increase efficiency, savings and other resources:

a) By the introduction of technology for producing electricity in heating plants with a performance of 1,500 MW it is possible to gain about 2,850 GWh a year with 1,900 working hours. This calculation does not take into consideration a small cogeneration.

b) Losses in the network of the Czech Republic in the period 1991 to 1994 were 6.6% to 8.4% (from a report of Czech Energy Plants). Even this dispersion shows the possible savings to be made by a decrease in losses (e.g. by decentralisation, elimination of unpaid consumption etc.). The lowering of losses by 1% represents about 500 GWh of electricity. In the summary we consider a 2% decrease in heat loss (i.e. 1,000 GWh) attainable. (Considering the fact that we do not know of a study which has defined this issue, we notice that this is our own estimate.)

c) It is difficult to estimate the potential energy use of incinerators without an explicit plan concerning waste treatment. At least partly sorted out burnable waste is of very high fuel efficiency and today it is possible to reach very low values of single elements in emissions. We consider it suitable at least not to lose sight of this alternative.

In the following summary we will use data from the Centre for the Effective Use of Energy (SEVEN) in Prague. But in looking at potential savings we will take into consideration only savings which it would be possible to make in operations producing electricity at 0.90 crowns per kWh, i.e. 13.42 TWh. So the total potential saving is of course higher.

The source GWh

• water energy	7,750
• biomass energy	3,212
• wind energy	1,500
• the use of the potential of cogeneration	2,850
• a decrease in the loss in distribution network	1,500
• the energy use of incinerators	not calculated

• potential savings	13,420
• In total	30,232

Heat

1. The energy of solar radiation:

If the roofs of houses and nonresidential buildings and other surfaces suitable for the location of solar collectors are used, with 600 kWh per m² it is possible to obtain 42,000 GWh. (the data concerning usable surfaces is based on our own estimate which has not been verified by another source.)

2. Geothermal energy:

For the purpose of this study we did not manage to obtain information about the utilised heat potential of geothermal energy.

3. The energy of biogas:

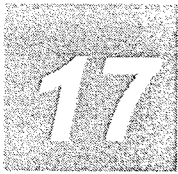
According to the project, which was worked out before 1989, it is possible to obtain 2.07 PJ energy in animal husbandry. This corresponds to 160.4 GWh per year (as stated by B. Sarapatka). A general study on the potential of biogas has not so far, according to our information, been worked out. We emphasise that, in the above-mentioned data, the possibilities of other resources are not calculated (sewage farms, dumps and households). We think that with the calculation of those possibilities the total potential would be many times greater than the above-mentioned figure.

4. Biomass:

Table No. 3 : The quantity of biomass according to its origin (according to V. Sladký, 1989)

Resource Location	Extraction (mill m ³ /year)	The estimation for energy purpose (mill.m ³ /year)
forests	20	2
recultivation, parks pruning, discharge chutes	1.5	0.75
industrial waste, packaging, demolition	2	0.25
In total	23.5	3

It is necessary to include 1.5 mill. m³ of wood for fuel (fuel allowance, goods for coal stores and private production) and we get the value of 4.5 mill. m³ of wood material for energy purposes.



If we consider the average weight of 1 m³ of wood to be 500 kg (poplar 400, spruce 430, willow 500, birch 585, oak 630, beech 650, hornbeam 680, locus-tree 700), 25% humidity and a fuel efficiency of 3.8 kWh/kg, we get the value 8.55 TWh. Considering the fact that this data is valid for former Czechoslovakia, we can roughly expect two thirds of this potential, i.e. 5.7 TWh.

5. The potential to increase efficiency and savings:

According to available information, the study quantifying the potential savings in heating as is presented here for electricity is not obtainable in our country. To illustrate this point we could use the comparison of the energy demands of heating surfaces in our country and in Denmark which shows that our efficiency is 30% worse.

Recapitulation - heat:

Source GWh

solar energy	42,000	
geothermal energy		not calculated
biogas energy	160	
biomass energy		5,700
increase in effectiveness and savings		not calculated
In total	47,800	

The Scenario of Sustainable Development

In 25 years in the energy industry it would be possible to reach a state which could be considered sustainable. This period is long enough to gradually change the sources of our electricity supply. It will be necessary to take into consideration several vaguely defined phases - the creation of new legislation, changes in price, the use of more high-grade fuels from the category of non-renewable resources, especially natural gas, in the period of transformation. Also the demand for and the consequent development and spread of new technology will take a certain time. The possibilities, that could lead to a desirable result, are represented above all by savings and by covering consumption from the renewable resources.

Price

Where price is concerned, it is desirable to include the damage caused by the production of energy, including the damage caused by the energy industry (e.g. in the case of extraction it is inclusive of the costs connected with the recultivation of the landscape, profits lost because the landscape cannot be used for another purpose etc.). It is also necessary to include in the price future costs, which is a topical issue e.g. in a nuclear power station.

Not everything is possible to express financially but the suggested solutions greatly even out the balance in the competition between non-renewable and renewable resources.

IN 25 YEARS IN THE
ENERGY INDUSTRY IT
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COULD BE CONSIDERED
SUSTAINABLE



The tax system

It would be suitable to increasingly tax non-renewable resources and discriminate against carbon fuel from the tax point of view. Here too a certain sliding scale from lignite to high-grade fuels, e.g. natural gas, is possible.

In the production sphere it is desirable to tax income according to the proportion of profit and the consumption of energy. A similar model could be applied also for households with the proportion of consumption per person. Demonstrably economical technology and enterprise in savings should be given preferential tax treatment.

Customs duty measures, legislation and state interference

From the viewpoint of customs duty the import of energetically uneconomical technologies should be more expensive, and energy-saving technology and technology maximising the use of renewable resources should be duty free. The sale of energy abroad should not be supported.

Small producers should be allowed to use the distribution networks of other firms and to sell energy. A requirement to combine the production of heat and electricity should be put into law. It is desirable to enable and support enterprise in savings.

It is necessary to provide state guarantees for the credits for enterprise in the field of renewable resources and energy-saving technologies, to support research in the same field (it would be interesting to compare research expenses in the nuclear power industry with expenses in the field of renewable resources and savings) and to create conditions for providing long-term credits. The price of energy should be gradually freed and decentralisation trends preferred.

The deliberate cutting back of non-energy-saving production (and the resulting unemployment, regional problems, migration, the need for mass requalification etc.) is a risk, while on the contrary the increased diversification of sources of energy is an advantage.

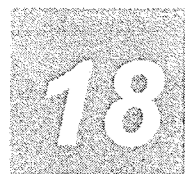
With the introduction of the inclusion of all expenses there could be such a shift to the benefit of renewable resources and savings, that the application of other economic measures would possibly not be necessary. It is possible to expect the same in the case of legislative support for the competitiveness of small producers of energy. But in any case, the use of more of the above-mentioned possibilities means much higher motivation both for the use of renewable resources and for savings.

Agriculture production would be more orientated towards energy crops. It would be possible to unify agricultural production (and forestry production) with the production of energy in one place - the answer would be energy farms.

In conclusion we would like to stress the considerable influence of the policy of power stations on other branches. In particular, any movement in price will influence the costs of all branches including the cost to the inhabitants, the price of energy to a great extent determines the structure of industry, the use of renewable resources, the price of products etc.

IT IS DESIRABLE TO TAX
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THE PROPORTION OF
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CONSUMPTION OF
ENERGY

THE PRICE OF ENERGY
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Industry

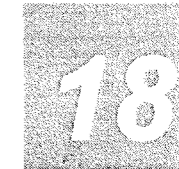
Industry plays a key role in the economy of the Czech Republic. It was a branch whose development in the past was marked by the military-political and economic aims of the communist block, which came before the needs and interests of former Czechoslovakia.

Czechoslovakia, especially Bohemia and Moravia, entered post-war restoration with very good conditions - a developed heavy and especially processing industry. However the natural development of industry was interrupted in 1948. The total nationalisation of all industrial enterprises took place and the model of a centrally planned economy started to be used. Because Czechoslovakia had the most developed industrial potential in the socialist camp, it was predestined to ensure the development of other countries of this block (it became "the smithy of socialism"). The demand for the quick growth and development of other socialist countries led to the development of heavy industry and the machine-tool industry in the Czech Republic. Also the development of the system of power stations and metallurgy adjusted to it. It happened at the expense of the development of the consumer-goods industry, which soon adjusted to the lower demands of socialist countries with the quality of its production.

Industrialisation was in progress intensively from 1948 to 1978 when it reached its peak. In the majority of important industrial branches it brought an enormous growth in capacity and production (e.g. the production of electricity from 1937 to 1978 increased from 4.1 billion kWh to about 70 billion kWh; the extraction of lignite from 17.9 mill. tonnes to 92.5 mill. tonnes; of steel from 2.7 mill. tonnes to 15.3 mill. tonnes; the production of plastic materials increased from zero to nearly 1 mill. tonnes). The physical growth of the production of heavy industry was nearly ten times greater.

By the end of the 1970's, the one-sided orientation towards heavy industry had reached its ceiling, due to the limited possibilities of the import of raw materials and fuels. At the end of the 1970's and the beginning of the 1980's, the world economy was characterised by a new model of growth based on innovation. The model of growth, based on an unlimited supply of cheap energy and raw materials, was abandoned. The purpose-orientated development of sciences and research, especially in microelectronics, robotics, automation, information technology, biotechnology, new materials etc., began to be applied. The transformation to a qualitatively new technology also changed the demands on the ecological parameters of shops and products in a revolutionary way. The demand for energy, raw materials and other materials decreased considerably, as did partly the demands for transport.

Our country began to lag behind the times. Uneconomic production methods continued to apply. In the period 1979 to 1987, the average annual increase in national income was about 2.1%, used national income only 1.3% (if we excluded fluctuations in prices the used national income would be slightly below zero). During these nine years the consumption of primary resources of energy increased by 8.7%, the production of steel increased from 14.8 mill. tonnes to 15.4 mill. tonnes and the production of plastics increased from 852.7 thousands tonnes to 11,151.7 thousand tonnes.



The quantitative development of industrial production and the one-sided orientation towards the countries of COMECON lay behind post-revolutionary economic problems. The level of production was immoderate, but quality was low (especially in metallurgy, the heavy and general machine-tool industries, the chemical and petro-chemical industries and electrical engineering). Outmoded basic means, especially machinery and technological equipment and an immoderate proportion of buildings and constructions, increased the expense and inefficiency of production. At the beginning of the 1990's, heavy industry absorbed half or even more of the resources of production of industry as a whole - i.e. investment, energy and imports. The more progressive branches (e.g. polygraphy, precision engineering and light chemistry) are insufficiently represented in international comparison.

The Czech Republic has one of the biggest conventional industrial potentials per person in the world at its disposal. However the negative side of this potential is that it is out-of-date and it has a lop-sided structure and low efficiency (the level of the productivity of labour in our country was, in the beginning of the 1990's, about 60 - 70% of the average of European countries and about 40% of the U.S. average).

A high demand for materials and energy was characteristic. The social product was considerable, but a large part of it was used in production. To sustain operations the production sphere "consumed" nearly 2/3 of all material production, while in the developed countries it is only 40 to 45%. Our energy and material demands per unit of gross domestic production in comparison with the comparable countries (Austria, Holland, Finland) was, at the beginning of the 1990's, 1.6 times higher in the consumption of primary energy, 2.6 times higher in raw steel and 1.8 times higher in cement. The energy demands of the creation of national income is 1.8 times higher.

Metallurgy, which is the basis of heavy industry, is the most overloaded branch of our national economy. Metallurgy, together with the petro-chemical industry, least efficiently uses the energy consumed when exporting. The profitability of the export of the products of heavy industry would be hardly midway up the table of shown coefficients if the total (today underestimated) costs of extraction and ecological damage were included. A high proportion of the production and export of products with a low level of processing is not tenable in the long term, even from the viewpoint of a poor raw material basis. The total annual production of industrial waste in the Czech Republic is about 13.5 mill. tonnes. The contamination of geological formations and the environment of rock by toxic waste is the basic problem of industrial waste, apart from simply its huge volume. The prices of secondary raw materials are very low, or even zero, so they do not stimulate the producers of waste to use or sell them. Relatively low prices of primary resources and negligible prices of secondary raw materials are a brake on the development of low-waste and recycling technology.

Monopoly was also a characteristic of Czech and Slovak industry in the recent past. The average size of an industrial enterprise was about 1,700 employees in our country in 1989, while around the world it is only 100 to 200 employees.

AT THE BEGINNING OF THE 1990'S, HEAVY INDUSTRY ABSORBED HALF OR EVEN MORE OF THE RESOURCES OF PRODUCTION OF INDUSTRY AS A WHOLE - I.E. INVESTMENT, ENERGY AND IMPORTS

TO SUSTAIN OPERATIONS THE PRODUCTION SPHERE "CONSUMED" NEARLY 2/3 OF ALL MATERIAL PRODUCTION, WHILE IN THE DEVELOPED COUNTRIES IT IS ONLY 40 TO 45%.

In the Czech Republic there are the following main industrial areas: Cheb-Chomutov (the fuel and energy industries), Plzen (the machine-tool industry), Chomutov-Ústí nad Labem (the chemical, fuel and energy industries), Prague, Liberec (the glass and textile industries), Pardubice-Hradec Králové (the machine-tool and chemical industries), Náchod (the textile industry), Brno (the machine-tool industry), Olomouc (the machine-tool industry), Zlín (the machine-tool and chemical industries), and Ostrava (metallurgy).

Two thirds of basic means, production areas and the production of the Czech Republic are concentrated in these regions. The Ostrava region (20% of basic production means and 20% of production), the Prague region (9% and 12%), the Chomutov-Ústí region (12% and 8%) and the Brno region are the biggest ones. 96% of the production of fuel, 94% of iron and steel metallurgy, 86% of the energy industry, 74% of the polygraphic industry and 71% of chemical production are concentrated in the above-mentioned 11 main areas.

The restructuring of industry will be crucial for its further development (together with privatisation). The cutting-back programmes will affect above all extraction and the metallurgical, heavy machine-tool and heavy chemical industries. The state should carry out these cutting-back programmes, because it is not possible to presume, that private capital will invest in unprofitable productions and ones with poor prospects. The production of equipment for the improvement of the environment (the so-called ecological machine-tool industry), equipment for saving energy and for the use of alternative sources of energy, the machine-tool industry and consumer-goods industry orientated towards developed markets and pharmaceutical production may have good prospects.

World trends (the growth of electrical engineering, special chemical production etc.), historical development, the appropriate raw material base and geographical location will all be important in forming the future structure of industry. Also the ecological parameters of production and products will have a greater and greater role upon the world stage.

For the ecological parameters of production it is necessary to consider:

- the raw material and energy demands of production;
- the pollution of the environment by pollutants, noise, waste heat, electromagnetic and ionizing radiation;
- the level of health risk connected with production;
- the amount of waste and its toxicity, the possibility of the further processing of waste or its destruction;
- the level of the risk of an accident.

The Prospects of Industrial Development

The quick privatisation, which defines ownership relations, is of great importance for the further development of industry (besides financial and political stability).

In the present liberal understanding of economics dynamic changes are taking place in industry. Unprofitable enterprises are becoming and will become inoperative, on the other hand new enterprises are appearing.

In connection with the transformation of our economy and the recent break-up of the markets of former COMECON, a great drop in industrial production has occurred in the past couple of years. Compared with 1985 (=100%), industrial production in the Czech Republic in 1993 fell to 67.8%. These factors were intensified by the opening up of the economies of the East to the states of the West. Our ineffective, over-loaded industry with a lop-sided structure was not able to face more advanced competition. Both heavy industry and the processing industry were affected. The branches orientated towards domestic demand went through the transformation relatively successfully. The emphasis changed from the production of goods demanding capital to the production of consumer goods.

The fall in industrial production also caused a loss of jobs. This pool of redundant labour from big enterprises, however, was successfully absorbed by the previously undervalued sphere of services and newly opened smaller industrial enterprises.

As early as 1991, the preservation of the vitality of our industry called for protection in the form of devaluation and in this way for the possibility for industry to orientate itself towards developed markets. The success of the Czech economy in increasing exports to the West, and in this way also the preservation of industrial production and jobs, relied above all on the low exchange rate of the crown. But the position of the Czech Republic on the world market is more that of a supplier of components than a producer of finished products. Also a great proportion of export is represented by primary production, which is the biggest pollutor of the environment. It contributes a great deal to the consumption of energy and the level of toxic waste. As an example it is possible to mention the growth in the production and export of cement. Also many enterprises processing lime have been sold to foreign firms. The development of cement works calls for a corresponding development of the energy industry, which again creates a need for fuels with high demands on capital. The fuel industry to a great extent devastates the environment of our republic. The alarming growth of the extraction and export of raw materials has been reported also with raw materials other than fuel.

It is necessary for the Czech economy to become involved in the world economy, which helps further specialisation on the international level. This specialisation will lead to the end of Czech industries and enterprises that are not able to compete on the world market (e.g. the electrical consumer goods industry). On the other hand, branch offices of foreign firms, or firms with foreign investment, will come into existence in our country.

An influx of foreign capital is necessary for our republic because of the lack of domestic capital. Political stability and a financially stable economy are basic factors which influence the influx of this investment. The foreign sector will form a large proportion of our industry in the future.

Industrial firms always operate within certain norms. Therefore it is necessary for our state to have good legislation above all in the protection of the environment that will prevent the transfer of harmful production to our country.

In connection with the increased competitiveness of our products and with a rise in the exchange rate of the crown we should shift towards the production of products with a higher level of processing. Enterprises dealing with primary production will not be able to compete with cheaper competition, above all from the East. This will

lead to great social problems in areas with a high proportion of primary production, in e.g. the Ostrava region.

This development could shift the structure of our industry to the situation which obtained in the developed countries. In connection with global trends the importance of special chemical production and biotechnology could increase in industry. However, for the Czech Republic above all traditional branches, such as the machine-tool or glass industries, will continue to be important.

Today more and more industrial enterprises in the industrially developed countries are trying to rid themselves of the stigma of being the main culprits behind environmental problems. The ecological characteristics of products are some of the main criteria of quality and to a greater and greater extent they determine their competitiveness on the global market. At the same time the thing is not only that products should not be e.g. toxic, but also whether it is possible to recycle them or at least easily dispose of them. It is possible to expect this development in the near future even in our country.

The "greening" of Czech industry has a chance to be successful if there is intense and long-term pressure from the public. Producers will become responsible not only for their production and the functionality of the products, but also for their disposability. It means that products will be produced in such a way that they will be recyclable or biodegradable or disposable in another way similar to the processes in nature.

Transport

Transport, together with telecommunications, is necessary for society to function. The importance of transport from an international point of view is intensified by the geographical location of the Czech Republic. We can become a part of the East-West trade route (above all between Germany and the countries of the former Soviet Union and China, and the Berlin - Vienna route), in the North - South direction we again have a geographically important location (Vienna - Warsaw).

We can divide transport into road transport, railways, ship transport, air transport and pipelines. If the importance of transport in the Czech Republic is supposed to correspond to its geographical location, great investment and modernisation of all types of transport will be necessary.

Railways

In 1993, the railways transported 97.0 mill. tonnes of goods (in 1989 it was 170.9 mill tonnes) and 242 mill. passengers (in 1989 it was 290 mill. passengers, in 1980 278 mill. passengers). This means that there has been an important decline in the performance of the railways and a decline in their importance, which it is possible to evaluate as a negative trend from the viewpoint of the environment (transport has shifted to the roads). The quality of transport, especially of passenger transport, is

insufficient. In the last century the speed of express trains was the same (on some railway lines, which are now overloaded, even quicker), as it is today.

For ecological reasons railway transport could and should become the backbone of our transport system. Above all the level of railways and a willingness to start building high-speed lines (about 120 km/h for goods transport, 140 to 160 km/h for express trains) will determine whether the East-West main line will go through our country or whether it will go the northern route through Poland or the southern route through Austria and Hungary.

It would be interesting to weigh the possibility of using two resources in modernising the railway - the labour strength of part of our army (and also unemployed people in the form of work beneficial to the public) and foreign (above all German) capital.

Road Transport

Almost exclusively, the Czechoslovak Bus and Road Haulage Company (CzBRHC) and factory bus transport used to ensure the mass road transport of goods and passengers. Today there are also a great number of private transport companies.

In 1993 CzBRHC transported on the roads 37.1 mill tonnes of goods. (In 1989 it was 223.5 mill. tonnes, however at that time factory transport carried nearly three times more goods than CzBRHC. More than half of the transported tonnage was building material.) In 1993 CzBRHC transported 986 mill. passengers, in 1989 it was 1,376 mill. passengers. So we can speak of a downward trend in the use of public transport by passengers (and a resulting shift to car transport). In 1993 in the Czech Republic there were 2,693 thousand cars, 53 thousand delivery vans, 147 thousand trucks, 129 thousand special trucks, 24 thousand buses and 451 thousand motorcycles on the roads (in 1989 it was 2,286 thousand cars, 45 thousand delivery vans, 152 thousand trucks, 108 thousand special trucks, 25 thousand buses and 444 thousand motorcycles).

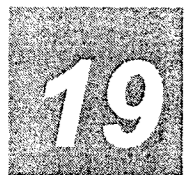
In urban public transport in 1993, 2,635,253 thousand passengers were transported (this includes 846,279 thousand passengers by tram, 239,158 thousand passengers by trolleybus, 995,149 thousand passengers by bus and 554,867 thousand passengers by tube). In 1990 in total 2,591,363 thousand passengers were transported.

In 1993 there were 152 thousand accidents, in which 1,355 people were killed, 5,629 seriously injured and 26,821 sustained slight injuries. The damage was 2,988 mill. crowns. This trend is alarming, especially if we compare it with the situation in 1989. In that year in the Czech Republic there were 79 thousand accidents, in the whole of former Czechoslovakia it was 110 thousand accidents. In the Czech Republic 914 people were killed in these accidents, in Czechoslovakia 1,397 people, in the Czech Republic 3,998 people were seriously injured, in Czechoslovakia 6,141 people, in the Czech Republic 20,437 people were slightly injured, in Czechoslovakia 27,860 people. The damage caused by the accidents in the Czech Republic was 423 mill. crowns, in Czechoslovakia 575 mill. crowns.



FOR ECOLOGICAL
REASONS RAILWAY
TRANSPORT COULD AND
SHOULD BECOME THE
BACKBONE OF OUR
TRANSPORT SYSTEM

THE "GREENING" OF
CZECH INDUSTRY HAS A
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INTENSE AND LONG-TERM
PRESSURE FROM THE
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Today the road network in the Czech Republic is fully used and is not suitable for a higher intensity, especially as far as foreign lorry transport is concerned (in Switzerland and Austria this problem has been solved by the transport of transit lorries on the railways). In our country there are 390 km of motorway (in 1989 it was 336 km) and in the past they were constructed at the rate of about 15 km of new motorway per year, which is an unbearably slow rate of increase. The construction of a basic network of motorways (into former regional capitals) is presumed. The fees for transit for foreign lorries should be increased and their transport on the railways should be given preferential treatment. Also the possibility of collecting fees on the motorways according to the number of kilometres covered (as in some other countries of Europe) should be taken into consideration and not an all-inclusive annual fee. In this way the construction and operation of motorways would be paid for mainly by those who use them.

The above-mentioned measures, together with foreign investment (mainly in the sphere of services, such as filling stations, accommodation and eating facilities etc.) should be an impulse for the modernisation of the road network which should be a "helping hand" to railways (railways should bear the main load, above all in the carriage of freight).

For ecological reasons urban public transport should be financed and intensified (even if pollution from trams, trolleybuses and the underground does not disappear, but is only shifted to the places of electricity production) and it could be established in towns with more than 15 thousand inhabitants. Also bus and railway passenger transport must be given sufficient preferential treatment in comparison with car transport. It should be enough to include the full costs of car transport, including a tax for damaging the environment and a tax for using a non-renewable resource. It will be non-ecological and unethical towards nature, if a car transporting only one passenger becomes a symbol of personal "freedom" and consumption in our country, as it did in the western countries.

Paths for cyclists should be supported and extended, not only for ecological and economic but also health reasons. Hradec Králové in the Czech Republic or hundreds of towns in Germany or Holland are evidence of their suitability.

The support and development of auto-rental offices is another great opportunity. From the ecological point of view today, an owner who annually covers less than about 8,000 km would save money if he rented a car. For many people it would be an acceptable compromise between the comfort which is provided by a car, and the financial demands and ecological needs that are against the buying of a car. However, a precondition is a sufficiently widespread and high-quality network of auto-rental offices which should be subsidised at least at the beginning.

Air Transport

In 1993 in our country 27,677 tonnes of goods were transported by air (of which only 291 tonnes were transported internally) and 1,358 thousand passengers (of which 137 thousand passengers were internal) and 32,740 thousand km were flown (of which 2,650 thousand km were flown internally).

Many international airlines avoid Prague because of our airport's out-of-date equipment. However, the decline in internal flights is even more remarkable. In former Czechoslovakia, e.g. in 1980, three times more people were transported on internal routes than in 1989. In 1980 aerotaxi was still being used but later it was abolished. The idea of the businessman Bata could again be investigated: we have no sea, our ocean is the atmosphere, this is how we must get into the world.

With the development of enterprise in the Czech Republic there may be a growth of interest in the restoration and development of light air transport with the very quick transport of a small number of people (aerotaxi). The question of the construction of a modern international airport in the Czech Republic is still open.

River Transport

Although the Czech Republic and Slovakia are states without direct access to the sea, in 1989 we jointly owned 20 sea-going ships with a total gross carrying capacity of 263,653 tonnes, in 1993 it was 18 ships with a total gross carrying capacity of 320,041 tonnes. With the help of river transport in the Czech Republic, in 1989 7,906 thousand tonnes of goods were transported, in 1993 it was only 4,906 tonnes of goods.

The future of river transport would be essentially influenced by an alternative (ecologically highly unsuitable) completion of the Danube-Oder-Elbe canal. Plans to connect the Black Sea with the North Sea and the Baltic Sea have been mooted for a century. Recently, the competing Rhine-Main-Danube canal was completed. It is probable that if the Danube-Oder-Elbe canal were completed it would not be used by the majority of European countries and an expensive construction would lose its purpose. Another danger is that Poland would possibly not join in on the construction and then it would be "an impasse". The Danube-Oder-Elbe canal has many unfavourable parameters in comparison with the rival Rhine-Main-Danube canal: it is three times longer overall, 2.5 times as much height must be gained, three times as many locks will be necessary.

From the technical point of view it might be a perfectly designed work, but its usefulness is extremely questionable. The Danube-Oder-Elbe canal would have the capacity of a one-line railway track and energy demands would be approximately the same as diesel transport on the railways.

The completion of the Danube-Oder-Elbe canal would bring many ecological problems and it would intensify the possibility of the further development of our heavy industry with high raw material, energy and transport demands, which would again negatively influence the quality of the environment.

However the cardinal question of the suitability or unsuitability of the canal and other similar technological projects may be in the end somewhere else - in the value orientations which our society wants to choose: in the long-term perspective, even considering that the work would be technologically perfect, an artificial landscape will be formed. Do we want to adjust the river and surrounding countryside to the needs of man, or should the needs of man be adjusted to the environment which surrounds him? Do we want in the end to restructure the

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landscape into one big artificial park and garden, or will we give preference to the limited use of our environment so that the natural character of ecosystems will be preserved?

Pipelines

In 1993 5,610 thousand tonnes of crude oil were pumped from Russia to our country through oil pipelines and in the same year 6,983 thousand tonnes of natural gas were pumped from Russia through gas pipelines.

However it is very disadvantageous and risky if we depend nearly exclusively on one supplier. The transformation to convertible currency in financial relationships with Russia, the break-up of eastern markets, unreliability and political instability in the countries of the former Soviet Union, but also the war in the Persian gulf brought us to the point of an energy crisis five years ago. Therefore today a connection with western-European sources (the construction of the oil pipeline from Ingolstadt in Germany) is being completed. In this respect it is possible to remember the wise saying that "nature never puts all its eggs into one basket".

Urban Public Transport

In the Czech Republic there are trams in seven towns, trolleybuses in twelve towns and buses in bigger towns (approximately upwards of 20,000 inhabitants). The only subway system is in Prague.

Urban transport by tram or trolleybus operates in seventeen towns of the Czech Republic (six of which are in Moravia).

In total in 1993 trams transported 846,279 thousand passengers, trolleybuses 239,058 thousand and in 1995 the subway system in Prague transported 554,867 thousand. In the last couple of years the development of urban public transport has stagnated. Due to the fare rise and the stagnation or worsening of the quality of services and due to the present tendency to adopt a western way of life (and the resulting preference for cars) a substantial increase in the load on the environment by cars in towns is probable. This causes many other indirect investments - the construction of parking lots, the extension of road lanes, investments in the protection of the atmosphere, anti-noise safeguards etc.

Telecommunications

Telecommunications, radiocommunications and the mail service are closely connected. We will concentrate first of all on telecommunications, because it is a key sector for the functioning of society and creating the preconditions for its development.

In 1980 in the Czech Republic there were 3,507 post offices, in 1989 3,523 and in 1993 3,506 post offices. The number of telephone subscriber stations in 1980 was 2,286 thousand (1,178 thousand main stations, 1,108 thousand secondary), in 1989 2,932 thousand subscriber stations (1,557 thousand main, 1,374 thousand secondary) and in 1993 3,349 thousand subscriber stations (1,961 main and 1,388 secondary).

In 1980 in the Czech Republic there were 67 radio transmitters and 45 television transmitters. In 1989 it was 92 radio transmitters and 63 television transmitters, in 1993 we had 177 radio transmitters and 92 television transmitters. In 1980 there were 3.4 licensees per radio transmitter, in 1988 3.3 licensees and in 1993 3.8 licensees. In 1980 there were 3.3 licensees per television transmitter, in 1989 3.1 and in 1993 3.2 licensees.

The number of post offices in the course of the last fifteen years has remained the same, which does not matter because there are enough. In 1989 there were 2,941 inhabitants per post office (in 1993 2,942 inhabitants).

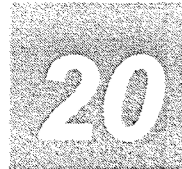
The situation is different with the telephone. In 1990 there were 292 subscriber stations per 1,000 inhabitants, in 1993 then 324 subscriber stations. In many places the outmoded and overworked equipment of telephone exchanges (though recently the situation has been improving, above all in towns) is a big problem. In 1990 in the Czech Republic there were 14,742 public telephone booths. The number of pending applications for the installation of a telephone was 270,841 in 1989, in 1990 309,519 and in 1993 as many as 572,752. This increase in pending applications is closely connected with the development of business activity.

In the course of the last decade the number of telegrams sent has continually declined. This trend will continue thanks to other means of quick communication, such as e.g. fax, e-mail etc.

The number of phone calls in this period has increased. In the period 1989 to 1993 there were more than 70% more calls and this trend is continuing. It is connected both with the above-mentioned business activity and the quick development and the revival of international connections. However, the telephone network is neglected, because profits were not invested into its modernisation in the past. The present-day privatisation and the participation of a foreign partner (and investor) in our telecommunications, however should improve it.

Telecommunications are a key area for society to function and develop. Nothing will function satisfactorily without them in the period of transformation from the industrial era to the postindustrial era. Today we are paying for out-dated and unreliable telecommunications in the development of enterprise, in attracting quality foreign investment, in the development of tourism etc.

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So today the development of this area is very important and has great potential for us.

Around the world, telecommunications and the entertainment industry are two of the areas, where the economic decline has not been reflected. On the contrary, trade in telecommunications equipment in 1990 reached \$95 billion and by the end of the decade is expected to double.

Trade in systems for the distant processing of data is developing in a most progressive way (100% increase per year). Trade in telephone exchanges shows 7.5% growth per year. In the countries of the European Union the annual income for providing telephone services is about \$75 billions with an annual growth of 4%. However, this figure will probably increase to 7% in the near future.

In the last few decades the developed countries have invested great sums of money in the development of telecommunications. The range of services, however, has been considerably enriched thanks to investment (and thanks to enormous scientific-technological progress in this field).

In many countries telecommunications were separated from postal services and privatised (U.S.A., Great Britain). However sometimes the state keeps this branch as a state monopoly above all in the opening phases of vast modernisation. France, which had also a neglected telecommunications network at the beginning of the 1970's as we have now, is an example. Thanks to political decisions, France Telecom could borrow capital, consult experts and choose technology.

Gradually 200 billions francs were invested in modernisation and over 15 years the level of French telecommunications has reached or even slightly overtaken the level of other western-European countries. The important condition was that telecommunications are a public service and telephone lines had to be available across the whole of France under the same conditions (there was a danger that companies would concentrate on big towns with many telephone lines and with a higher profit, and this danger may also appear in our country).

As far as a telephone network is concerned, it is necessary first to build modern digital exchanges and to prepare a fully automated telephone network. This will allow a sufficient increase in the number of telephone lines. Although not long ago there were 100 inhabitants per 11 telephone lines in former Czechoslovakia, in the countries of the European Union it was 43 telephones. It is estimated that we would need to invest about 100 billion crowns in telecommunications to the year 2000 to reach the western-European level of 1991.

The construction of a telephone network which approaches the level of western-European countries will open up many opportunities which telecommunications offer when entering the post-industrial era. This will mean not only the use of a classical telephone. The use of mobile phones is strongly developing. Other things, which have been known to us and popular for six years, are faxes and answer-phones. Various computer data networks connected with the telephone are another achievement. In this way it is possible to transmit whole sets of data instantaneously all over the planet, and very cheaply (this will soon become a rival not only for the classical postal service, but also partly for passenger transport). Public data networks can be used by various institutions, above all they are used by banks and financial institutions around the world.



E-mail is relatively a new thing even in western countries. In our country it has been introduced in higher education institutions but it is spreading also to other institutions. Through the computers and in this way through the modem it is possible to send information by telephone or on the contrary it is possible to obtain this information e.g. from various databases.

Experiments are being carried out with a videophone that transfers not only sound but also a picture. It is possible to use it when holding videoconferences, work meetings, scientific or political proceedings etc., without the necessity for participants to leave their offices or homes.

Videotext is an example of a public data network that opens up dozens or even hundreds of databases through the terminal screen. With the connection to the world network Minitel-Net it is possible to use nearly 2,000 different services (booking tickets, information about the weather, shopping etc.). In France this service is now used by seven million owners, i.e. about 30% of the population.

Examples of other possibilities of using telecommunications services that will influence our way of life: greater opportunity to work at home, greater freedom to choose certain professions without considering where you live, and in this way also the intensification of decentralisation trends in settlement, the limitation of passenger transport (including air transport) etc.

So telecommunications are really an area with great potential and a necessary precondition for the development of society. If we consider only the intensity of international telephone connections, then in the countries of the European Union there are 38% of all international calls. The inhabitants of the U.S.A. in 1992 telephoned more than six billion minutes. The list of the most frequent international phone connections is also interesting: 1. U.S.A. - Canada (3.3 billion minutes); 2. U.S.A. - Mexico (1.5 bill. minutes); 3. U.S.A. - Great Britain; 4. U.S.A. - Germany; 5. China - Hong-Kong (!). Then European calls follow: Switzerland - Germany; Austria - Germany; Germany - Great Britain; Germany - France.

It seems that it is possible to manage an enormous growth in the demands on the use of the telephone even in future and our possibilities (from the technological point of view) seem to be nearly limitless. The reason is the use of the new technology of optical fibres. One single-core cable with optical fibre can handle over 8,000 calls at the same time, the old-fashioned copper wire has a capacity of 48 calls. The production of optical fibre is less demanding on energy and raw materials (in comparison with copper wire) but it calls for more skilled work.

In 1988 the first cable with optical fibre that can handle 40,000 calls at the same time (by which it triples the efficiency of the old copper cables and satellites) was laid between America and Europe. The second transatlantic cable with optical fibre can already send 80,000 calls at the same time. Before 1992 25 million kilometres of cable with optical fibre were laid (Naisbitt, Aburden, 1992). In this way a uniform world information network is being quickly created.

It is possible to say that the branch of telecommunications (or the information industry) is today the most quickly developing branch with the best prospects. It needs huge investment. It is a branch which influences the development of all other branches of the national economy and it also influences the entry of society into the post-industrial (information) era. In this way the development of telecommunications

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is becoming indispensable also for the education system, upbringing and education generally.

21

Tourism and Recreation

The year 1888, when the Club of Czech tourists was founded, was very important for the organised development of tourism in the Czech Republic. In 1918 the Club was renamed the Club of Czechoslovak tourists and at that time it had 53 branches and 4,927 members. In 1933 there were already 385 branches and 111,440 members. The activity of the club of Czechoslovak tourists was very wide, from marking tourist paths (40,000 km before 1937) to the construction of observation towers, from the reconstruction of old castles to the construction of tourist cottages and homes.

After World War II the first basic change in the character of tourism occurred. Foreign tourism was reduced. In 1957 it was less than 15% in comparison with 1937.

A new phenomenon appeared - mass domestic tourism, run mostly through selective and factory trade union recreation.

The period from 1958 to 1989 is characterised by the monopoly of the state and state organisations in tourism.

Bound Tourism

In the 1980's they tried to build big multi-purpose buildings and to use them maximally, which was the biggest problem with the buildings of factory recreation, where the utilisation of bed capacity was only 22% of the nationwide average in 1981.

Unbound Tourism

Participation in unrestricted tourism was increasing in former Czechoslovakia (1957 - 4.9 million participants; 1967 - 5.9 million participants; 1982 - 12.4 million participants). In 1989 in former Czechoslovakia there were about 2,100 places with unrestricted accommodation for tourism and recreation.

This dense network is to a certain extent concentrated. Natural conditions and the structure of settlement are the most important here. A substantial part of the accommodation capacity (about 65%) is concentrated in main recreational areas in the mountains (the Krkonose, Jeseníky, Sumava and Beskydy mountains) and next to recreational reservoirs (Lipno and Orlice dams). There is also a higher concentration of accommodation opportunities in towns, above all in spas.

21

Individual Cottage Recreation

Former Czechoslovakia (and above all Bohemia and Moravia) was one of the countries where cottage recreation (so-called second homes) was of great importance, which was reflected both in the structure of domestic tourism and its volume and in the structure of recreational accommodation capacity.

In the 1960's there was a boom in domestic tourism and recreation, which was reflected also in the construction of individual recreational buildings.

In the 1970's and 1980's there was a boom in individual cottage recreation. In the whole of Czechoslovakia in the period 1970 to 1981 the number of recreational buildings increased by more than 140 to 150 thousand. From the viewpoint of regions, most of these buildings were built in towns in Southern and Western Bohemia. In this period cottages were no longer built around Prague and they increasingly appeared in surrounding regions.

Foreign Tourism

Our country has always been attractive for foreign tourists and there are very good preconditions for the development of foreign tourism.

In 1989 Czechoslovakia earned \$160 million from tourism. In 1990 it was \$316 million and in 1991 as much as \$825.4 million. Even after the separation of Czechoslovakia this trend is increasing in both successor states. But in 1989 Austria earned \$9.3 billion, Belgium \$3.1 billion and Denmark \$2.3 billion in tourism.

After the revolution in our country the shortage of accommodation and eating facilities, mainly in attractive places, was a problem. This is quickly changing, however the quality of services provided (for exorbitant prices) and the length of time foreign visitors stay (they come here only for 3 or 4 days on average) are still a big problem.

The consequences of denationalisation and the development of private enterprise were quickly reflected in tourism. The enterprise of travel agencies, the number of which in 1992 was more than 4,000 (the data for Czechoslovakia), is developing. The number of border crossings has considerably increased.

The political stability of our state is important for foreign tourism. The lengthening of holidays in western-european countries, which should extend to 7 or 8 weeks during the 1990's, will affect its development. From the western-european countries, the people from our neighbouring countries - Germany and Austria - will visit our country most. From the former countries of the Eastern block it will be above all Slovakia and also tourists from Poland and Hungary.

Only five regions in the Czech Republic are now considered attractive for foreign tourism:

- *the capital Prague*. It is a unique cultural and architectural jewel, an important social and in the future also trade, scientific and cultural centre of Europe.

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- *the area of western Bohemia spas* (Karlovy Vary, Mariánské Lázně, Kynzvárt, Frantiskovy Lázně, Jáchymov and Kyselka). It is a much-frequented area with a concentration of medical and mineral springs.
- *the South-Bohemia basin*. The region with a high concentration of architectural monuments, lakes, ponds and streams with many opportunities for recreation.
- *the area of the Sumava mountains*. The mountain massif, where the Czech Republic, together with Germany and Austria, cooperates in the development of tourism.
- *the Krkonose mountains*. The mountain massif with the oldest Czech national park which, however, is one of the most endangered national parks in the world. The reasons are emissions and strong recreational pressure.

The Czech Republic has many other attractive areas (such as e.g. the Moravian Karst, the Orlíky, Jeseníky and Beskydy mountains, the Bohemian-Moravian Uplands), where tourism should be developed under control to support the development of these regions and at the same time to give the above-mentioned regions with many tourists relief.

Spas

The expected demographic development up to the year 2010 assumes a general ageing of the population which could mean a higher frequency of degenerative and chronic disease. Due to the problematic quality of the environment and way of life we can expect a higher occurrence of diseases of the circulatory system and respiratory organs, nervous and psychiatric disorders, allergies and other diseases of civilisation requiring spa treatment even in the future. The traditional structure of spa visitors will be increasingly supplemented by those interested in preventive and rehabilitative treatment resulting from people's awareness of their responsibility for their own health.

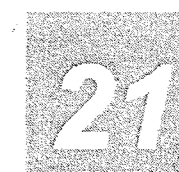
People from abroad are interested in traditional spa centres (Karlovy Vary, Mariánské Lázně, Frantiskovy Lázně)

Trade-Union and Factory Recreation

A total change in the structure is the most important aspect. There are no unified trade-unions any longer. Individual trade-unions and individual factories are and will be economically strong in different ways.

There is an obvious effort being made to use the recreational buildings in the course of the whole year and to increase the attractiveness of services provided.

Considering the possibilities of travelling abroad and the general economic situation, factory and trade-union recreation is experiencing a crisis. But in the end it is more logical for employers to give their employees some money for individual recreation so they themselves can decide when, where and with whom they want to go.



Tourism is one of the areas which will record a considerable increase and a dynamic growth in income, it will stabilise and initiate the effectiveness of associated areas, guarantee not only present but also create new work opportunities and especially in terms of future prospects there are preconditions for it to find its place on the world market. Around the world, tourism is already in first place, as far as contributing to economic performance is concerned.

But the situation is a little more complicated and the forms of tourism may change considerably. Hana Librová, in her book "Colourful and Green" (1994, in Czech), stated that among some groups of inhabitants (surgeons, teachers, lawyers, "better businessmen" and those who pretend to be) tourism in its present state is starting to be less popular. Study holidays, political tourism and expeditions are more attractive. These prestigious forms of travelling in some features approach so-called soft tourism, that aim at a new, socially and ecologically responsible attitude toward host areas. H. Librová says that the futurologist Robert Jungk is considered to be the father of the idea of new tourism. He characterised both types of tourism in the following way:

Hard tourism	Soft tourism
mass travelling	individual, family journeys, journeys with a small group of friends
not enough time	enough time
quick means of transport	adequate and slow means of transport
far away	near
firm programme	spontaneous decision according to the situation
controlled from outside (travel agency)	controlled from inside
imported way of life	way of life similar to that of a given country
"monuments"	experience
comfortably and passively	with effort and actively
little or no psychological preparation	preparation connected with a given country
without a knowledge of the language	with a knowledge of the language
the feeling of superiority	the pleasure of learning from local people
shopping	bringing presents for hosts
souvenirs	memories, new experience, drawings
brochures and post cards	paintings
curiosity	tact
noisy	silent

Agrotourism is another example of soft tourism. It is variant of summer holidays that was wide-spread in our country during the first republic. The active assistance of holiday-makers in seasonal work could be agrotourism as well.

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But it is necessary to mention that agrotourism may not be accepted everywhere with pleasure. Local citizens, mainly in the regions with a low rate of migration and a high percentage of permanent inhabitants, may be afraid of interference in their conventional way of life and they do not need to share that way of life temporarily with a stranger.

Hana Librova also says that agrotourism is, in some developing countries (e.g. in Senegal), similar to "village tourism". It is an attempt to make it possible for citizens from western countries to become familiar with areas while keeping a maximum number of the rules of soft tourism. Tourists live in modestly furnished houses not so far from a native village and they have the possibility of contacting its inhabitants especially through excursions to the schools, hospitals or churches.

"We can interpret", concludes H. Librova, "soft tourism as a result of the willingness of people to abandon the advantages of civilisation for the benefit of nature and the inhabitants in the host countries."

Economic System

Economics is a science that tries to discover and formulate laws with the help of which economic activity in society is controlled. Economics has developed during the very eventful and contradictory period of the human history of the last two hundred years. It has been a period of struggle between the progress of the modern era and the "obscurantism of the Middle Ages". We will try to explain what the problem is.

In the Middle Ages, man understood himself and the surrounding world as a reflection of God's majesty. He understood the world as an unfinished cathedral, which it was necessary to finish together. From this, meekness, the awareness of our own imperfection, the necessity to rely on God's grace resulted. The universalistic understanding of man was a part of this attitude. It is surprising but, for all its undemocratic character, differences between the Estates etc., they admitted that people were sent in to this world with a certain mission which they should understand and fulfill.

Modern man refused this understanding of the world. He chose a clearly anthropocentric understanding of man. He stopped considering himself God's servant and he started to consider himself the master of the world and nature. The world stopped being a duty for him and it became his property. Modern man founded sciences with the help of which he wanted to study nature and society as much as possible, he tried to master nature with the help of technology. Death and eternity were shifted back and consumer materialism stepped on stage. The history of salvation was replaced by progress.

The inconsistencies of the modern period are, in our opinion, that man managed to discover the limitations of the Middle Ages, to identify the inconsistency between philosophy and practice, to impart a motion to his abilities, but spiritually he became incredibly wild. He refused the universalistic understanding of man and replaced it either by a liberal attitude in a lower form or by nationalism.

The value orientation of modern man was accepted by the majority of scientific disciplines including economics. Besides undoubted progress, it led to the plundering of natural resources and to the impairment of the balance of nature. In economics it manifested itself in the shape of one-sided economic liberalism (we have in mind one-sided liberalism reduced to the level of egoism, not liberalism as such). Economics divided human life into economic and non-economic parts.

Economics realised its mistake as early as the first half of the 20th century.

Every conscious human activity has many aspects such as e.g. the moral, religious, aesthetic, legal, technical, political or economic points of view. If a human act is supposed to be praised, it must be right from all the points of view from which it is judged, or from which it can or should be judged. For instance: to find a new dress is a good act from the aesthetic point of view, but if somebody stole it, it would be a bad act from the legal point of view, if somebody found a very beautiful but very expensive dress and bought it to the detriment of necessary food, it would be an aesthetically and legally correct act, but uneconomical, i.e. an economically wrong act.

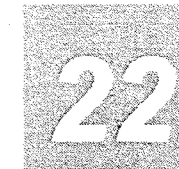
There is no barrier between the economic and non-economic sides of human life.

The economy presupposes a special way of evaluation. It consists in looking for a benefit from reaching a certain goal and the effort that must be expended in attaining it. A certain act is economically right, or economical, when the person who evaluates it acknowledges that the most favourable proportion between the benefit of the aim and the effort expended has been reached. An economic value judgement is as subjective as e.g. aesthetic, moral, political judgements.

This is the attitude of the main stream of economics - the neoclassical school.

Some economists emphasise that in the economy the thing is not a choice of purposes, because this is a matter of moral, aesthetical and other considerations. But in reality the problem of purpose in the economy is similar to that in aesthetics, politics etc. The thing is a difference between "the final purpose" and temporary purposes. The determination of "the final purpose" is a matter of philosophy and outlook (mostly identified with religion). E.g.: shall I buy a house or make a journey around the world, or give money to the charity campaign for the education of abandoned children? Everybody can see, that making a choice between first two "alternative ways of spending money" is somehow easier than between the first and third ways or the second and third ones. These are morally distant from each other, the first two are closer to each other. Between the first two, the economic point of view is more likely to be applied, between the third and the other two more a moral point of view.

The crisis of the present world does not lie in the wrong interpretation of this or that economic means, but in man surviving the disintegration of basic values when looking at himself and the surrounding world.



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22

THE INFLUENCE ON THE ENVIRONMENT IS AN IMPORTANT UNPLANNED EFFECT OF THE MARKET, SO-CALLED EXTERNALITY.

FROM THE ECONOMIC POINT OF VIEW, THE ENTERPRISE CAN DEFINE "AN OPTIMAL LEVEL OF POLLUTION"

Environmental Aspects in the Economic System

The influence on the environment is an important unplanned effect of the market, so-called externality. It is a situation where the behaviour of one participant in the economy influences the welfare of another without influencing the market. So if an enterprise negatively influences the environment, it causes involuntary costs for other enterprises and does not pay adequately for them.

From the economic point of view an enterprise will decide by comparing the additional expenses caused by the pollution with the additional expenses caused by the disposal of the pollution. Until the expenses caused by the pollution exceed the costs connected with disposal, the enterprise will be economically interested in the protection of the environment. As soon as the costs for the disposal of the pollution exceed the costs caused by the pollution, the motivation for the enterprise to protect the environment will vanish.

From the economic point of view, the enterprise can define "an optimal level of pollution", at which its additional expenses caused by pollution equal the additional expenses of disposal.

However, the total costs caused by pollution are usually much higher than the costs which are presented and paid by the enterprise. If this difference is too great, it is possible to state that the condition of a free market will cause a high level of environmental pollution and a low level of its disposal.

There are other opinions on how to fight negative externality, which is what the pollution of the environment is.

Joseph Schumpeter thought that negative externalities would cause less damage in monopolised economies than under free market conditions. Private damage caused by pollution and private expenses connected with the reduction of the pollution are approaching, according to Schumpeter, the social damage and expenses and therefore the effort to protect the environment is intensified.

It is a surprising theory, which it is possible to describe as highly disputable.

The governments that use various direct and indirect tools are important in the fight against the negative externality of the pollution of the environment.

The setting of limits of the major polluting substances can be a direct method of reducing pollution. It is quite a problematic method. The limits often do not respect "the effective level of pollution" and they tend to put it down to zero, which increases the expense. At the same time the introduction of the limits is not accompanied by sufficient sanctions for breaking them. Enterprises can either ignore them or find a way round them.

It is possible to complete the direct methods for the control of the level of environmental pollution by the following measures. For instance it is possible to order enterprises to take water from a river under their own waste discharge outlet.

Taxes on emissions are often suggested as an indirect method. Through them enterprises are forced to pay for the external expenses that they cause to their surroundings by a negative influence on the environment. Private damage is

balanced against social expenses for pollution through taxes on emissions. The suitable calculation of taxes on emissions is the basic problem.

The Chicago economist Ronald Coase has formulated an interesting theory. In his opinion, the influence of the state in the protection of the environment is often quite expensive and slow-moving. Therefore he suggested that the subjects concerned should negotiate directly with each other about the effective level of pollution and try to reach an agreement. If an agreement is not reached, the subjects concerned would start to "communicate" with each other through the state. The clear definition of the subjects concerned, their relatively low number and low expenses connected with possible court-cases are preconditions for success.

"Environmental economy" is an economic system taking into consideration the influence of economic activities on the environment and regulating this externality by a combination of public and private attitudes.

A gradual clarification of the state budget could play a positive role. The state went in this direction in health and social insurance when it legalised obligatory payments for this purpose and charged specific institutions with managing them. In the case of the protection of the environment e.g. "an ecological insurance company", that would control the funds raised by various types of ecological taxes and check their use for ecological purposes, could be such an institution.

Economically Orientated Alternative Scenarios

With the help of generally defined alternative scenarios we have tried to outline the possible future trends in development.

1. Classical (Liberal) Monetary Market Economy

This scenario starts from the presumption that the economic model that arises from the main trend in economic thinking (the classical school - Smith, Ricardo; neoclassical school - Walras, Marshall; monetarism - Friedman; the theory of rational expectations - Lucas; supply side theory - Laffer), will find its place in our country. This movement understands economic theory as a theory of the decision-making of microeconomic subjects. The macroeconomic superstructure is linked to the microeconomic base. In practice, it means that the wealth of a society is created through rich individuals. Private ownership ensures a clear differentiation of economic subjects which clash in economic competition. All their activities lead to the maximisation of profit. The sovereignty of the consumer, who decides whether the supply of the firms is well-founded, is manifested at the same time. The producers bear the main risk of enterprise.

The state ensures the necessary institutional framework of a market economy (courts, banks, stock exchange, army and police), and it keeps an eye on the adherence to agreed principles. Besides this, the state takes over the activities that are not profitable for individual subjects (public assets).

"ENVIRONMENTAL ECONOMY" IS AN ECONOMIC SYSTEM TAKING INTO CONSIDERATION THE INFLUENCE OF ECONOMIC ACTIVITIES ON THE ENVIRONMENT AND REGULATING THIS EXTERNALITY BY A COMBINATION OF PUBLIC AND PRIVATE ATTITUDES.

23

23

THE CLASSICAL
MONETARY MARKET
ECONOMY EMPHASISES
INDIVIDUAL RIGHTS AND
RESPONSIBILITY.
EVERYBODY MAKES
DECISIONS FOR
THEMSELVES.

The classical monetary market economy emphasises individual rights and responsibility. Everybody makes decisions for themselves. It starts from the inner stability of a market economy that automatically leads to an economic balance when all sources are used. Outside interference does not speed up the establishment of the balance, on the contrary it makes it more difficult. Therefore monetary policy (especially the regulation of money in circulation) is a main tool in the regulation of the individual subjects.

The classical monetary market economy demands the high moral maturity of a society. It is very effective because it stimulates the main motives of the individual to act (the maximisation of benefit, selfrealisation and independence). It also has some drawbacks:

- it is anthropocentric (it can lead to egoism, the feeling of power over nature, and the emphasis of horizontal connections in society can lead to society breaking up into "atoms");
- it starts from a strictly rationalist understanding of man (the irrational, or spiritual side of human personality may be pushed to the background);
- in less developed countries, or in countries that went through a period of communist rule, usually the above-mentioned condition of the "high moral maturity of society" for the unperturbed functioning of society is not fulfilled.

2. Classical Monetary Market Economy Which Respects Environment

This scenario is identical with the previous one but with the difference that society is aware of the problems of the environment (thanks to upbringing, education, personal experience and the means of communication) and is willing to solve them. This movement is usually called "free market environmentalism" in Anglo-saxon countries.

The opinion prevails that a market economy, a healthy economy, has the ability and power to solve in time also the problems of the threat to the environment. The key role is played above all by:

a) *The law of supply and demand*

There is no threat to the exhaustion of non-renewable resources, these are regulated by price, or they will be used as late as the period when a replacement will be available. Similarly also top-quality water, air, soil, landscape, or the restoration of this quality is a matter of supply and demand.

b) *The problem of the identification of property rights*

Where it is possible to define property rights (a garden, a factory), it is general experience that the owner is responsible for taking care of the entrusted property. If it is possible to appropriate even things so far understood as "common", such as natural resources, into private ownership and administration, the problem will be solved.

23

THE STATE ENTERS THE
ECONOMY ONLY WHEN
THE MARKET FAILS. AS A
MAIN TOOL IT USES ABOVE
ALL FISCAL POLICY

3. Keynesian Monetary Market Economy

We can also call this scenario "a socially orientated market economy".

It completely takes over the whole neoclassical microeconomy, i.e. it does not abolish the basic system-forming principles of a market economy, but it builds on it a new type of macroeconomic analysis that starts from the following consideration:

The main motor of economic growth is investment. The neoclassical presumption of the perfect knowledge of the economic subjects is not valid, the economic subjects are exposed to risk all the time. Considering this risk, the impulses for investment are reduced. It is worth saving and not investing (the interest rate is higher than the expected income from investment). The market is not consistent, the state must help to ensure the impulses for investment and the use of savings left unused.

The state enters the economy only when the market fails. As a main tool it uses above all fiscal policy, starting from the conception of a cyclically balanced budget (in a crisis period a budget deficit is admitted to quickly revive growth and preserve the employment-rate, in a boom period this deficit should be paid back). Until the market fails, it is not necessary for the state to become involved.

The idea that the state has to be involved in the direct control of the economy, or to replace the market all the time, is a wrong interpretation of Keynes. Nevertheless, in practice, the functioning of the market is usually regulated by the state and its institutions through higher taxes that are then used both in the social and cultural spheres (the system of education, health services, culture, the support of charity organisations etc.) and for the strategic influencing of the national economy (subsidies, appropriations and preference for certain types of transport, the selective development of the sectors considered to have good prospects etc.).

Keynes' scenario has similar drawbacks to the previous two scenarios:

- it is anthropocentric, even though extreme individualism and egoism are here held in check by the intervention of the state (it is a formal attempt at a higher level of collectivism);
- it starts from a rationalist understanding of man, the irrational, or spiritual side of human personality may be pushed into the background;
- on its own it in no way guarantees the fulfillment of the condition for the unperturbed functioning of the economy - "the high moral maturity of a society".
-

Keynes' market economy is social because it is organised in a more formally collectivist way and because many functions, that in a classical market economy are fulfilled e.g. the church, foundations, are taken over by the state. In fact it is a pessimistic view of the businessman as a man. The state cannot force the businessman to pay for social purposes, but these activities are in progress voluntarily through churches or foundations and businessmen may not take them into consideration. So Keynes' market economy is not "social" in the sense "more human".

4. Socially Orientated Market Economy Which Respects the Care of the Environment

This scenario is identical with the previous one, but includes the fact that society is aware of the problems of the environment (thanks to upbringing, education, personal experience and the mass media) and it is willing to solve them. However the orientation of the economy towards growth and an increase in the material standard of living survives. Above all the state intervenes in the economy and supports the development of ecological technologies, the development of a recycling economy. It supports environmentally suitable products and services through tax relief, appropriations etc.

The opinion is still held that to ensure the further material growth of the standard of living is within the power of human knowledge and science. The standard of living of western-european countries is the generally accepted standard.

When they attain a certain material standard of living, big and important social groups can gradually deviate from material values and transfer to a information, post-industrial society. Greater attention then can be paid to the strategy of sustainable development and society can be prepared also for limited economisation. More precisely - clean air, water, a healthy landscape, reduced work stress and supportive relationships between people start to be considered as a part of the standard of living.

The scenario may seem to be an acceptable compromise between the environmentalists and economists, as a certain starting point for the first years of the next century.

5. Emphatic Orientation of a Society Towards Sustainable Development

This scenario is close to an ordoliberal monetary market economy (represented by W. Eucken, K. Adenauer, L. Erhard). This differs from the classical monetary market economy and the Keynesian monetary market economy in that it is not anthropocentric. Man is not understood as "the centre of the Universe", while preserving his personal freedom he submits to the order (ordo), which is greater than him. Apart from the horizontal relationships in a society, the vertical ones, which prevent the break-up of society into atoms, are also preserved. Man understands the sense of his existence not only in the satisfaction of his interests (often without regard to others), but in "the fulfilling of his mission", which he has towards the existing order (the satisfaction of his interests is included in it).

A different value orientation as the basis of a market economy leads to an increased interest in social reforms. This interest is not forced by the state, but is based on the voluntary agreement of free individuals. The voluntary increased interest in social reforms prevents polarisation, it leads to a multi-layered structure, in which the middle layers play an important role.

MAN UNDERSTANDS THE SENSE OF HIS EXISTENCE NOT ONLY IN THE SATISFACTION OF HIS INTERESTS, BUT IN "THE FULFILLING OF HIS MISSION", WHICH HE HAS TOWARDS THE EXISTING ORDER

The ordoliberal scenario does not understand man as only a rational being. To a greater extent it takes into consideration his spiritual or "irrational" side, and especially his connection with "the absolute horizon". Therefore the Christian movements are its supporters.

In Asia this scenario is based on Confucianism. In this orientation the reason for the quick development of "Asian tigers" and Japan is often seen. For Europe it is a challenge to go back to its two thousand year old roots.

The scenario of the emphatic orientation of society towards development also starts from the presupposition that the whole present philosophy of material growth and welfare is not tenable from the long-term and global points of view. Both former dominant social systems, socialism and capitalism, have in fact the same aim - a consumer society. Both lead to an ecological crisis. The victory of capitalism may be relative, the orientation towards a consumer society is wrong even here. New technology, the development of sciences etc. alone cannot solve the problems, a change of value orientation is necessary. A change from anthropocentrism (man as the centre of events, conqueror, ruler, hunter etc.) to biocentrism (nатуроцентризм) or theocentrism, or to ecological humanism is fundamental. The growth of the material standard of living can be substituted by a growth in the quality of life and the development of human personality, above all in the neglected and nearly abandoned spiritual dimension. Decentralisation (of settlement, executive power, production) and self-sufficiency (in energy but also generally human) is characteristic too.

6. "The Wild Card"

By "the wild card" we understand the scenario of development in which an event which is not likely and hardly foreseeable will take place, but if it does take place, by its influence it will overpower the other trends from which "normal" scenarios start. We have in mind above all an unexpected or even catastrophic event such as a hole in the ozone layer, the green house effect, the enormous migration of inhabitants from poor or unsafe territories, strong competition with the state by international drug and terrorist groups etc. This can lead to "a retardation", an endangering of the nation and to a call for authoritarian government, an enlightened dictator, which could change into a "hard" dictatorship whether ultra left-wing or ultra right-wing, whether with a communist, nationalist, ecological or religious ideology.

In this case the scenario would probably abandon the principles of a market economy. It would be a controlled monetary economy based on strict state paternalism. The economy as a whole would set specific goals, whose realisation would be ensured by state directives which would have the force of law. The basic system-forming elements would be:

- the state ownership of the means of production;
- the abolition of the freedom to make contracts;
- closed markets;
- the shift of responsibility for obligations to the centre.

THE ORDILIBERAL SCENARIO DOES NOT UNDERSTAND MAN AS ONLY A RATIONAL BEING. TO A GREATER EXTENT IT TAKES INTO CONSIDERATION HIS SPIRITUAL SIDE

SCENARIO WOULD PROBABLY ABANDON THE PRINCIPLES OF A MARKET ECONOMY

The flow of material rather than the flow of money would be considered to be dominant.

On a global canvas there are at least three potential groups of problems that could cause the realisation of this scenario.

a) Ecological problems

The exhaustion of natural, non-renewable resources to which the market is not able to react, or reacts too late, the collapse of ecosystems as a result of their long-term overloading, the coming of global ecological problems such as a hole in the ozone layer, the greenhouse effect or energy problems resulting from the exhaustion of fossil fuels and the inability of science and industry to produce compensatory effective technology for the exploitation of alternative resources etc.

b) The problems of North-South relationships

It is above all a problem of poverty. The relationship between the rich and developed North and the poor and developing South will replace the past East - West bipolarity. Around the year 2000, the "developed" society will represent less than one fifth of the world's population. Mass manifestations of dissatisfaction with the present international (not only economic) order (today the mass media are accessible everywhere and people in poor regions know the standard of living of the North and they refuse to accept passively their fate any longer) may occur.

International tension may lead to economic chaos, to the refusal of the idea of democracy and liberalism as having no potential in poor countries, to the escalation of (religious) fanaticism and to cultures different from us proclaiming to fight for the rights of the poor (today some potentially rich Islamic states find themselves in this position).

c) The crisis of the values of Western society

It is manifested by the desire for change, for doing away with "the boredom, nothingness and emptiness", by the desire to experiment with foreign cultures, religions and ideologies, with political radicalism, with violence, drugs etc. Especially among the younger generation, a contempt for material values, but also a desire for a life of asceticism, self-sacrifice, self-denial, heroism etc. may appear, which could lead to the feeling that violence and wars are acceptable, especially where the generation which did not go through the war is concerned.

It would be possible to create many independent scenarios on this topic, in brief, however, some of the following situations could become decisive in the next two or three decades:

The greenhouse effect - global warming - the thawing of icebergs and the change of climatic zones - the flooding of vast coastal areas and islands and a change in the conditions in agriculture - a great migration of inhabitants, "the exodus of nations" - social and national tension, the questioning and ignoring of state borders - unrest, armed conflict - economic decline and the appearance of authoritarian or military regimes and dictatorships.

Similarly: ecological problems and poverty - international tension and conflicts where the UNO or the U.S.A. no longer manage to "quench" the fires of tyranny (e.g. Iraq) and the falling apart of social systems (e.g. Somalia, Rwanda, former Yugoslavia) - economic chaos - the intensification of economic injustice and making the extremes visible - the crisis of values in western societies - the fight of extremists, nationalists and fundamentalists for "justice and a new order" - the successful spread of some ideologies or religions into non-traditional areas (e.g. the spreading of Islam into the U.S.A., Canada, central Africa and south-west Europe) - the clashes of cultures - general confusion and chaos - the victory of a new, maybe "barbaric" from our point of view, type of civilisation.

So in the "wild card" scenario we must above all take into consideration unexpected external influences that will hit Euro-american culture and civilisation and in this way also us. A paradox may appear that, at the moment when some nations are standing at the threshold of a solution to ecological problems on their territory (the successfully realised forth and fifth scenarios), they could be "pushed away" by another, "more vital" society.

It is possible to play the wild card even at home. A couple of years ago the break-up of Czechoslovakia could have been a wild card, today or in the future it might be the victory of an extremely left-wing or right-wing dictatorship, the taking over of the country by organised crime, that has become an equal partner to the state as far as power and importance are concerned (e.g. in Columbia), the explosion of a nuclear power station (e.g. due to a terrorist attack), unexpected intensive problems with the demands of national minorities, accompanied by the questioning of borders, demands to create autonomous areas or selfgoverned regions backed by force etc.

Under these conditions, development in individual sectors and the development of society as a whole would be unpredictable, uncontrollable and chaotic. The effort to re-establish "a normal state", which presupposes a functioning legal system, a democratic political system and a market-led economy, would be the most important in such a case.

The desirable scenario (scenario No. 5 - the emphatic orientation of society towards sustainable development) will probably not be adopted at once, in one go, but more probably gradually. It is e.g. possible, that the scenario of the classical monetary market economy, to which the present reality may be closest, will come gradually under the pressure of environmental movements and the increasing awareness of the public and will be changed into the scenario of the monetary market economy which respects the care of the environment. It is also possible that after a certain time the citizens will start to prefer a more socially-orientated development of society. Today's orientation towards the radically promoted (at least formally) classical monetary market economy may be a reaction to the previous extreme, to the centrally planned economy. Then, after a pendulum effect from one extreme to another, a shift more to the centre could happen. In this case, a scenario similar to Keynesian monetary market economy could start to be implemented. However, again under the pressure of outside (environmental) conditions, it could change into the scenario of a socially-orientated economy which respects the care of the environment. We think that a socially-orientated economy is closer to our nation also because of our cultural traditions and mentality, conditioned by our historical experience, religious orientation (Christianity) and geographical location (the influences of East and West). Nevertheless, how close these considerations will be to real developments is difficult to predict.

INTERNATIONAL TENSION
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The scenarios that presume respect for the protection of the environment could precede a really fundamental change, which would affect the political and economic system but above all our value orientation. The scenario of the emphatic orientation of society towards sustainable development should represent the strategy of this change.

We do not want to define exactly the time perspective of the diserable scenarios, but we presume a probable 25-year perspective (i.e. to about the year 2020), for the following reasons:

- on a global canvas we have at most several decades for the realisation of a fundamental quality change in the development of society according to many calculations;
- 25 years is a period in which the present generation of 30 to 40 year old people, who are now gradually getting into the most important positions in controlling society and are mainly responsible for development, will complete their efforts or life mission and they will pass the "baton" to the following generation;
- it is also a period after which today's children, not affected by the period of communism, will take over the control of society;
- within 25 years it is possible to make consistent amends for the loss caused by the previous regime in the political, economic and maybe also cultural fields;
- in our opinion it is a maximal period (time perspective), in which it is possible to try to work out a strategy of sustainable development, and we believe that this is also a period in which it is possible in practice to introduce the transformation of society to a sustainable way of life.

A Long-Term Model of the Czech Economy

A Long-term Model of the Czech Economy (LTMCE) starts from the class of so-called CGE models (Computable General Equilibrium models). The CGE model is a relatively new type of model, developed in the U.S.A. (Devarajan, S., Lewis, J.D., Robinson, S., 1991).

The CGE model simulates the market behaviour of economic subjects with the use of quite a wide scale of mechanisms balancing supply and demand. It enables us to simulate the impacts of an intended economic policy (fiscal, budgetary, foreign currency and currency etc.), to estimate the reactions of a modelled object to changed outside conditions (e.g. world prices).

The majority of CGE models start from a neoclassical conception, i.e. from the presumptions of perfectly functioning markets with flexible prices, however even the Keynesian attitude is not excluded.

The CGE models can be also used to create a model of the economies of developing countries, where the neoclassical preconditions are not fulfilled at all. In those cases various types of "structuralist" rigidities or modelling imperfections of market mechanisms are incorporated.

The CGE models enable us to create the detailed description of an object from the structural point of view. The division into sectors, or branches of the economy, is usual. The models divided in this way are usually construed as static. The parameters of the equations of the CGE models are usually estimated by experts.

Prognostic Simulation

To reach the economic level of the developed countries is considered as a legitimate goal. But to reach this goal obviously presumes a long period of quite striking growth. The question is, how and under what conditions is it possible to reach this growth?

So in this case we will deal only with a growth scenario (so it is a mathematical model of the above-mentioned scenario No 1 - a classical monetary market economy), which:

- respects the given reality (the present state of the economy);
- respects the most likely developmental trends (a gradual incorporation of the Czech Republic into European Union);
- takes no account of the existing extra-economic limitations (e.g. the accessibility of raw material and other resources);
- does not have the goal of explicitly formulating an economic policy leading to the reaching of the growth goal.

The Growth Scenario

Note: In the description we start from charts No. 10-16. It is possible to divide the period 1994 to 2025 into three slightly different periods.

The period 1994 to 2000

The year 1994 was the end of the period of recession in the developed European countries. In the Czech Republic, privatisation was completed by the second wave of privatisation, and the market arrangement of the economy continues to stabilise. With inflation at 12.7% (measured by the deflator of Gross Domestic Product) there is a slight, 2.4% growth in real GDP. Growth started when the deficit in the balance of foreign trade (12.5 billion crowns), with a stabilised currency exchange rate, was low. The growth of the economy in 1994 was, is and will continue to be in subsequent years conditioned by the gradual lowering of the proportion of the internal consumption of output (see UQI). This effect will be reached by a combination of modernisation and structural changes. In 1995 the real GDP increased by 5.5%. The number of workers declined from 4.78 million in 1994 to



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4.75 million with the unemployment rate at 3.1%. The growth of the economy, with still high inflation around 10% and the effort to keep a stabilised currency exchange rate, was accompanied by a steep growth in imports and stagnation in exports. The increasing deficit of the balance of trade, however, enabled the increased creation of fixed capital; this was then a factor in further growth. As a result of the relentless flood of foreign capital there was actual 2.6% revaluation.

The growth of the economy in 1996 will be comparable with 1995. The number of workers (under the influence of the migration of the increased supply of labour) will increase to 4.8 million. The unemployment rate will be stabilised at 3.1%. Inflation will still be at the high level of 9%. The growth in the deficit of the balance of trade to 75 billion crowns, together with the impact of the introduction of the convertibility of the crown, will lead to a devaluation of nearly 6%. Once started, annual devaluation of about 5% will last till the year 2000, when the annual rate of inflation will be reduced to 3 to 4% (the level approaching the values in the developed countries). The deficit in the balance of trade will be gradually reduced to zero in the year 2000.

The period 2001 to 2013

The character of this period is determined by the entry of the Czech Republic into the European Union. The parameters of the Czech economy and the parameters of the developed European economies will come closer and closer together. If we compare the proportions of macroaggregates in GDP with the corresponding values of chosen countries of the OECD, we can see e.g. that the proportions of import and export in GDP in the Czech Republic will be, even in the year 2001, fundamentally higher than in Switzerland, the country which shows the highest values in the table. The scenario supposes a gradual decline in the proportions of import and export in GDP.

The adjusting processes will be in progress without substantial problems till 2013. The average growth of real GDP in this period will be 4.1%. The number of workers will be stabilised at 4.8 million and the unemployment rate at 3.1%.

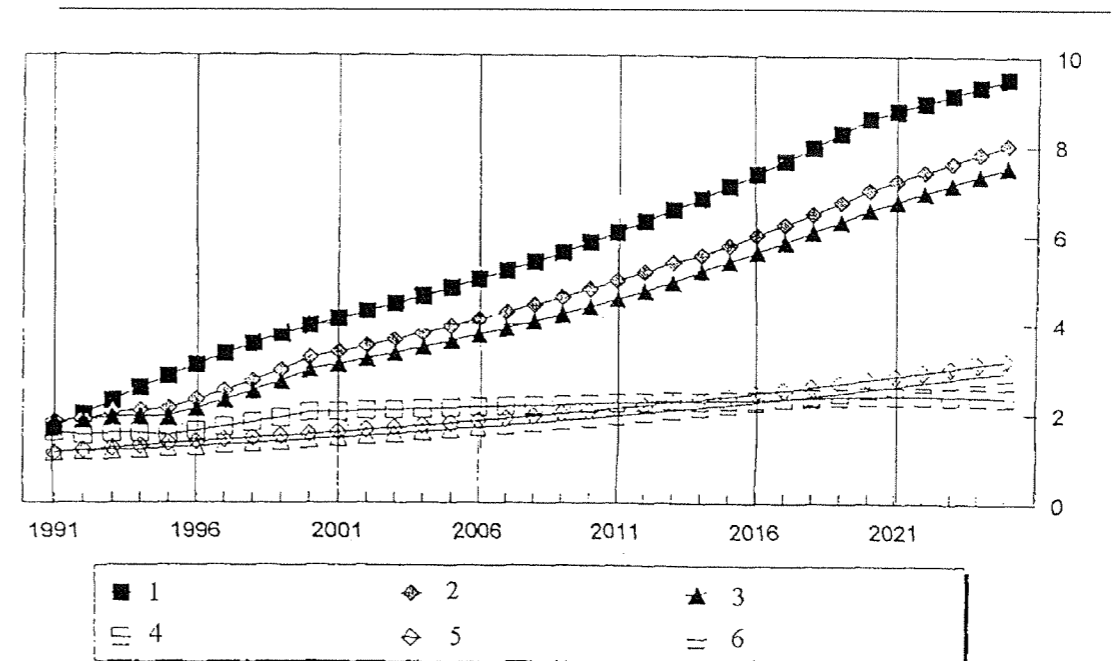
The period 2014 to 2025

The preceding long-term economic success will lead to the increased migration of labour into the Czech Republic. The number of workers will be slightly increased (to 4.85 million), and so will the unemployment rate (to 5%). The preservation of the real rate of growth of the economy at over 4% per year will demand an increase in the proportion of fixed capital in GDP to 30% and a corresponding decline in the proportion of private consumption in GDP, because the external financing of investments is not assumed. The proportions of import and export in GDP will continue to decline to a value around 50%.

The creation of this functioning model opened the way to the construction of more sophisticated scenarios.

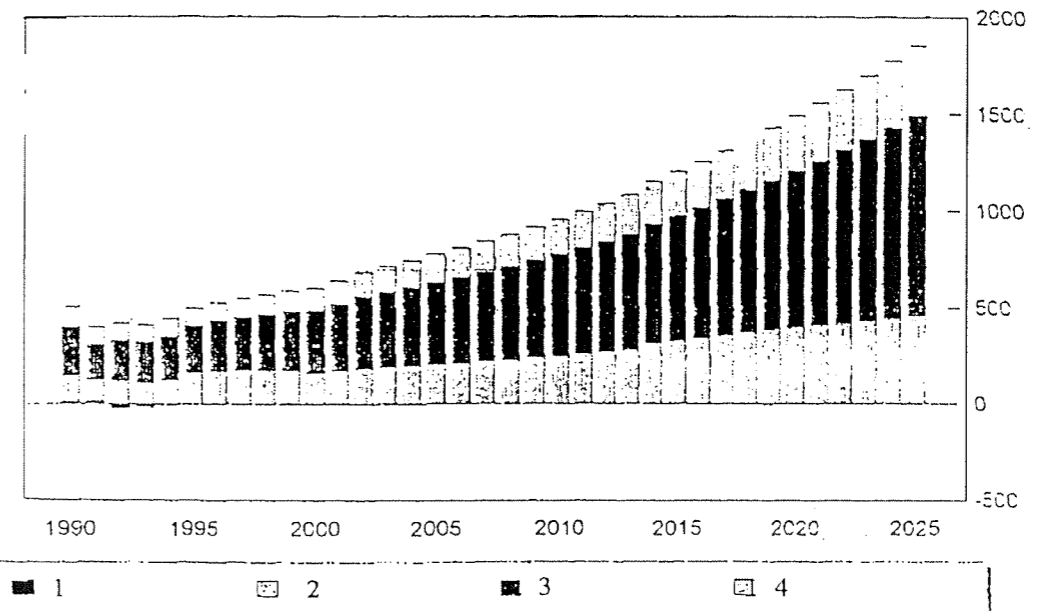
THE PRECEDING LONG-TERM ECONOMIC SUCCESS WILL LEAD TO THE INCREASED MIGRATION OF LABOUR INTO THE CZECH REPUBLIC

Chart No.9 - Czech Republic - Index of Prices (1984 = 1)



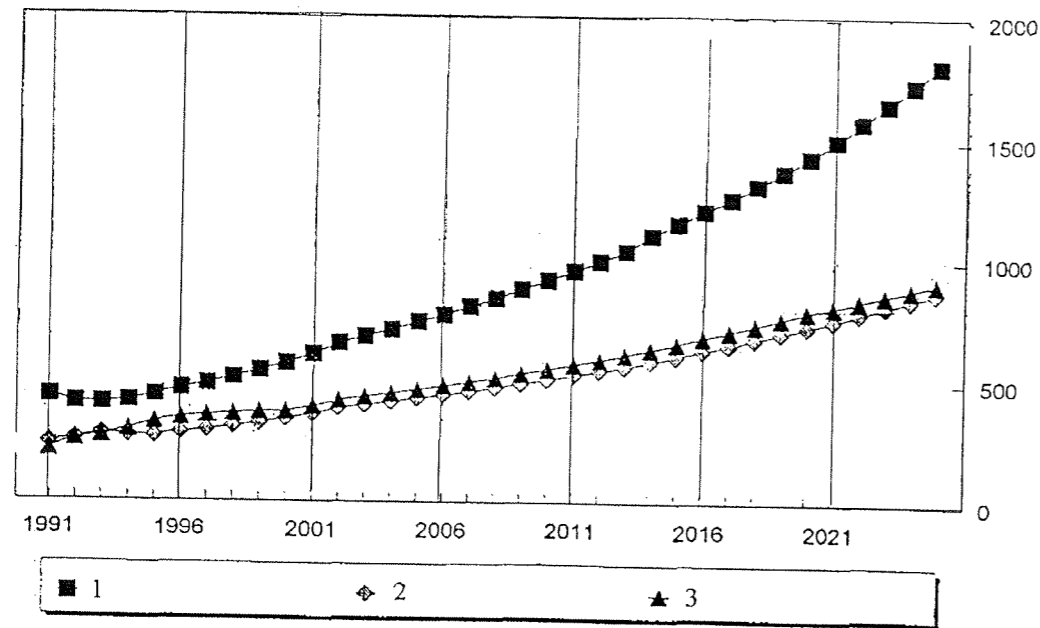
1 - Deflator of Gross Domestic Product, 2 - Export (Domestic Price), 3 - Import (Domestic Price), 4 - Currency Exchange Rate (Index), 5 - Export (World Price), 6 - Import (World Price)

Chart No.10 - Czech Republic - Final Domestic Consumption (Fixed Prices, Billions Cz.Crowns)



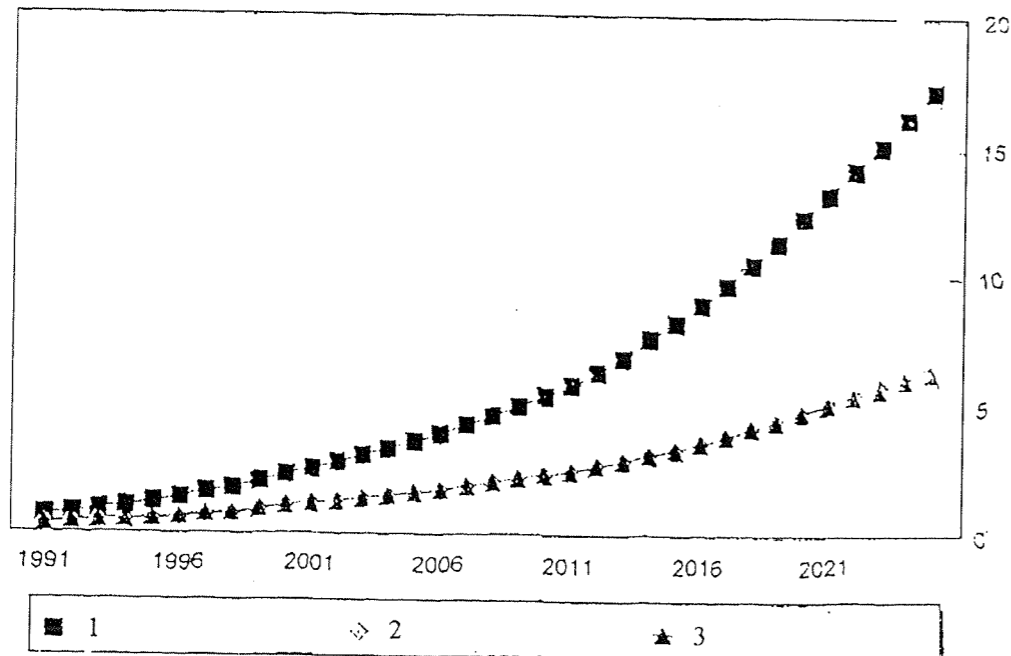
1 - Change of Balance of the Stock, 2 - Creation of Fixed Capital, 3 - Private Consumption, 4 - Government Consumption
1 USD = 27 Czech Crowns

Chart No.11 - Czech Republic - Foreign Trade (Fixed Prices, Billions Cz.Crowns)



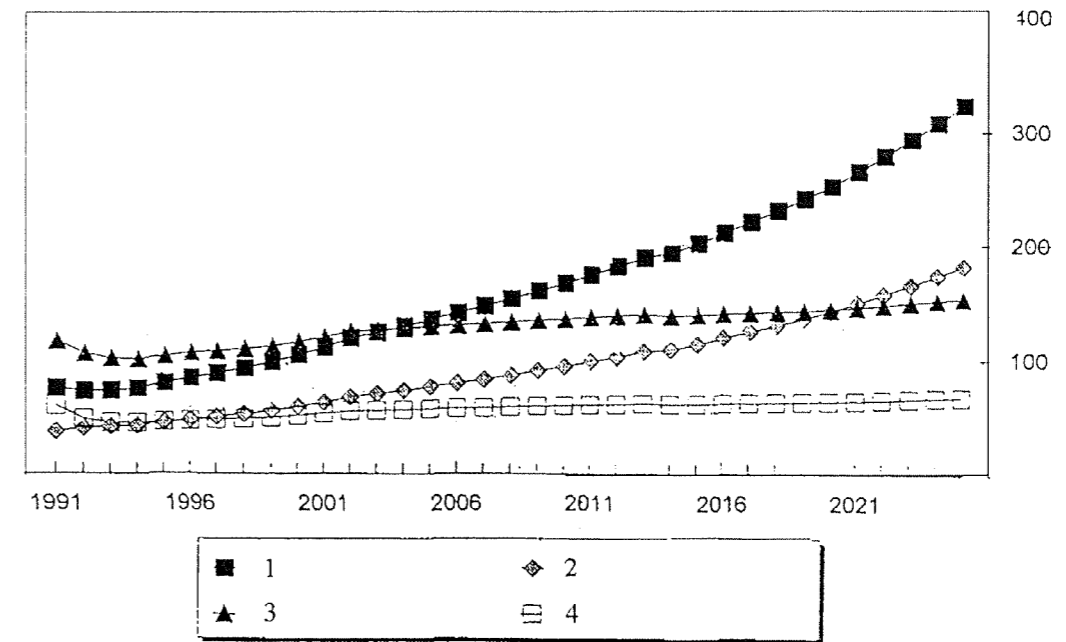
1 - Gross Domestic Product, 2 - Export (Free on Boards), 3 - Import (Trade Parity)

Chart No.12 - Czech Republic - Foreign Trade (Current Prices, Billions Cz.Crowns)



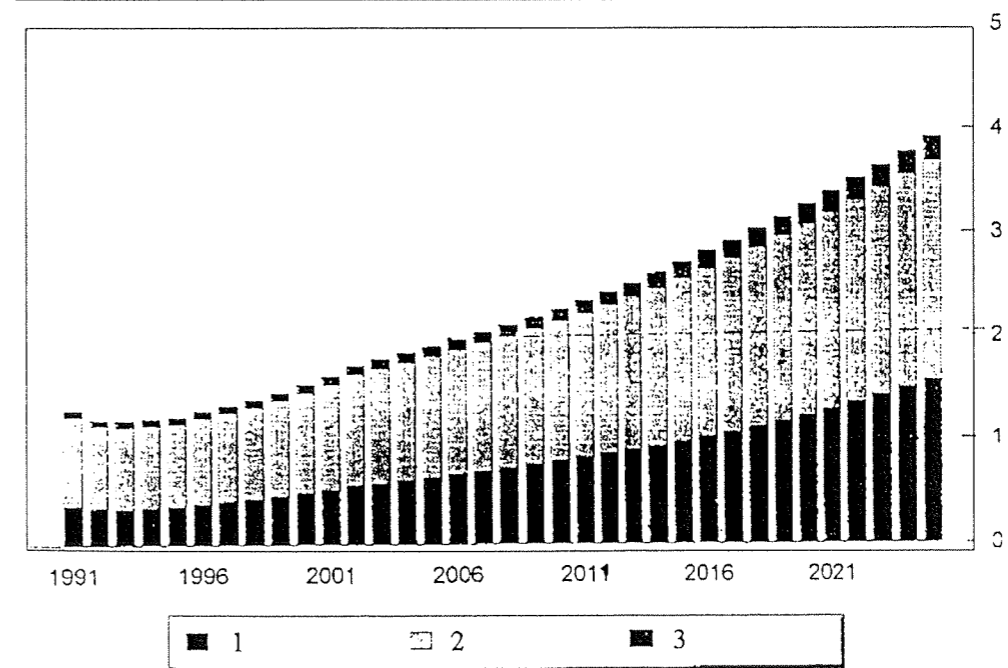
1 - Gross Domestic Product, 2 - Export (Free on Boards), 3 - Import (Trade Parity)

Chart No.13 - Czech Republic - Productivity of Labour and Capital (Thous.Cz.Crowns per Capita)



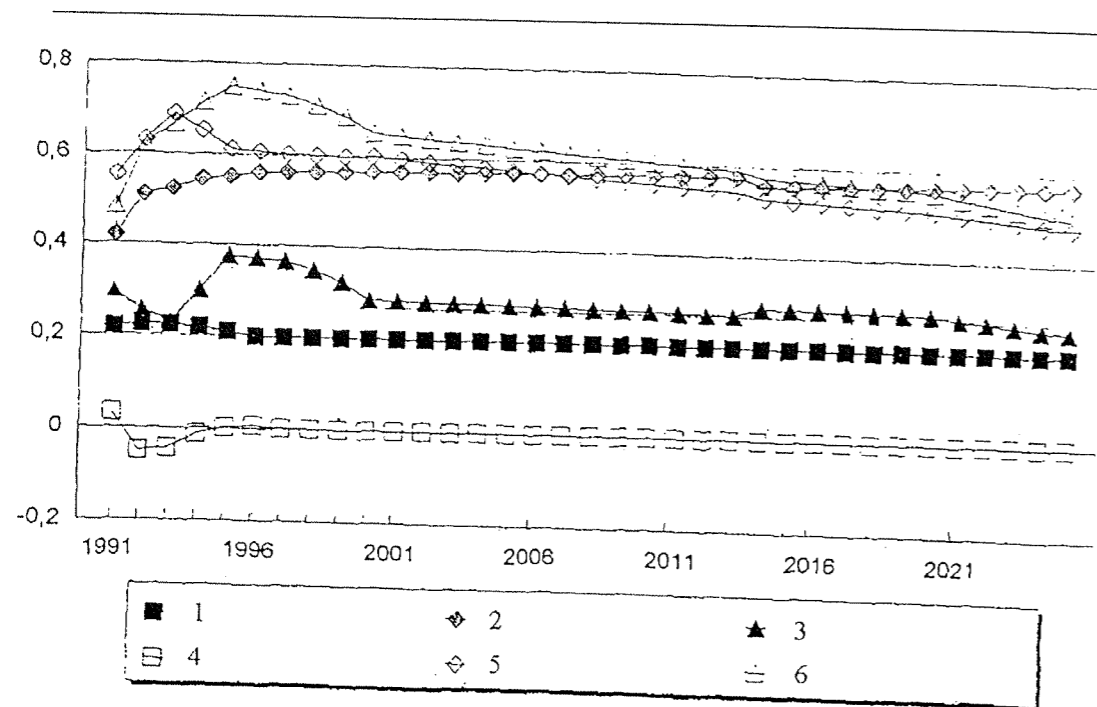
1 - Productivity of Labour, 2 - Marginal Productivity of Labour, 3 - Productivity of Capital, 4 - Marginal Productivity of Capital

Chart No.14 -- Czech Republic - Output (Fixed Prices, Thous. of Billions Cz.Crowns)



1 - Value Added, 2 - Intermediate Product, 3 - Indirect Tax

Chart No.15 - Czech Republic - Proportions of Macroaggregates (Fixed Prices)



1 - Government Consumption, 2 - Private Consumption, 3 - Creation of Fixed Capital, 4 - Change of Stock Balance, 5 - Export, 6 - Import

25

Political System

Internal Political Consequences of the Break-Up of Czechoslovakia

Even before the elections in June 1992, it was clear that two mutually connected processes could threaten the integrity of Czechoslovakia:

- the creation of incommensurable political structures;
- the creation of incommensurable economic mechanisms in both republics.

Actual problems will be ideologised, the right and left-wing polarisation of society and the oscillation between political "pragmatism" in the Czech lands ("If they want, let them go.") and national fundamentalism in Slovakia ("Let us rule ourselves.") eventually resulted in the two closest nations in central Europe not finding enough will for a consensus on the arrangement for constitutional law. Or more precisely: it was political élites, who had sprung out of the shaking ground of post-totalitarian society, who did not find it.

In the Czech Republic a new situation for political agitation by the Slovak and German minorities has been created. The proportion of the Slovak minority in the population has increased since the break-up of Czechoslovakia and in the case of a dramatic development in the economic and social fields even their real political power will considerably increase.

Today we are not able to imagine the reunion of both republics into a whole in any other way than under the flag of a unified Europe. So if now there is a really sensible programme of constitutional law for Czechs and Slovaks, it is a programme of the construction of two independent states corresponding to the standards and norms of present-day western Europe.

From the taxonomic point of view it is possible to define the possible basic problems of power in the development of former Czechoslovakia after the Velvet Revolution of November 1989 in the following way:

- the ideologisation of power is unconscious communist resentment. Instead of a paradigm of the solutions to problems, those who wield political power wrap their intentions in right-wing, left-wing, nationalist or other phrases of not objective but ideologically coloured rhetoric.
- the delegation of power. Where power is ideologised, the delegation of power takes place on the basis of membership and not on the basis of competence.
- the rhetoric of power élites lacks a consensual dimension (a number of the Right has nothing to talk about with a member of the Left).
- in a nonconsensual policy the aim of the mass media is not to inform but to promote the interests of the political élites.
- in the exercise of power, checks and balances have the character of mutual spying and scandalisation.
- under these conditions many other deviations prosper. Power puts on a mask of exclusiveness, its representatives suffer the complex of messianism, they lose their feedback from the public and easily fall when arguing into an extravagant populism.

What can be done about this? We can see one of the possibilities in applying the principle of participation. The participatory principle as a way of increasing the culture of power is not new. It has been spoken about for at least two decades. The enchantment of participation does not consist only in the fact that it engages the participants in political life - disregarding their professional roles - in topical political events, but also because it works as active social education.

In such a case, the principles of tolerance and complementarity, that define the area of a consensual and dialogical attitude to solving political problems, can be applied.

Politics With Good Prospects

After the fall of the totalitarian ideologies of the 20th century - fascism and communism - the borders of real and possible conflict shifted to the boundary line of great cultures, that are created above all by the largest mass monotheistic religions. The peaceful coexistence of the faithful of these religions is problematic,

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in spite of the fact that they manifest nearly the same values - family, justice, truth, love and humanity. They irreconcilably differ from each other in authorities, symbols and the rituals of their faith. The consequences of the incommensurability of big religions could be fatal for the world if no way is found for a consensus where it is possible and a sort of "tolerant disagreement" where consensus is not possible.

Consensus is possible where actual problems are concerned (crime and the feeling of security, economic prosperity, the quality of the environment etc.). Common acknowledgment of the seriousness of such problems and common involvement in solving them are preconditions for the normal coexistence of people otherwise orientated in a different way.

The principles of tolerance and complementarity are the guiding principles. Both principles assume the faith that different views of the world can exist not only in a parallel and sensible way (the principle of tolerance), but they can even mutually complement and enrich each other (the principle of complementarity).

A dialogue involving people of various identities, opinions of the world and membership of various political parties are an instrumental background for the application of the principle of tolerance and complementarity. The dialogue is one in which people exchange opinions on problems and solutions.

For the representatives of hierarchies the awareness itself of the possibility of the complementarity of various truths, however, often means overstepping what is allowed, a threat to the integrity of the world in which they are anchored and a threat to their own integrity and power.

The theme of minorities is an indicator of the state of the solution to this problem. Only the willingness and ability of the majority to give a religious, national or any other minority full spiritual or cultural autonomy is a signal that a dialogue exists and mutual tolerance and cooperation are possible.

An open civil society is an environment in which the fact of the autonomy of nations, ethnic groups, communities and social groups is understood as a natural state of affairs. That is because the autonomy of each individual is also understood as a natural state of affairs. What, however, is an open society "here and now"? It is a society open to other things besides the flow of ideas, people and goods etc. Tolerance and the ability to conduct a dialogue, and faith in the mutual complementarity of various views of the world would not alone be enough. And even a government of reason, stressing actual problems, would not be sufficient. Openness, if it is not supposed to be self-destructive, assumes a certainty that it will not cause "diffusion" and chaos. Stability in an open society is also ensured by a necessary level of intolerance, firm control of the rules of the game, the authority of the law and institutions that supervise its observance, it is the self-confidence of the state, the nation, social and ethnic groups and the individual who is able, not only to define the border of his "territory", but is also able to defend it. The political arena is the place where the struggle for openness understood in this way takes place. At certain moments, e.g. during elections or the escalation of social problems, nearly everybody becomes a subject of politics and society as a whole is a political arena. A dialogical system which looks for, dramatises and solves objective problems usually is in such cases indisputably more suitable than conflict or a monologue by the stronger person. Under the conditions of real democracy, such a process takes place against a background of the competition between political parties and



movements on political issues. Those, who gain the favour of a sufficiently large proportion of the electorate for this definition of an issue, win. However as historical experience shows, the public prefers a solution with a short-term effect, or with a visible effect, if possible immediately, or it prefers a solution anchored in faith.

Democracy can be a dangerous weapon in the hands of a crowd, unless there is respect for the authority of the law. In the end, even the law can be a weapon in the hands of a leader or a majority. With icy inexorability, Zbigniew Brzezinski (1993) gave this argument a practical illustration. The coming of Hitler and fascism, or the coming of communism, took place in a formally democratic way in many countries. What chance have citizens to defend themselves, again in a democratic way, against excesses? How can we stop, again in a democratic way, fascist, communist or nationalist fury being repeated again and again?

The awareness of the episodic character of power positions and the strong protection of cultural norms is for democracy as important as the interplay of individual freedoms and collective rights, as the delegation of power on the basis of election results, as the control of power by public opinion, as the revocability of politicians, the independence of the judiciary, the executive or the legislature etc. And there is the meaning of the word democracy itself. It is not understood as a state, but as a tool or a method. A method of the active social learning of people.

Herakleitos stated that people should fight for the laws of the community as if they were its walls.

People who understand the colourful mosaic of living worlds are able to perceive even the complementarity of these worlds, to be tolerant towards the attitudes, values, needs and goals of others. And because such people will be in the minority, it is necessary to understand the basic problem of democracy as the right of this minority to decide on the kind of government, whilst the exercise of power is open to everybody. So the dream about democracy includes also a faith in the right to this privilege for the aristocrats of the spirit. If the majority submits to this dictatorship, we can be optimists. The treacherousness of democracy lies in the fact that ten aggressive idiots and ten decent people have the same weight at the polling station. And we even have not mentioned that decency itself is no qualification.

The Political Implications "Here and Now" - Several Scenarios

After the break-up of Czechoslovakia the developments in both new states went different ways. However, the limits of possibility are the same. It is possible to characterise these basic scenarios in brief.

DEMOCRACY CAN BE A DANGEROUS WEAPON IN THE HANDS OF A CROWD, UNLESS THERE IS RESPECT FOR THE AUTHORITY OF THE LAW. WHAT CHANCE HAVE CITIZENS TO DEFEND THEMSELVES, AGAIN IN A DEMOCRATIC WAY, AGAINST EXCESSES? HOW CAN WE STOP, AGAIN IN A DEMOCRATIC WAY, FASCIST, COMMUNIST OR NATIONALIST FURY BEING REPEATED AGAIN AND AGAIN?
HERAKLEITOS STATED THAT PEOPLE SHOULD FIGHT FOR THE LAWS OF THE COMMUNITY AS IF THEY WERE ITS WALLS.



The first scenario:

Converted communists regained legitimacy on the political scene with the help of democratic elections. It came about through their transformation into social democrats and by covering the space to the left of centre. Their position in the executive and parliament is so strong that they can push through their idea of a strong social state. The West accepts this fact, however, it is watchful. The East accepts this development indifferently - it has enough problems of its own. The lukewarm attitude of the foreign investor is, however, evident and causes social and economic problems. The country is evidently going back to a period of insufficiency. Irrational tension - ethnic and national disagreements, conspiracy explanations for problems, the strong rhetoric of political leaders - increase together. There is a loss of the feeling of the safety and security of ordinary citizens and a close relationship between the economic and political interests of the élites. Some rationally thinking representatives of power can see the solution in central-European co-operation, others in the ideas of Pan-Slavism. The failure of the former supports the chances of others. A new bipolarisation of the world may be a consequence.

The second scenario:

The political élites try to ensure continuity of economic transformation. Shock-therapy and the problems of transformation to a market economy, however, cause indignation in a great number of citizens. The social democratic inclinations of a considerable percentage of voters increases. It is paradoxically accompanied by a belief in the messianic mission of a charismatic leader. This trend affects the whole of central Europe and leads to the stabilisation of conditions. A relatively calm political atmosphere enables political parties and movements to establish clear identities. The inhabitants start to become reconciled with the Platonic character of the dream about a standard of living comparable with the developed democracies in the West. Educated people re-open the discussion about the third way. In the everyday lives of people the problems of social security are predominant. The rich stratum has become established and is beginning to "be rooted" in their positions. Everything indicates that society has established a regime which, until there are foreign political commotions, can go on in this form for many years.

The third scenario:

The transformation of ownership relations has pulled into the whirl of competition a sufficient number of people. The vision of a prosperous society is mobilising and motivating. The political leaders concentrate on calling for the market regulation of social relationships and appeal to the West for a guarantee of security. The will for regional cooperation with postcommunist countries is understood only pragmatically. Attempts to mobilise the masses by national policy are useless. People are willing to sacrifice a part of state sovereignty in exchange for prosperity and membership of the countries with a developed democracy and a high standard of living. The initiative and the spirit of enterprise become a norm of behaviour of the middle classes. However, alongside all this, the activity of social movements, orientated to the solution of the problems of the environment, alternative ways of life, the protection of consumers' interests, the victims of violence, minorities etc., is stronger and stronger. The dialogical attitude to the solution of social problems finds its institutional background in the decentralisation of power to the local level, in



the quick alternation of political élites and in the mass social control of power by the mass media.

The third scenario is not heaven on Earth either. It does, however, enable the entral topic of political and intellectual discussion to be the problem of participatory democracy and the tenability of a dignified life for as many people as possible.

In Place of a Conclusion

According to Hannah Arendt, the relationship of politics and freedom in the light of the present political experience causes dramatic discussions. One of the liberal creeds is "less politics, more freedom". It was not because of a desire for freedom that people asked for participation in government. It was a distrust of those who made decisions about lives and property.

The theme of authority brings limits into the boundlessness of contradictory motivations and acts, because authority assumes a specific type of obedience. Religion, traditions and law and order are the most typical examples of an authoritative order. They are hierarchical and everybody who is a part of them accepts this hierarchy. Arendt considers the crisis of authority as a symptom of the present. According to her, this crisis is political in its origin and character. The liberalisation of social conditions and multiculturalism diffuse the normative system that created a natural order in the world of people living together. Doubts about their own identity, that accompany the diffusion of the normative systems, open the door for aggression and intolerance. A lack of culture and cultural fundamentalism become a paradoxical consequence of the inter-penetration of culture. What can be done about it?

There are two obvious basic ways. The first one is based on the revival of the authority of religion and tradition. The second one more on the "strength" of law and order and the institutions that ensure that the law is observed. Both ways define the limits even for freedom understood in reality and the limits for the free behaviour of people.

Human behaviour results from human knowledge. And because we cannot know today what we will know tomorrow, we cannot know also today how we will behave tomorrow. So the anticipation of the future would be impossible in principle. Nearly everybody, however, is able to recognize a discrepancy between what is and what could or should be. If the problems are not recognised, there can be no solution. The solution of problems has the character of action. And what else is the action itself if not the formation of the future? It is here where there is a space in which the essentially human phenomenon is realised - the fight for power, the fight for the realisation of individual and group projects, visions and models of the world.

It would obviously be useful to understand power itself as an institutionalisation of the will to reach a goal in acceptable ways.

HUMAN BEHAVIOUR
RESULTS FROM HUMAN
KNOWLEDGE



Legal System

The State and Development of Environmental Law

Good and realistic legal regulations are one of the preconditions for the effective protection of the environment. It is one of the basic corner-stones and tools of ecopolicy. In the last six years, great changes have taken place in environmental law, as they have in the legal code as a whole. In the development of these legal regulations it is possible to find three basic trends:

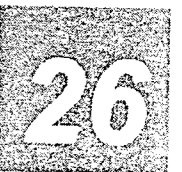
1. the creation of new, good legal regulations for the protection of individual components of the environment, or the protection of the environment from some threats;
2. the issue of framework legal regulations covering the field of the protection of the environment and the legal regulations of the institutions shows the development of the integration of environmental law;
3. the issue of legal norms regulating new democratic elements, that are manifested in the protection of the environment.

The preparation of the Czech Constitution was a great chance to lay down the principles of the protection of the environment, but especially the principles of sustainable development, as basic conditions and preconditions for the further development of our society. However, they did not manage to ensure that the Constitution would make an explicit statement about the questions of the environment and sustainable development. However, it is important that the Constitution of the Czech Republic lays down, that the Document of basic rights and freedoms is a part of the constitutional order. This document includes article No 35 which guarantees the right to a favourable environment and the right to information about the environment. The Constitution also lays down that nobody can damage or threaten the environment over the level set by the law. The constitutional regulation of the execution of some laws, especially the law of property, for the benefit of the environment, is important.

“The Component” Legal Regulations for the Protection of the Environment

The main aim of the work on the legislation concerning individual components of the environment or factors threatening the environment was both to fill in the gaps, which there were in the previous legal regulations, and to replace the outdated legal regulations by new, more modern ones. In this field what is nearly impossible was managed - today a set of legal regulations, new and amended, covering in fact the whole field of the protection of the environment, is in force.

New legal regulations were accepted in the following fields of the protection of the environment:



a) the protection of the atmosphere - law No 309 from 1991, concerning the protection of the atmosphere against pollutants (the law concerning the atmosphere), in the reading of law No 218/1992; law No 389/1991 concerning state management of the protection of the atmosphere and fees for its pollution and executive legal regulations;

b) the protection of nature - law No 114/1992, concerning the protection of nature and the landscape and its executive decree;

c) dealing with waste - law No 238/1991, concerning waste products, law No 311/1991 concerning the management in the economy of waste products and executive regulations;

d) the protection of agricultural soil - law No 334/1992, concerning the protection of agricultural soil.

The water law and the regulations concerning the protection of people's health and the use of raw materials were also amended. Recently, the so-called freon law was passed and a new law concerning forests is being prepared.

It is also important that our legal regulations follow as their model the law of the environment of the European Union. We have put many European institutions and demands of European environmental law into our legal regulations, which is one of the necessary preconditions for the future entry of our country into the European Union.

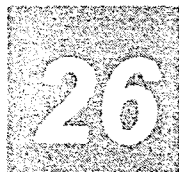
Generally it is possible to say that the legal regulations for the protection of the environment are today one of the successes of the environmental department since 1990. It forms quite a solid base for the ecopolicy of the state.

Nevertheless, these legal regulations are not perfect. The need to create quickly the legal basis of the protection of the environment led to the fact that during the preparation of suggestions of legal norms not enough attention was paid to whether and how these regulations would be applied. The answer to this question is very important if we speak about the quality and the impact of the law. Unworkable law is bad law. Unenforceable law is also bad law. It is not possible to consider these good.

Insufficient preliminary economic analysis of the realism of the needs of environmental law is shown above all in the deadlines that were assigned by some regulations to achieve the prescribed limits.

The lack of economic prudence results also in a certain discrepancy in the field of economic tools. Their aim is, besides the obtaining of funds to finance the measures for the protection of the environment, to be also an incentive for a change in the behaviour of polluters. But at the same time it is necessary for the means to be, to a sensible extent, higher than the production costs for the cleaning equipment and the cost of its operation. From this point of view the use of economic tools does not represent an effective solution.

OUR LEGAL REGULATIONS
FOLLOW AS THEIR MODEL
THE LAW OF THE
ENVIRONMENT OF THE
EUROPEAN UNION



The Basic Legal Regulations and the Integration Tendency of Environmental Law

The passing of environmental law No 17/1992 was an important step in the legal regulations for the protection of the environment. Its importance consists in the fact that it amended the basic principles of the protection of the environment and changed the principles governing the use of natural resources.

Environmental law includes such principles as the principle of prevention, the principle of recompense for damage caused by emissions, the precautionary principle and the rescue principle. It also lays down the definitions of the basic concepts used in environmental law - environment, ecosystem, ecological stability, the tolerable carrying capacity of the territory, natural resources, the protection of the environment and pollution and damage to the environment. The law starts from the principle of sustainable development.

Environmental law also amends some laws and duties when protecting the environment. It is e.g. the right to information, the right to claim one's rights resulting from legal regulations concerning the protection of the environment in a prescribed way etc.

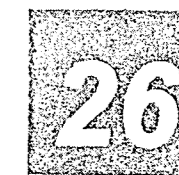
The law formulates the concept of an ecological detriment and defines the forms of its replacement. The law provides the framework for the economic tools of the protection of the environment. It distinguishes both negative and positive economic tools. The provisions concerning the sanctions for damaging the environment are not so clear.

Environmental law also amended the basic principles of the evaluation of the influences of activities on the environment. This amendment on its own, however, is absolutely impossible to apply in practice because of its total vagueness. Only the law about the Environmental Impact Assessment (EIA) No 244/1992 gave a real character to this institute.

It is possible to consider environmental law as one of the first steps, marking a new phase in the development of environmental rights in our country. "The component character" was characteristic for this legal field till recently. However, since 1991, this kind of legal regulation has started to change. New institutions, which are common to the whole field of the protection of the environment and are not typical only for one of its components, have started to appear. For the first time this development is visible in the institutional area. In 1991 both the Czech environmental inspectorate and the State fund for the environment of the Czech Republic were established.

Environmental Impact Assessment (EIA) is a new institute, which it is possible to consider as an institute for the integrated protection of the environment. In our country this EIA is, besides environmental law, controlled by law No 244/1991. It is an important tool for prevention.

In the developed countries, EIA is understood as one of the most important tools for the protection of the environment and its introduction is one of the criteria of the reliability of the attitude to ecological problems.



In the same way as unified principles for the protection of the environment and the process of EIA, it will be suitable also to amend further institutes. As an example it is possible to show the administrative decision in the field of the environment. Today an investor needs, e.g. in the case of one building, several permits, issued through various administrative procedures according to individual component regulations. It would be very useful to amalgamate these administrative procedures, so it would be possible to issue one permit relating to all ecological aspects of a building, equipment, technology etc.

Besides the fact, that this procedure would enable a substantial simplification of state administration, it has also another, maybe more important aspect. It leads to the integrated understanding of the protection of the environment in which the mutual connection of individual components of the environment is respected. In this way it is possible to prevent the "overspilling" of pollution from one component to another, to which the component attitude leads. Integration leads to a search for a solution consisting of changes in production methods, in the effective use of raw and processed materials, in recycling etc.

The Democratic Institutes of Environmental Law

The introduction of some principles and methods that characterise a certain level of democratisation in a society is one of the important objectives in working on new regulations of environmental law. The participation of the public in making decisions about the questions of the environment and free access to information as a basic precondition of this participation of the public are considered to be such institutes.

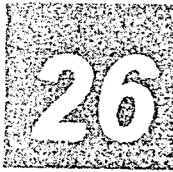
The introduction of EIA in its full form, i.e. making the participation of the public possible, was the first "break-through" into this understanding.

The "qualified" public (fulfilling the conditions assigned by the law) can even become a participant in administrative actions after the end of the process of EIA.

The establishment of the right to information about the environment was a democratic element in our environmental law. Besides the law concerning the protection of nature and the landscape, however, no legal norm controls the mechanisms by which this law is applied, by which forms and methods, when, where and from whom citizens can obtain necessary information about the environment and, the other way round, how in practice the corresponding duty of those who should provide this information should be fulfilled.

As far as the future development of environmental law in our country is concerned, it is possible to assume the two basic streams that will be in progress at the same time. One of them is the above-mentioned effort to gradually integrate the law of the environment and the protection of the environment. A new law concerning the environment which would amend the integrated institutes and processes and connect executive and jurisdiction regulations may be a result.

The amendment and completion of the component legal regulation will be a second stream. What will be especially important is the passing of a new law concerning forests and a fundamental amendment of the water law.



It will also be necessary to pass a law concerning production, import, export and the use of substances dangerous for the environment. This regulation, among other things, should ensure the discharge of our duty resulting from the Montreal protocol on the protection of the ozone layer.

Also the duty to upvalue the ecological obligations connected with privatised firms, especially damage to the environment caused in the past, was also legally amended in the process of privatisation. However, it will be necessary to amend the process of settling this damage by a generally obligatory norm.

In preparing further regulations of environmental law, it is necessary to take into consideration their future impact, to try to make the regulations real and so able to be implemented, applicable in practice and to create not only the economic and political, but also the social preconditions for it. One of the ways which can bring this aim nearer is the involvement of the expert public and the business world in the preparation of new legal norms.

The Law as a Tool for the Transformation to Sustainable Development

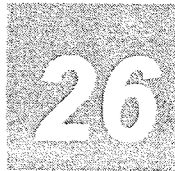
It is not easy to imagine what the legal regulations that would be based on the principles of sustainable development, should be. The law is, to a great extent, based on existing social relationships.

The law is one of the basic tools of ecopolicy. Its main goal is to ensure the improvement of the state of the environment, to protect the environment and natural resources against pollution, damage and wasteful use.

It is necessary to understand this basic task of the law in a somewhat broader sense. It cannot carry out only narrow pragmatic goals resulting from the reconstruction of economic mechanisms, changes in the structure of the economy in the post-totalitarian period and changes in property relations. On the contrary it is necessary to understand the law as a way of defining new values, resulting from a gradual understanding of the importance of nature, the environment and natural resources for the existence of man, human society and culture. In this way through the law, a new historical paradigm, in which nature will become a respected and conditioning value, will be defined. At the same time, the framework for the influence of economic activities and mechanisms will be formed.

Czech law at present is and will increasingly be influenced by certain circumstances that will fundamentally determine its shape:

- global problems and the responsibility of individual states (e.g. the threat of climatic change, the thinning of the ozonosphere, acid rain etc.) defined by the world community;
- regional problems and regionally defined responsibility (in the case of our republic above all the question of reducing SO₂, NO₂, CO, the disposal of dangerous waste, the regime of protected areas);
- national problems and interests;
- local problems and interests.



The task of the law in the environment will be also to objectively determine the orientation of ecopolicy. Ecopolicy is a set of measures by governments, parliaments and environmental ministries, that provides or facilitates solutions to the problems of the environment and natural resources. In a long-term perspective, ecopolicy should be directed towards the establishment of the relationships of sustainable development and to the application of its principles. The legal regulations, economic tools and organisational measures need to be considered as basic tools of ecopolicy.

It is possible to expect that national legal systems, including Czech law, will be substantially influenced by the documents adopted at the UN conference in Rio de Janeiro in 1992, especially by the Rio declaration and Agenda 21. But also such documents as the Earth Charter will be of basic importance for the development of the law of the environment and the protection of natural resources.

Therefore it is evident that in environmental law the following facts will be stressed: the keeping of the precautionary principle, the preservation of biological diversity, the preservation of the values of the environment and natural resources, the preferential treatment of long-term, sustainable development compared with short-term special interests, the avoiding of irreversible damage to the environment, the participation of the public in making decisions about the problems of the environment, the prevention of damage caused to other nations and the Earth as a whole, information and the preliminary evaluation of risks to the environment, including risks which extend beyond state borders, international notification and help when necessary in questions of the environment, the peaceful solution of disagreements connected with the environment, the processes for stopping and compensating for damage to the environment which extends beyond state borders.

Many of these principles will undoubtedly be reflected in the constitutions of individual states. In the Czech Republic, the questions of the environment are not laid down in the constitution in a proper way, especially as far as the following points are concerned: the duty of the state to ensure the postulates of sustainable development, the guarantees of everybody's right to such an environment, that would be in agreement with the demands of the healthy physical and mental development of the individual, and the guarantees of the application of the right to information about the state of the environment and ways of improving it.

Recently the development of environmental law itself in the developed states has been heading towards the formulation of unified codexes for the protection of the environment. It is necessary to formulate basic valid principles both for the individual components of the environment and for the set of regulations as a whole. This general part should be followed by legal regulations for the protection of individual components of the environment subordinated to these principles.

Even where long-term development is concerned, it is necessary for the system of regulations of environmental law in the Czech Republic to result gradually in a similar legislative amendment.

Environmental law in the form of a codex should, above all, define the main concepts that environmental law uses. Besides the concepts mentioned in current law No 17/1992, this concerns concepts such as "the sources of pollution", "biodiversity", "substances", "ecological accident" and "economic feasibility".

26

It will also be necessary for the law to amend, besides the principles laid down in current environmental law, further principles, with the help of which the protection of the environment and the economical use of natural resources must be controlled. The following principles especially should be concerned: the precautionary principle, the principle of the preliminary evaluation of risks, the preferential treatment of long-term sustainable development compared with short-term special interests, the participation of the public, the right to information and access to it and also the principle of prevention, the protection of biodiversity and others, such as the principle of the originator, the consideration of influences on the environment, the principle of cooperation, the integrated protection of the environment and the responsibility of the state.

We consider the last principle especially to be very important. In the Czech constitution, the duty of the state to protect the environment and natural resources is not very clear and explicit. At the same time, undoubtedly, in the field of the protection of the environment (similarly as e.g. in the field of education and health services) it is the state which must guarantee the condition of the environment and the basic values of nature.

Besides this, the law will have to amend the basic mechanisms and tools that are common for the whole area of the protection of the environment, such as planning, monitoring, the evaluation of the influence of activities on the environment, administrative control and decision-making and environmental management. Also the field of responsibility, the basic definition of the tasks and the range of public management bodies need unified legal amendment.

Another part of the law should amend the protection of individual components of the environment. It will be necessary to start from the demand for cross-media management. Two arguments gave rise to this method of protection: first of all the protection of individual components (media) of the environment against individual types of pollution is not effective enough, because the polluting substances go from one medium to another. Then, it has been proved that in this way the protection of media is more expensive because each of them is protected separately and each type of pollution is treated individually only when it is found.

Around the world the legal amendment of the methods of the protection of the environment, with a specific emphasis on the main types of pollution, the control of main sources of pollution etc. according to region, is also beginning to be applied. This method has not yet been used in practice in our country.

In the protection of the individual components of the environment, and especially of natural resources, it is possible to expect an increase in conflicts between the traditional understanding of property rights and the postulates of sustainable development. The classical legal definition of ownership as an unlimited rule (power) over a thing is not valid any more in modern society and it will be even less valid in the situation of a threat to resources caused by their uneconomical exploitation. In this connection it is necessary to point out the German theory of ownership as "a social function", with the help of which the theory tried to face the social pressures after World War I. It meant that ownership should be used for the benefit of a wider whole, it should not serve the exclusive interests of the owner. The above theory was reflected in the constitution of the German Federal Republic after World War II.

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In a similar sense it would be necessary to develop the theory of the "ecological function" of ownership. Today the Bill of basic rights and freedoms already includes provisions for certain limitations of these rights in the interests of the protection of the environment. The constitution should explicitly express the idea that nobody is the sovereign lord of the natural resources that they own. Property rights have to be exercised in such a way that the environment and natural resources will not be endangered or damaged. The owner is obliged to accept the limitations on the enforcement of his property rights that are necessary to ensure the protection of ecosystems, ecological stability, the variety of plant and animal species etc.

This is especially true where the protection of so-called life-supporting systems, such as meadows, wetlands, forest ecosystems, arable soil etc. are concerned.

It will be necessary to define more explicitly the role of town and country planning as a tool of the protection of the environment. Above all, it will be necessary for town and country planning to be back under the control of the department of the environment where it can fulfil its function in a much more effective way. The legal amendment of town and country planning should define the conditions for the orientation of economic and social activities to prevent further damaging of the landscape and naturally valuable areas. Similarly, rules should be laid down which would govern how the improvement of the environment should be carried out in the affected regions, especially for the restoration of destroyed life-supporting systems, such as forests and meadows in the mountain regions. The law should, in agreement with the law on the protection of nature, determine the conditions under which economic development will enable the preservation of the natural balance in individual areas and especially the conditions for the creation of systems of ecological stability, above all in areas with intensive agricultural production.

We have already mentioned the need for the participation of the public in making decisions about questions of the environment. The report to the Club of Rome, called "The first global revolution", states, that "...the form in which democracy is practiced today is not suitable for the tasks that lie ahead of us.". The report then says, that the representatives of industry, trade, research institutions, scientists and non-government organisations will have to take part in the creation of the future world.

The increased cooperation of the above-mentioned subjects with state power in decision-making will be more necessary than before. It is also necessary to assume that regional measures will be more important, but they will have to be of a global character.

It is already clear today that the constitutional system based on the sovereignty of individual states is a brake on the development of regional cooperation (e.g. Northern Bohemia, the southern part of Saxony and the south-western part of Poland).

The aim of the law will be to define the reasons for and the forms of the participation of these various subjects in decision-making, the possibilities of initiating law-making, the duty of the state authorities to consult these subjects in assigned cases etc.

In this connection it will be necessary to modify the form of "hearings" with these subjects, or their representatives, before specialist representatives of law-making

bodies, especially before committees dealing with the problems of the environment. The transformation of these committees into committees for sustainable development would be acceptable if their corresponding competence was defined.

Knowledge about the environment is closely connected with participation in decision-making. On the level of municipalities it will be necessary to amend legally the duty to publicise the facts about the main polluters in a municipality and to regularly report on the state of the environment, accepted measures and time perspectives, in which the improvement should be completed.

The outlined tendencies and trends of the further development of environmental law are of a long-term character, they concern development in the next approximately ten years. The introduction of these tendencies and trends is, however, clearly completely conditioned by a change in the general atmosphere in society - towards the understanding of the necessity to deal seriously and consistently with the problems of the protection of the environment as a factor conditioning further economic and social development in this country in the sense of the demand for sustainable development.

The Security of the State and Its Inhabitants

Basic Description and Problems

Human society developed through the specialisation of individual activities and in this way there appeared groups of people who devoted themselves to certain activities. Because it was completely uneconomical and ineffective for everybody to do everything, there appeared groups of people who protected the others against the raids of enemies (the army) and groups of people who protected the others against the thieves and murderers inside society (the police). The existence of such groups in fact enabled the functioning of society, especially the organised structures which evolved into an association of people - a state.

Practically all known societies respect the inviolability of property, which represents a basic corner-stone of their functioning and so the police in fact, by the protection of personal possessions, protect the social order.

In the U.S.A. the police remain basically regional - established and financed by regional or local authorities and they are also responsible to them (city, county, or state). On the central level there are only several specialist agencies (the FBI, the DEA etc.), while in Europe originally town and trade police quickly changed into a centrally controlled police force and more closely resembled the army (a constabulary organised in a military manner).

After 1948, the structure and functioning of our police were adjusted to the soviet model. One result was that the State Police - the StB - (the police within the police) was the most powerful section; at a lower level the other policemen too had a feeling of omnipotence and superiority. The inhabitants stopped feeling the protective function of the police and they were definitely felt as an arrogant tool of communist power. In spite of this, the security of the inhabitants was paradoxically

KNOWLEDGE ABOUT THE ENVIRONMENT IS CLOSELY CONNECTED WITH PARTICIPATION IN DECISION-MAKING

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PRACTICALLY ALL KNOWN SOCIETIES RESPECT THE INVIOABILITY OF PROPERTY

quite well-assured (with the exception of state violence - frame-ups, the criminalisation of dissidents etc.) as a result of the Iron curtain and strong police control (the detriment of the rights of individuals).

The Changes after November 1989

With this heritage the police entered a period of returning to a free and democratic society, which means for the police the restoration of their original function: the protection of the rights and freedoms of individuals, their physical and mental integrity and the inviolability of their possessions.

The abolition of the political police - the StB - was the first step. The next step was legislative amendments, directed towards the humanisation of the police and more effective assurance of the rights and freedoms of citizens. From the viewpoint of assuring the security of the majority, it is possible to discuss whether there was "a pendulum effect" - the assurance of human rights to such an extent that it makes the protection of others against the abuse of these rights by some individuals difficult. In this connection it is interesting that today we can sometimes be witnesses to a discussion in western countries as to whether the citizens would be willing to abandon some of their rights (and to what extent) in exchange for an increase in security and a decline in the crime-rate. The fact that in the U.S. - the country traditionally well-known for its high level of industrialism and the protection of the rights of the individual (including the right to protect themselves) - the crime-rate is one of the highest in the world is also remarkable.

Besides the positive changes in our police, it is impossible to forget that the structure of the police, inherited from the past, has been preserved: it is still a centrally controlled and militarily organised corps, secret and closed towards the public. Also the bureaucracy required by the criminal code makes it necessary to compile only slightly less thorough records for a misdemeanour than for a felony. The process of the investigation, the working out of the indictment and the trying of a case of murder is nearly the same as when a stolen bicycle is involved.

This paperwork limits the functionality of the whole system and with the increasing crime-rate it is slowly leading to the blocking of the system. The centrally controlled police still makes its political abuse possible. Only the superficial and ostensible "depoliticisation" of the police, such as the prohibition against all policemen being members of any political party or movement, has been implemented.

Similarly, nonsensical communist economic and budget rules - such as the strict compartmentalisation of finance resources, the impossibility of transferring money from one year to the next, anti-market and demotivating rules valid for state-funded organisations - have been preserved.

But there is also the general public, which on one hand still views the police as something which serves to suppress and not to protect them, while on the other hand it is panicking at the explosion of a still increasing crime-rate. As a result of this it is slowly beginning to realise its priorities and the assuring of security is becoming very important. In this way, the awareness that we need the police is

27

WE CAN SOMETIMES BE WITNESSES TO A DISCUSSION IN WESTERN COUNTRIES AS TO WHETHER THE CITIZENS WOULD BE WILLING TO ABANDON SOME OF THEIR RIGHTS (AND TO WHAT EXTENT) IN EXCHANGE FOR AN INCREASE IN SECURITY AND A DECLINE IN THE CRIME-RATE

THE PERCEPTION OF THE ROLE OF THE POLICE FROM A REPRESSIVE FORCE TO A PROTECTIVE FORCE IS SLOWLY CHANGING

27

being born and the perception of the role of the police from a repressive force to a protective force is slowly changing.

Unfortunately, the increase in the funds expended on the police hardly corresponds to the rise of inflation and it does not, by any means, bear any relation to the growth in the crime-rate.

The Present State

Comparison with the north-american and western-european democratic countries leads us to the thought that, in a civilisation of our type, the crime-rate is the price we pay for freedom and democracy, and we can only speculate on the factors and mechanisms through which it happens. Undoubtedly the break-up of traditional structures and relationships, such as an increase in the divorce-rate and the loosening of family connections, will be among the factors. It again makes children less resistant towards negative influences from outside. Among them there is the influence of the brutality and violent scenes absorbed from television and video. Centerwall (JAMA, October 1992, p. 30 -34), on the basis of epidemic studies, shows that, after the introduction of television over the course of 10 to 15 years, the number of murders doubles, e.g. in the U.S. 10,000 murders are committed every year as a result of the introduction of television. So it is possible to assume that something similar will happen in the next ten years in our country (brutal violent scenes began to be available only after 1989 - mainly on video, in the cinema and partly also on television).

The sharp increase in the criminal activity of children and youth is alarming - in the course of five months of 1993 it was nearly 25% of total cleared up crimes (for comparison: in 1990 this proportion in Czechoslovakia was 10%, in the German Federal Republic 15%).

In 1991 the number of crimes increased by 66,000 in comparison with 1990, in 1992 by another 62,000 and the growth in the first five months of 1993 was 27,000 crimes (i.e. 20% more than in 1992), which shows the increase for 1993 to be 65,000 crimes. So in 1993, 410,000 crimes were committed in the Czech Republic in comparison with 216,000 crimes in 1990 (i.e. nearly double).

Today we can expect the development of as yet not too widespread forms of crime.

Since the opening of the borders in 1990 our country has become a transit route (part of the Balkan drug route). Similarly, various groups of international organised criminals (Italian, Chechen, Georgian, and Chinese) have appeared in our country.

Also the fact that a considerable part of organised crime takes place in a hidden form (economic crimes - the laundering of dirty money, for which in the Czech Republic there are especially good conditions, smuggling drugs, arms, explosives, radioactive material etc.), is extremely serious. In most cases there is no injured party that would report the committing of a crime. So it is a criminal activity, which is not accompanied by any obvious signs to which the police can react and so it does not appear in the statistics of committed crimes.

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27

At the same time, because some strata of society have become affluent, our country is beginning to be important not only as a transit route for drugs, but also as a drug market. (According to some american sources, in american prisons today 70% of prisoners have been sentenced for an offence which is somehow connected with drugs.) Besides this, petty crime will increase in connection with the growth of the unemployment rate.

In the field of crime against property, the number of car thefts is increasing sharply (in 1992 it was 92% more than in 1991). There are more car thefts in all European countries and the Czech Republic is, among other things, a transit territory for the transport of more expensive models of cars from a western country to a third country.

We can assume the development of so-called white collar crime, which means primarily economic fraud such as tax fraud, fraud in obtaining a subsidy, credit fraud, fraud in capital operations, insurance fraud, exchange fraud and the establishment of fictitious firms. Another group will be offences against economic competition, such as unfair competition, economic espionage, unfair advertising, trade libel, breach of patent right and copyright, and also the laundering of dirty money.

Very often there will be crimes breaching economic fidelity, including especially defalcation, the abuse of powers and authorisation, the active and passive corruption of employees, providing unauthorised advantages to a rival or the paying of unauthorised salaries.

Even much more serious crimes against economic regulations will be more frequent. They will be especially foreign currency crimes, crimes connected with share trading, crimes against the functioning of financial institutions and insurance companies, against trade regulations, against the keeping of accounts and accounting. So-called insolvent crimes, consisting especially in pretending bankruptcy, in taking advantage of debtors and creditors, and in machinations with property threatened by distraint, will increase.

Also crimes against the labour laws (especially the illegal finding of jobs and illegal trade with labour) will increase.

The spread of computer crime, both direct and indirect, is expected. Direct computer crimes include the illegal production of computers, the copying of programmes, the unauthorised use of the results of computer analysis, the destruction and damaging of computers and programmes and the unauthorised obtaining of information from databases. Indirect crimes include putting false data into computer systems, the change of the results of computer processed data and the changing of programmes.

With organised crime the increased use of violence will appear. Armed robberies of financial institutions and security vans carrying money and other valuables, the demanding of "protection" money, murders to order and other violence will take place more frequently.

WE CAN ASSUME THE DEVELOPMENT OF SO-CALLED WHITE COLLAR CRIME, WHICH MEANS PRIMARILY ECONOMIC FRAUD

THE SPREAD OF COMPUTER CRIME, BOTH DIRECT AND INDIRECT, IS EXPECTED

The number of already known forms of crime, such as the forgery of documents, cheques, money and coins, thefts, the burglary of flats, cottages, shops, stores and business premises, will increase. The thefts of art and collector's items and their illegal export abroad, car theft and the hijacking of lorries to steal their loads will continue. On an international scale the receiving of stolen goods will also spread.

According to present analyses there are only about 4,000 policemen on the beat and another 3,000 policemen in border and immigration service (as a result of the newly established border with Slovakia and the expected flood of refugees).

The December 1991 law concerning municipal police tried to solve the problems of too great a workload and the insufficient number of policemen. From the viewpoint of the optimal use of labour and funds, the establishment of municipal police is not however effective, because costs for a municipal policeman are about the same as the costs for a Czech state policeman. At the same time, a municipal policeman is not so well-trained and has less power (practically only in the field of public order).

Only from one point of view is a municipal policeman in a better position - money collected for fines goes into the municipal fund, so it is possible to use it again for the municipal police if need be.

Experienced policemen leaving police service is a certain problem. Considering the fact that a man becomes an experienced policeman, able to work independently, after three to five years (i.e. on the beat, an experienced detective needs another two or three years), there is a real fear that the police force will have an absolute majority of young, inexperienced policemen, with all the resulting consequences for the quality of work and results.

Trends and Problems

From the above it is clear in which direction the likely development in the near future will go. The crime rate will probably continue to increase, the number of policemen and the funds for the effective fight against crime will increasingly lag behind the growth in the crime rate. At the same time new forms of crime will appear.

The financial capacity of these gangs will be a considerable problem, because with a turnover of tens of millions it is not a problem to put away hundreds of thousands or even more to obtain informants among the police, the prosecutor's office and judges, not to mention counsel. This would then paralyse the activity of the police, whose activity would continue to be concentrated only on the fight against petty crime. In a long-term perspective, it could lead to the growth of crime through the state administration and to the situation that is typical for Italy.

Also the expected flood of refugees from the East and the Balkans and the resultant strengthening of racist attitudes in some groups of inhabitants is a potential danger. It is an important factor from the viewpoint of the crime-rate, because a large proportion of these people are financially less well-off and with the expected increase of unemployment their chance of obtaining money legally will be very limited (as it is today with Romanians, among whom, according to some data, there is 60 to 70% unemployment). E.g. today in the FRG crimes committed by

foreigners constitute nearly 30% of cleared up crimes. In other words, foreigners proportionally commit at least four times as many crimes as the native population.

Many necessary legislative amendments in many fields will call for a considerable effort.

It is necessary, according to the example of western countries, to simplify considerably the administration of less serious crimes. E.g. in Austria the police investigate a property crime only when the damage caused is higher than the estimated costs for clearing it up. In this way the pocket of the tax payer is spared.

In connection with legislative amendments it would be desirable to introduce, for some kinds of crime, the forfeiture of property (e.g. in the U.S. this is successfully used with drug smugglers and middlemen - at the same time the court has the possibility of giving a part of the forfeited possessions to the police).

Today the police, as a state-funded organisation, hand in all their income (fines, rents, insurance payments for accidents to service cars etc.) to the state. This may be because there is a hidden concern that if the police could use a part of these funds for their own needs (the purchase of technical equipment - communications equipment, computers, cars etc.), they would be tempted to fine specifically "to earn money". However, as experience shows with the functioning of municipal police even from abroad, these concerns are quite exaggerated. Even here there would be a certain way to get further funds for assuring the security of the citizens. Another possibility is an amendment to the tax law, so citizens themselves can decide, for what field they will give a part of their taxes (security, health care, the system of education, the army, social insurance etc.)

But because there will never be enough finance, it is necessary to increase the effectiveness of the functioning of the police and to bring it closer to the citizens.

To make the work of the police more effective and to bring them closer to the inhabitants, it would be necessary for the centre to delegate a part of its power of assessment to regional authorities (both local authorities and state administration) or enable them to participate in financing the police. But there is a strong psychological barrier, because no superior will give up a part of his power over subordinates with pleasure.

All the departments of the police in a given area should be subordinated to the area commander (who after all is responsible for the security in a given area and so he should have this power) and the centre should keep only co-ordinating and legislative functions.

Another kind of relic from the past is often nonsensical secrecy, totally incomprehensible from the viewpoint of western democratic countries.

Crime prevention is another important field to which it will be necessary to pay considerable attention in the next few years. Prevention is much cheaper than dealing with committed crimes. It is, however, a long-term problem - if we could now start extensive preventive programmes, we could expect the first results after five or ten years.

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The capacity of prisons is beginning to be a critical problem. Today the capacity of our prisons (about 18,000 places) is overcrowded. There are several possible solutions - alternative punishments lasting several weeks or months (and at the same time the establishment of municipal magistrates, who would decide these punishments in a shortened court procedure - in this way the present disproportionately long interval between the committing of a crime and the carrying out of the punishment would be shortened), the construction of new prisons, or the amendment of regulations so it would be possible to increase the capacity of present prisons (which is, however, only a temporary solution).

As far as the situation in prisons is concerned, it is certainly right that the humanisation of penology has taken place. But the question is, whether even in this field there has been a "pendulum effect". It is a grave matter, when some offenders admit that they commit crimes because in prison they live in better conditions than when they are free. Today there are some prisons (however, not by a long chalk all of them) equipped better than many army barracks. It is stated that, in our country, about 120,000 families live on the poverty line. Then it is a injustice that these people in fact from their tax help to pay for offenders to live in prison often in better conditions than when they are free and they do not have to work. It is surely necessary to respect the basic human rights of sentenced offenders and their human dignity, but material conditions should be slightly worse than the conditions of those who live outside on the poverty line.

If effective measures are not very quickly accepted, the police will become only a recorder of committed crimes, because there will be nobody and no means to clear them up effectively. And if in the end a crime is cleared up, there will be nobody to prepare the case for court and nobody to prosecute the case, and even if in the end an offender is sentenced, there will be no room to put him in prison.

National Security from the Viewpoint of a Sustainable Way of Life - Values and Human Rights

If we are supposed to analyse the security of inhabitants from the viewpoint of a sustainable way of life, we must start from the very fundamentals of the functioning of the state and the values on which the present democracy is built. The relationship of man to society, the relationship to the sense of his own life and the relationship to freedom and responsibility are important. Vavroušek's formulation of a sustainable way of life as a constant search for the balance between the rights and freedoms of each individual and his responsibility towards other people, society and nature as a whole is especially fitting in the field of security. When looking for a balanced position, it will be necessary from this point of view to revise the so far accepted humanist ideals, both from socio-biological and cultural-historical points of view (the Judaeo-Christian tradition). The present development of Western culture indicates that the application of human rights as widely as possible is self-contradictory. E.g. the wide application of the right to banking secrecy conflicts with the right to assure security, property and health.

The ideals of human rights and freedoms start from a certain idea of a human being and after the realisation of these ideals it is shown that they are accompanied by the corresponding personal maturity of people, especially as far as responsibility for their own lives and their relationships to other people and society are concerned. The result is an increasing abuse of these rights and freedoms that starts gradually to threaten the whole of society (the crime-rate, organised crime and terrorism). This is a general trend, visible from about the middle of the 20th century - the crime-rate is highest in the countries where there is the most extreme stress on competition and the individual. On the contrary, the second extreme - the stress on collectivism and a totalitarian system of government leads to a lower crime-rate, but it has other disadvantages, familiar to us from the recent past.

The perfect example of this contradiction is the development in the Czech Republic - from totalitarianism with a low crime-rate to the scrupulous observance of the human rights of the accused - to such an extent that it is to the detriment of the rights of the victim of the crime. Again it is an extreme reaction to the breach of human rights in the period before November 1989.

The balanced emphasis on the individual and the collective, the development of the awareness of belonging to a community, love for people, solidarity and altruism are an alternative to this contradiction. The question still is, where this point of balance is in the field of security. We think it is not possible to determine it by theoretical considerations, but it is given by a certain agreement between the inhabitants and the police (i.e. the state) - to what extent they are willing to allow the police the limitation of their rights to reach a desirable level of security.

The problem is closely connected with the values which are connected with the relationship to freedom and responsibility. Our Euro-american civilisation puts a one-sided emphasis on human rights and freedoms, the question of responsibility (i.e. the ability to accept the consequences of our own actions) is somewhat neglected. Nevertheless, human rights are a human creation and therefore it is a question of the subjective feeling of every individual what he regards as human and inhuman. E.g. we a priori reject corporal punishment as inhuman.

It might be worth investigating where our deep-rooted conviction that corporal punishment is inhuman comes from. The majority of parents consider a slap totally normal with children. Are children human beings less deserving of respect than adults? Does not an adult who commits a crime show a certain immaturity of personality and irresponsibility, which makes him appear like a child in a certain direction? In other fields we paradoxically tend to treat adults as children - as if they were not responsible for their actions, as if their primary family, society, gang etc. was responsible. We speak about re-education, even if the experts know how complicated, difficult and unlikely it is to successfully re-educate an adult. And at the same time we do not deny even children the responsibility for actions whose improper character they are able to understand and so we punish them. From this point of view, would a trashing not be much more "educational" than several months in prison (that often serve as a school of crime)? And that is without mentioning the economic aspects and the overcrowding in prisons, where today their capacity is exceeded by 2,000 at the cost of exceeding the norm of 3.5 m³ per prisoner.

Let us go back to the above-mentioned agreement between the inhabitants and the state (the police). According to surveys of public opinion it seems that, if the agreement were today really concluded according to the majority of the inhabitants, it would mean a considerable shift towards a higher level of security at the cost of a certain reduction of rights and freedoms.

The Role of the Police - Prevention and Repression

We consider the decentralisation of the police, including the possibility of the greater influence of state, regional and local authorities, to be one of the fundamental steps towards gaining the trust of the inhabitants. The unity of the police should be assured by the fact that they follow a single criminal code rather than that they are controlled from the centre.

At the same time, decentralisation could help to change the view of the police as an exclusively repressive organisation. It is necessary to realise that the repressive function of the police is realised only towards 3 or 4% of citizens who commit crimes. Towards the rest of the population the police fulfil a protective or service role.

Let us have a look from this point of view at the concept of a "police state" as the opposite of a legal state. Is it a question of the powers of the police? Even if the police had much greater powers, but used them only in the fight against crime, it would be no detriment to our citizens (e.g. phone tapping allowed only by a counsel for the crown on the basis of the suspicion of a crime is no detriment to any citizen if it is guaranteed that information obtained will not be revealed to the public). Is it a question of the number of policemen? No, on the contrary the public calls for a larger number of policemen on the streets, which with present numbers and workload with many crimes it is not possible to realise. If the number of policemen theoretically doubled, in a town with 10,000 inhabitants during the night there could be not one, but two patrols. Considering the inhabitants' confidence in the police, it would result in both a psychological feeling of greater security among citizens and a likely decline in the crime-rate, because only the presence of a policeman on the street has a preventive impact (especially against street crime).

So the police state is not determined by the number of policemen nor their powers, but always by the purpose which the police serve, by a check on the possible abuse of power. If the police serve to protect citizens against offenders and the check is consistent, then even if the police have unlimited power it is not clear that it is a police state. E.g. Singapore: "Here nobody dissects an offender's unhappy childhood or his momentary frustration. The police can order anybody to submit to a drug test immediately. If it's positive, then it's straight into jail with him for three years. In the U.S.A. the police, even less so a teacher, are not allowed to check pupils' satchels to see whether they have brought a Colt with them to class", said one western diplomat to the newspaper U.S.A. Today. At the same time, Singapore is a country where the crime-rate 30 years ago was nearly at the same level as it is today in the U.S.A. The authorities started to use severe punishments which were promptly carried out. Today Singapore is one of the countries with the lowest crime-rates in the world.

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From the development in western countries it is clear that further changes in police work will take place in two directions - on one hand in closer cooperation with the public, on the other hand in a greater emphasis on serious crime and organised crime. It means that, in the fight against (and the prevention of) petty crime, there will be the increasing involvement of local bodies (local authorities, action groups from the health services, education and citizens generally - in many countries, citizens are directly involved, acting in a sense as voluntary policemen). These bodies concentrate to a great extent on prevention, because it must start from the bottom - from the observation of problem families and children, the support of voluntary citizen's activities etc.

Also a change in attitude towards drugs is a part of this trend - e.g. in the FRG they came to the conclusion that, if somebody uses drugs, it is not a police matter, but a health one. It becomes a matter for the police only in connection with the question of where they got the money and who sold them the drugs.

Also efforts to eliminate the negative influence of the mass media, mainly on young people, is a part of prevention. It seems that it will be necessary to introduce a certain form of legal restriction, something like today's article No 205 of the criminal code concerning the threatening of morals.

Even today there can be heard voices calling for the limitation of violence on television, video and films. In this connection, the question of lowering the age limit for criminal responsibility is worth mentioning - e.g. in England an offender is criminally responsible from the age of ten. With the present trend, when the crime-rate of 13 to 17-year-old children is sharply increasing, it would be highly desirable because these offenders are difficult to deal with, especially if they come from problem families, where parents are often without permanent income.

Family upbringing plays a basic role in the prevention of crime. In a positive case it is the best prevention, in a negative case on the contrary a basic pathogenetic factor. It is possible to divide young offenders into two groups - on one hand children from problem families, where parents often have a criminal record and children are a problem from school age, on the other hand children from so-called "decent" families, who suddenly surprise everybody by committing a crime.

With the first group the timely identification of these problem families (and groups) and prevention programmes are useful, the second group remains a problem.

In the increasing crime-rate of the second group a considerable role is played by the present value orientation, particularly the group of values which is marked by Vavroušek as the relationship to the sense of one's own life; he marks the variant prevailing in present-day culture as a hedonistic orientation and a consumer way of life. Especially in upbringing it manifests itself in parents satisfying the material needs of their children to the extent which is allowed by the financial situation of the family. One result is that children get used to the fact that the overwhelming majority of their wishes are satisfied, without exerting any corresponding effort. This, however, results in further negative consequences - on one hand it lowers the joy and satisfaction (because the psychological law, that the greater efforts a man must exert to reach a certain thing, the greater subjective satisfaction from its reaching he feels, is true), on the other hand it leads to the (even unconscious) awareness that this individual has a right to get what he wants. If it is later not

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possible, he perceives it as an injustice and he loses all inhibitions against crime, because according to his feeling he is only getting rid of the injustice.

The Role of Punishment

It is possible to see the sense of punishment from two points of view. On one hand as the fulfillment of justice (punishment re-establishes the balance which has been broken by a crime, guilt and punishment must be in agreement, the extent to which a punishment can be given must be in accordance with the extent of the crime), on the other hand as education (the reforming of a criminal), or prevention (the protection of society against the further crimes of an individual and the potential warning to others).

The first point of view has been advocated by the majority of important thinkers in the history of mankind (e.g. Aristotle, Thomas Aquinas, Kant, Hegel etc.). They started from the understanding of man as a non-certifiable person who, on the basis of his inner freedom, is able to responsibly determine his behaviour. The core of this attitude is the point of view that the illegal and unlawful behaviour of a free and sane citizen deserves punishment, through which justice, which has been infringed by a crime, is fulfilled.

The second attitude starts from empirical psychology, which denies self-determination on the basis of free choice and, by the deterministic and mechanistic understanding of human motivation, in fact cancels the concept of guilt. This theory was developed most in marxism and socialist law, where guilt was shifted from the offender to society, education and the group etc.

Kant completely rejected this theory and said that punishment inflicted by a court can never be inflicted only to benefit the criminal himself (reform) or for civil society (protection and deterrence) but it must be inflicted on him simply because he is guilty, that he was found deserving of punishment. Through a just punishment a criminal is acknowledged as a responsible and sane person. Those who consider an illegal act as a psychiatric illness or as a socially conditioned result of alienation, do not accept an act as human behaviour and a criminal as a man. Kant asked: does the democratic legal state assume that law and order consider the citizens of the state as mutually equal with each other, as adult, responsible and sane persons?

Present research shows that the re-education of an adult is a difficult, complicated and long-term process that must be done on a high expert level by a team of psychotherapists and even then it is only successful sometimes. In prison it is successful with approximately one in a hundred (with first time offenders), with the other ninety nine, prison is on the contrary a school of crime.

To look at punishment from the viewpoint of its intended effects (e.g. "resocialisation") means to consider a criminal as a being who is not responsible for his crimes, "ill", socially determined and therefore standing outside the category of good and evil. Behind this pseudoscientific argument, however, an antipathy towards taking unreserved responsibility for the proper punishing of a criminal, that

should result from the fact of committing a crime, is hidden. This unwillingness to take responsibility is noticeable even behind the opposition to capital punishment.

(However, because the death penalty has many serious pros and cons, a life-sentence, but with the possibility of capital punishment as "a last resort" if another serious crime is committed in prison, could be an alternative. It is important for such people to have hanging over them the threat of a "final" punishment, otherwise they have nothing to lose in prison and they could tyrannise with impunity their fellow-prisoners and threaten warders - a note by P.N.)

When punishing it is, however, necessary to weigh up whether prison alone can always be a punishment. Prison should be reserved for serious crimes and for other crimes we should consider the possibility of the introduction of alternative punishments - from house arrest through town lock-ups for punishments up to one month (where a municipal magistrate would make decisions) and work for the public benefit, to large fines (graded according to the property of an offender), or the distraint of disposable property (the possibility of corporal punishment would probably meet too strong a resistance from the general public). In many cases the partial loss of property (fines are, from certain strata of society, totally uncollectable) could be a much more sensible punishment for an offender than several months in prison.

The effectiveness of a punishment is often reduced by the long period which passes between committing an offence and the beginning of the punishment. The punishment that an offender starts to serve e.g. after two or three years practically loses its connection with the crime committed, irrespective of the fact that many offenders in the meantime will commit further crimes.

Almost total neglect of one of the basic rights of the victim, i.e. the right to adequate compensation, is in contradiction to the emphasis put on preserving the human rights of offenders. Unlike democratic legal states, the Czech Republic still continues the pre-November 1989 tradition, in which the obtaining of compensation was a private civil and legal matter for the victim of a crime. In western countries the state gives the victim financial compensation and takes over the burden of demanding debts from prisoners.

Summary

Where the protection of society against crime is concerned, a critical investigation and possible revision of the basic value orientation of present western culture is necessary for a sustainable way of life. It means to correct the balance from a one-sided emphasis on human rights towards equilibrium with the responsibility of the individual towards others, to find a balance between the emphasis on the individual and the emphasis on the group, and to reduce the constant search for higher material consumption towards an emphasis on conscious self-denial and self-limitation. This self-limitation should be reflected (as an important factor in crime prevention) especially in the consciousness of most people involved in the education of the next generation, and maybe as well by voluntarily giving up certain peripheral rights, which are today useful mainly for offenders. E.g. it is highly probable that it would be no detriment to 90% of decent people if the police were

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given access to bank secrets (on the assumption that for policemen a breach of banking secrecy would be punishable in the same way as for a bank clerk). Practically only offenders would feel it as a detriment. It assumes, of course, that the relationship of the police with the public would be close enough that all honest citizens would understand that the police are there for them and that it is in their interests to have a strong police force, that a police state is determined neither by the number of policemen, nor by great power, but by whether the police are or are not subject to the law and checks. It means also to understand that the right of citizens for the protection of their possessions, health and life assumes the right of the police to information.

The trust of the inhabitants in the police is especially important with regard to the necessity to accept certain special measures for the fight against organised crime (e.g. the infiltration of police agents into criminal organisations, an agreement about the reduction of punishments for criminals who turn state's evidence, the simplification of the procedure whereby the police gain information with the help of operative means, etc.).

It is necessary to involve municipalities and state bodies (the system of education, health care and social care) in the effort to maintain law and order. The strengthening of the family as the most important element in crime prevention, together with a change in upbringing (the utility of self-denial and slight insufficiency), is an obvious element.

28

Education and Upbringing

Alternative Attitudes to Education and Upbringing

The state of the educational system and upbringing has been generally considered as unsatisfactory for many years. The structure of the education system has not changed fundamentally since the time of J. A. Comenius. The hierarchical structure of schools and the teacher-pupil relationship comes from the same structure of relationships between superiors and subordinates as exists in factories.

The growth of violence and vandalism, drug dependence, mental illness and suicides among young people has been considered to be a symbol of the notorious failure of school and educational systems in ethics all over the world.

The whole problem has become acute recently in connection with the prospect of the self-destruction of mankind due to insensitivity towards the environment. The tendency to minimise environmental problems, to ignore their seriousness or the inability to see these problems globally, that are often typical even for the people in the highest social or academic positions, is self-destructive in the same way as the growth of national conflicts, separatism and the spread of militant organisations, movements or sects.

It is almost absurd to want to find an alternative system of education or alternative ways of education that would be universally valid. We think that to speak about alternative systems of education has become fashionable and sometimes an emergency way out for those who took part in inauspicious school reforms in the past. Any authoritative introduction of efforts to reform a system of education will necessarily lead to their degradation. We are convinced that the only possibility is for everybody to look for individual answers to the world's problems, because these problems are a consequence and a projection of the problems of people themselves; and also the young generation especially should be encouraged to do the same.

The idea that science will find these answers for us is wrong. The institutionalisation of knowledge and the mythologisation of science created an illusion that greatly degrades people, because it has made them dependent on the fact that their knowledge is created for them, which leads to a reduction in moral imagination and responsibility. In fact it is a derangement of cognition which is caused by the illusion that the cognition of an individual is less valuable than "scientific cognition", that the individual's cognition is only the opinion of an individual, subjective and therefore second-rate in comparison with what an expert says and which is therefore "objective".

Books, magazines, computers are a part of the world, they can provide information when we use them, but if we emphasise the medium through which we obtain information rather than information itself, we shift the problem of learning and cognition into a blind spot in our intellect. People then stop trusting their own judgement and ask others to tell them the truth about what they themselves know. This destroys first their ability to make decisions of their own and to take responsibility, and later even the belief that they have such an ability at all.

We think that the only prospective acceptable future of mankind is in the kind of upbringing and education that gives people back their inner freedom and ability to make decisions conditioned by their own experience and own cognition. These demands can be fulfilled only by an education in which the relationship of superiority and subordination between teacher and pupil is replaced by an open process, in which both sides learn, in which there is a basic trust in the student as somebody who takes up an inquisitive position towards the world, who desires to form positive relations to others.

These demands can be more easily fulfilled by students and pupils than by teachers, because to approach students with such openness can only be managed by a teacher who himself is an integrated and emancipated personality. Therefore we consider the task of supporting such activities that develop self-recognition, self-acceptance, the depth of experience and the mental development of students to be the primary task.

Modern psychology starts from the premise that human development is in progress on a so-called psychomatic spiral, at one end there is alienation and the non-acceptance of generally accepted social values, at the other end creativity and spontaneity; at one end there is the degradation of people, which is the state when people consider each other to be a means for reaching their goals, they humiliate each other and try to exploit each other, at the other end there is humanity in a real sense, the sense of belonging.

28

THE
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EXPERIENCE SHOWS THAT EVEN IN THE ADMINISTRATION OF EDUCATION, PEOPLE WHO WERE SUPPOSED TO COOPERATE FOR MANY YEARS NEVER ACKNOWLEDGED EACH OTHER AS HUMAN BEINGS; THEIR NEGATIVE FEELINGS, THAT UNDERMINED COOPERATION AND PLANNING, WERE NEVER ACKNOWLEDGED AND IDENTIFIED; THEIR POSITIVE FEELINGS WERE ALWAYS CONSIDERED TO BE TOO DANGEROUS TO BE STATED.

It is possible to consider the lack of authentically human interaction as a basic reason for misunderstanding and mutual incomprehension, that often results in useless conflicts. Experience shows that even in the administration of education, people who were supposed to cooperate for many years never acknowledged each other as human beings; their negative feelings, that undermined cooperation and planning, were never acknowledged and identified; their positive feelings were always considered to be too dangerous to be stated.

An integrated personality, balanced as far as the physical, mental and emotional sides are concerned, is a personality open, not only in the field of interpersonal communication, but capable of empathy and therefore able to communicate with all organic nature and even with inorganic nature.

Ethics and Alternative Education

We do not see the basic task of alternative education in the reconstruction of systems of education from the formal or factual points of view, but above all in stressing the ethical component of education and in using psychologically well-grounded methods that enable the education of internally free people able to make decisions that are conditioned by their own experience and cognition. In the monetary market economy into which our republic is being transformed we, however, consider the following points to be essential for the first stage:

a) to complete as quickly as possible the centrally controlled reconstruction of policing and justice and in this way to complete the restoration of legal certainties and the feeling of security on one hand, on the other hand then the strengthening of the awareness that amoral behaviour, fraud and irresponsibility will be punished.

b) to loosen the central control of the system of education and to prepare financial conditions (tax relief etc.), so the quick development of alternative educational programmes, not only for children of school age, but also for the education of adults, could start; in this education programmes with ethical goals should be given an opportunity.

c) to assure an amendment in the Constitution so the principles of the protection of the environment will be included. It would also spontaneously bring about the development of alternative education and new attitudes towards the questions of life values and ethics.

Other questions deserving attention are connected with the development of compassion. People communicate above all with the help of movements, the expression of their faces and intonation, through which we understand the ideas expressed. When Socrates stated that it was not possible to learn a virtue, he had in mind especially that it is impossible to gain it only by the prescribing rules of a virtue, but above all by example, the embodiment of a virtue, that can help to share the virtue immediately. The precondition of such a sharing is however a certain level of suggestibility, that can be developed through play and children imitating adults.

Let us deal now with the possibility of realising an educational programme that would start from the above-mentioned theoretical considerations and develop them in practical applications.

The programme would concentrate, not only on work with children, but also on the participation of the family and other educational institutions in upbringing leading to pro-social behaviour.

The main emphasis is put on pro-social behaviour by which we understand behaviour aimed at helping or benefiting other people, groups or social goals, but without stimuli in the form of external rewards (money, approbation or acknowledgement). So the inner need or tendency to do what is useful for others must be the motivation of such behaviour; to develop such an inner need is a goal of this education.

We think it is necessary to develop a complex programme in the following aims:

a) the preparation of future teachers

Students at teachers' training colleges should now be instructed in methods of modern psychology. The first precondition of a successful teaching profession is that teachers themselves must be integrated and emancipated personalities. The results of this work will be shown after a couple of years, but they can have a much wider and deeper impact than a single reform "from the top", which would only be superficial.

b) the introduction of ethical education in schools

This stage could be realised first of all in chosen schools, later then as widely as possible.

c) the strengthening of ethical education in non-school institutions

- upbringing in the family should be primarily stressed;
- it would be ideal, if possible, to gain church support;
- the influence of the church could be very positive especially for the stimulation of co-operation with parents;
- organisations such as Junák (Czech scout movement) and various ecological activities, in which the component of quality of experience would be intensified, should be involved in the upbringing of children;
- the role of the mass media is irreplaceable. It would be necessary to get enough top-quality literature and organise cultural activities, which could also be an important factor in the stimulation to work on a new "green" Constitution.

The list of these stimuli cannot be complete, even if it would fulfil the role of basic stimulation material for a desirable transformation of the system of education so it would start to educate emancipated people, who are aware not only of their rights, but also at the same time are fully responsible for their behaviour and its social and ecological impact.

Upbringing and Education from the Viewpoint of Alternative Scenarios

The speed of growing global problems, both ecological and social, has greatly increased, and any institutional solutions have shown themselves to be so ineffective that the "wild card" scenario seems to be more and more likely. Also the scenario characterised as "the emphatic orientation of society towards sustainable development" (or a sustainable way of life) may be introduceable only if it is forced by a change in the quality of the consciousness of society, provoked by events of the "wild card" type.

Nevertheless we consider it useful to deal with upbringing and education. Our world is increasingly becoming an unbalanced system. In such a system changes in quality could be caused by quite small stimuli. These changes in quality could be desirable changes, creating trends leading to changes in the consciousness of the whole of society. It is necessary to pay attention to the possibility, no matter how weak and indistinct it may be, that each social group, even each individual under certain circumstances, can become such a starting mechanism of great changes.

What type of changes could be concerned from the viewpoint of upbringing and education?

Bateson (1979) considered three basic homeostatic systems, i.e. systems tending to keep a balanced state which people interfere in with their consciousness. These are man himself, human society and larger biological ecosystems. Human consciousness is a factor in the relationship between them.

There are three characteristic features of human consciousness:

- a) people have a tendency to change their surroundings instead of adjusting themselves to it. These tendencies appear also with lower biological species, but people have gone further in these tendencies - they have started to disturb biodiversity by creating one-species subsystems.
- b) with technological progress, the number of intentional changes in the environment, caused by specialised human activity, has sharply increased.
- c) purpose-orientated consciousness in the human mind has gradually separated from the corrective mechanisms formed in other parts of the brain, which have tendencies that are characterised by a global, holistic view of the world and the self-preservation instinct of a biological species. This tendency is especially striking thanks to the creation of social entities (clubs, political parties, trade and financial societies, nations etc.), that before the law have the status of a person, but biologically behave in a clearly purposeful way; this purpose is dehumanised and is controlled exclusively by the interests of such an entity.

It is evident that changes in the consciousness of a society (and in this way also in its attitude towards the solution of social and ecological problems) have to start from changes in the individual consciousness of people.

Among the factors that can be corrective there are especially the arts, love, compassion, contact with organic nature, religion etc. These are also the factors to whose development greater attention should be paid in the system of education.

As early as 1978, R. Higgins published these desirable tendencies in the form of demands for changes which should take place in the individual consciousness of people.

Our consciousness needs a change in seven aspects:

- a) it is necessary to accept the present situation with the feeling of a rational fear, not only for our own individual fate, but also for the fate of man as a biological species, and in fact for the fate of the whole planet.
- b) it is necessary to realise the contradiction between a carefree trust in the sustained successes of our civilisation and reality, the contradiction leading to collective apathy and indolence.
- c) it is necessary to develop a certain form of "visionary consciousness", a consciousness of the sense of existence, a consciousness which supercedes the simplified model view of science, that today controls our intellectual style.
- d) it is necessary to get rid of the aggressive "masculinity" that controls our intellectual style, to restore "femininity" in the sense of developing feelings and the ability of motherly care.
- e) it is necessary to accept a certain tension in thinking and acting, to accept also new things that do not fit into our picture of the world and to get rid of the wrong opinion that everything new is dangerous.
- f) unlike the over-idealised "ethics of good" aimed at perfection, it is necessary to form an "ethics of consciousness" that will lead us to the knowledge of what we are doing; only in this way can we distinguish between right and wrong.
- g) it is necessary to restore the spiritual dimension of life, to restore a feeling for our own dependence on Mother Earth and for our own spiritual connection with other people.

The question of achieving such changes is complicated. It is necessary to evaluate the motivation for such changes and especially the methods by which such motivation could be intensified. The motivation for changes in an individual consciousness could start from:

1. strong social feelings and social empathy;
2. deep aesthetic feelings;
3. the need for belief;
4. a deep "transpersonal" experience;
5. philosophical speculations based on the perception of the need for a new paradigm of outlook;
6. personal dissatisfaction with the opportunities that are offered by society and science as a starting point for a change in the state of the world through rational behaviour;
7. the direct feeling of being threatened by a global catastrophe.

Let us leave the last point without comment. The present state is one of direct threat, but it is in this way perceived only by some individuals, whose warnings are intentionally minimised. So what can contribute to the development of motivating the tendencies mentioned in points 1 to 6?

1) The development of special social feeling and social empathy is a very complex matter. It can be developed:

- in the family (it demands a wide background in forming social conditions - the employment of women, a network of services etc., that would enable family education of this kind, and it also calls for cultural activities);
- at the lowest school level (it assumes a different style of work with children, based on experience techniques and the development of natural ethics);
- at secondary schools (the intensification of creative activities, ecological thinking, holistic tendencies);
- at universities and colleges above all in work with future teachers;
- in after-school activities, special interest organisations etc.

2) The development of aesthetic feelings can be closely connected with the development of empathy and creative activities. It will demand the re-evaluation of the impact of modern arts and other genres ("music" production) that often lead more to destructive tendencies among young people. An attitude towards the mass media will ask for fundamental changes, above all it should lead to the re-evaluation of the view of the depiction of violence, death and destruction in films and on television.

3) The need for belief as a starting point for a change in individual consciousness can be developed by new informal attitudes to religious education.

4) Transpersonal experiences should be intentionally used only by theoretically and practically well-prepared psychologists.

5) It will probably be possible to develop philosophical attitudes of this kind at the level of universities and colleges. Some elements of education of this type are a focus of interest because of a tendency towards the humanisation of university education.

6) Personal dissatisfaction is today mostly manifested, not only by the activities of ecological enthusiasts, but also by various actions of groups on the edge of society.

There are many possible ways to use upbringing and education to change individual consciousness, but their realisation will demand basic changes in the attitude towards education, the system of education, social policy and advisory services.

Value Orientation

The evaluation of the state of environmental development and its future prospects would not be complete without an analytical consideration of value orientations, which are a prime mover and co-creator of attitudes in the population. With regard to the striking changes, through which the societies of the central-european region are going, it is possible to judge that considerable changes will also affect this sphere - the sphere of human values (needs and norms).

We will concentrate on the basic question: what is the nature of the present value orientation of the Czech population from the viewpoint of the present environmentalist theory of values and what changes in this field can we expect in the perspective of one generation?

The theory of values, that some time ago was in the same position in the West, has formulated conceptions, two streams of which are interesting for us in a given connection: the first one is the theory of post-materialist values. It is remarkable for the many confirmations by the empirical research which has been done during the last twenty years in all the countries of western Europe and also in the U.S.A. The second stream is the theory of values favourably inclined to a positive solution of the environmental problem and is connected with the "anthropocentrism - biocentrism" discussion.

Post-materialism represents a value orientation predominantly of the young generation, which did not experience the war and the various social insecurities of pre- and post-war society. In this generation the feeling for material possessions, consumption and performance has strikingly decreased and on the contrary - especially in contrast to the older generation - a strong feeling of solidarity, a sense of difference, a feeling for contemporary global problems, "green problems" etc. has been formed - so this generation has identified itself by what mostly has, or at least to a great extent has, the character of not materialist but post-materialist needs and values. Of course we are speaking about the generation of the U.S.A. and the western-european countries. Repeated research over twenty years also confirmed that in the population there were more and more post-materialistically orientated individuals and groups, especially among young people. This fact is a sign of the existence of new attitudes towards the new problems of post-industrial society, it bears witness to the creation of value orientations to which it is possible - figuratively speaking - to connect the attitudes desirable in a given period, or to build a moral orientation on this post-materialist position, e.g. environmental ethics, the ethics of solidarity, the ethics of respect for life etc.

The non-anthropocentric theory of values is an attempt at the systematic development of value structures that will split away from old types of anthropocentrism, especially away from types of arrogant anthropocentrism and it will establish an orientation favourable to the environment - biocentrism (naturocentrism).

Biocentrism is a position that was formed by a simple re-evaluation of the stress on bipolarity "anthropo-" versus "bio-". For this reason its strength is questionable: the bipolar schematicity, basically imitating the cardinal scheme of classical modern european thinking and mainly then the thinking of industrial modernism - the scheme "subject - object" is preserved.

Nevertheless, the category of "non-anthropocentric value orientation" has become quite common as a label of something positive. Also empirical research carried out in 1992 by the research team EKORSA in Prague used it. The results of this research allow us to answer the question about the nature of the value orientation of the Czech population and indirectly the question of where our population is as far as post-materialist values and biocentric values are concerned.

Most people in the Czech Republic declare a preference for a top-quality environment before material possessions which indicates that, in our society too, certain features of value post-materialism have been created. These are, above all, people with higher education, especially women, employees and farmers, are concerned.

Quite a strong declared interest in the environment is usually conditioned by a strong impulse - it is mostly actively conditioned by the consciousness of utilitarian consequences, not an activity unconditionally moral. At the same time, a considerable part of the population (over 50%) thinks that an active public interest in environmental problems will not lead to their solution, which is a fact that causes anxiety.

We would like to know to what extent the Czech population connects the fate of mankind with the state of nature. E.g. an overwhelming majority of the population (over 85%) is convinced about the inseparability of the fate of mankind and nature; this opinion is strongly typical for younger (up to 35) and older (over 50) categories of the inhabitants.

The results of the survey have enabled the division of the Czech population into three basic types:

- the anthropocentrically orientated group of our population represents about 45%;
 - the biocentrically orientated group represents about 30% of the population;
 - the theocentrically orientated group of our population represents about 25%.
- Research methodology then divides them according to the usual criteria of quality:
- anthropocentric value orientation, that is dominant in our population, also shows characteristics of an extreme arrogant humanism (about 1%), of a moderate naturalised humanism (about 21%) and of ecological humanism (about 23%);
 - biocentric value orientation, that is evidently more declarative than real, also shows the characteristics of a radical naturalism (over 12%), or the preference for the environment above humanistically orientated man (nearly 18%);
 - theocentric value orientation, which is not identical with the simple declaration of a religious belief, also shows the characteristics of denominational type (about 6%), and of a type relating to cultural civilisation groupings (19%).

To elucidate the means by which individual groups were distinguished, we will give identification formulations:

Arrogant humanism - man is the master of nature and has a right to treat it according to his needs.

Naturalised humanism - man creates with nature one community and therefore he has to protect it.

Ecologised humanism - man is punished for his disrespect to nature by a bad environment.

Radical naturalism - he, who does not love nature, is apathetic to the fate of people and harms himself.

The preference for the environment - civilisation is progress for mankind, however it destroys the environment.

Denominational type - in nature man recognises God and he behaves accordingly.

Cultural-civilisation grouping - our predecessors gave us nature nearly undamaged and it is our duty to hand it over in the same state to our descendants.

Research has confirmed that among the majority of the Czech population natural environment is not a top value or a value of its own, but still more a value seen and felt through the possible instrumentality and utility.

This phenomenon comes to the fore among people of different age categories in a special way. Research has revealed that younger and older groups (i.e. below 35, or over 51) verbally behave in an analogical way, while the group of people of middle age behaves in a different way: the relationship to the environment of people aged 35 to 50 is cooler, speculative and we could say in a certain sense even "cynical". The evaluating and self-evaluating points of views, according to which it is partly the influence of school, well complement this characteristic.

Our attention is attracted by a type of value orientation covering nearly half the Czech population, and this is the anthropocentric type.

It is possible to consider the relatively small representation of "arrogant humanists" as positive. It is a position of a really lordly attitude to the environment, accompanied by a belief in the power of instruments produced by modern rationality, especially scientific and technological ones. In the Czech population there are not many such people - statistically it is an unimportant proportion (about 1%, it is possible that there might be fluctuations but always at most of 5%). Possible embellishment in the answers of respondents is still a problem.

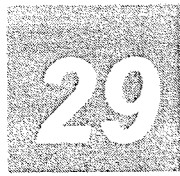
A good representation of the value type called "ecologised humanism" is also positive. This value group, from a general point of view, seems to be the optimal aim of prospective educational influence and also as the bearer of the "epicentre" of the spread of positive, i.e. ecologised structure.

Age and profession are not so important for this value group. The status of women, who feature in the social structure as the informal distributors of basic values (family, upbringing, system of education with a majority of women teachers etc.), is considered to be much more important.

Special attention should be paid also to those who the research identified as "naturalised humanists", i.e. people who "are in no hurry" to leave an anthropocentric and pragmatic instrumentalism, nevertheless they are well aware of the threats resulting from the critical relationship of society towards the environment.

It is possible to consider the contradiction of anthropocentrism and biocentrism to be an expression of the basic motives for the creation of a new value and ethics of the environment. The consciousness of the lack of morality and the inadequacy of its theory, i.e. ethics, was the motive. This consciousness of inadequacy grew out of the experience that the rules of morality tolerate an inconsiderate relationship to

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nature, that a person who behaves inconsiderately towards the environment is still considered to be a moral individual.

The ethics of the environment is based on the idea that morality should include, not only the relationships between people, but also the relationships between people and nature. According to R. Nash (1989), it is the most dramatic spread of morality in the history of human thought. (Here we must point out that Nash should have added "in the European cultural grouping"). In history until recently, there has been a gradual increase in those whose natural rights have to be respected, but only to more and more groups within the human species (Magna Charta, the revolutions of the 17th and 18th centuries, the fight for the abolition of slavery etc.). At the beginning of this century some rights were granted also to animals. Radical ecological movements are extending this circle, not only to animals, but also plants, rocks, rivers, lakes - to the whole of nature on Earth.

Nash developed the idea, according to which this unprecedented spread of morality is not in contradiction with American liberalism, because radical ecological movements are at variance with the traditions of the Western lordly relationship to nature, but they are linked to these liberal traditions which were connected with the fight for the rights of suppressed minorities.

Radical ecological movements consider earthly nature to be "a suppressed minority", whose rights it is morally necessary to protect.

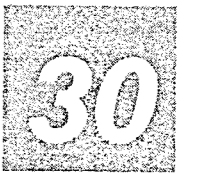
As B.G. Norton (1988) reminded us, anthropocentrism and biocentrism do not have to be in contradiction all the time. While the critics of anthropocentrism state that an interest which is defined exclusively by human needs leaves nature defenceless against the increasing demands of a consumer society, anthropocentrists usually remark that not all human values are determined by an aggressive consumer orientation and that humanistic, aesthetic and moral ideas can reduce the tendency to exploit nature.

The discussion between the supporters of anthropocentrism and biocentrism shows that the present crisis of the environment is a crisis of humanity, the threat to ecosystems is a threat to human life and the existence of mankind, but it also shows that the threat to humanity is at the same time a new opportunity for a new development of humanity. The fact that in the Czech population too this change is taking place is proved by empirical research.

Anthropocentrism is the dominant value orientation of our population - even with an ecological content and elements of post-materialism. This fact is a stimulus also for all types of educational activities.

The erosion of coarse-grained anthropocentrism is an overriding goal of the transformation of the value structures of our population. Only then, in our opinion, is "the biocentric" part of the population, which is much better prepared for the changes of ideas and values in the direction, the goal.

THE ETHICS OF THE ENVIRONMENT IS BASED ON THE IDEA THAT MORALITY SHOULD INCLUDE, NOT ONLY THE RELATIONSHIPS BETWEEN PEOPLE, BUT ALSO THE RELATIONSHIPS BETWEEN PEOPLE AND NATURE



Integration of Sectors

Integration should help to highlight mutual relationships and corrections between individual sectors. These connections are often not only mutual between two sectors but multiple. E.g. agriculture influences many other sectors. The problem appears if we attempt a complex evaluation. It is analogous to e.g. a model of water erosion. The sharper the gradient of a slope is and the longer the slope is and the higher the factor of precipitation is, the higher erosion will be. But how many further factors like that exist? Which are important and which are unimportant? How do they influence each other and how can we quantify them?

It was not in our power to construct a universal model that would include all the sectors and quantify the connections between them. Nevertheless, we consider it useful at least to describe the mutual connections between sectors and with the help of an expert estimation to classify them according to importance.

It will enable us to recognise the most important sectors from the viewpoint of sustainable development and their mutual influence. E.g. nourishment - agriculture - chemistry: a change in the structure of nourishment (a reduction in the quantity of meat consumed per inhabitant per year) will cause a change in the structure of agriculture (less animal production and a smaller demand for maize and cereals). A change in the structure and intensity of agricultural production will change demand for industrial fertilisers (disregarding the fact that demand has already been changed by the increased price of industrial fertilisers). It should be possible to quantify this. Even in this example it is, however, difficult to quantify the influence of a changed structure and intensity of agriculture on the environment and the protection of nature (especially in protected areas and water zones), on growing different crops, e.g. energy plants etc.

From the 21 analysed sectors we have prepared a matrix with 420 mutual connections. We have tried to describe each of them briefly and to classify them according to importance, from 0 (the lowest intensity of the influence and the probability of realising such a situation) to 10 (the highest intensity of the influence and the probability of realising such a situation).

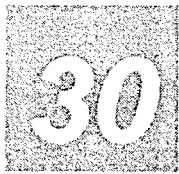
For instance:

Agriculture and nourishment, the health of the inhabitants

Fundamental influence: agricultural policy together with upbringing and education influence the structure and quality of the nourishment of the population, and this again influences the health of the inhabitants. Agriculture influences the health of the inhabitants indirectly, through the components of the environment (water and soil).

The number of points: 10

The summary of the points evaluation is given in table No.4.



Those connections between sectors that have more than 7 points should be monitored in detail. We consider the connections with 0 to 3 points to be unimportant, but we should "be aware of" the connections with 4 to 6 points.

According to the total number of points it is possible to determine the total level (the intensity of an influence) of a certain sector on other sectors (the column on the right in the table). In the same way, it is possible to determine the total level (the intensity of an influence) of a certain sector by other sectors (the bottom line). Then it is possible to say that, according to the evaluation, other sectors are influenced by a political system most (165 points), by the economic system (161 points), by the system of values (159 points), by the legal system (141 points), by industry (138 points) and by the environment (132 point).

The sectors most influenced by the impact of other sectors are: the economic system (157 points), the environment (151 points), the system of values (145 points), tourism and recreation (137 points), the security of the state and inhabitants (128 points), and industry (125 points).

On the basis of the above-mentioned evaluation, the following are key sectors for the functioning and behaviour of society:

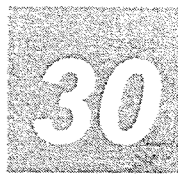
- the system of values;
- the political system;
- the economic system;
- the legal system.

To influence the strategy of the development of society we consider investment in the following sectors to be vitally important:

- education, upbringing;
- telecommunications;
- nourishment;
- reconstruction of the energy industry;
- reconstruction of agriculture (including the intensification of the landscape-forming function of agriculture);
- the restructalisation of industry
- transport;
- tourism and recreation;
- security.

If we start from education and upbringing, which is, from a long-term viewpoint, an important sector, education leads to cognition (and should lead to understanding and wisdom), upbringing then leads to the acceptance of certain opinions and types of behaviour. This leads to an acceptance of certain value orientations and to the forming of a system of values. Value orientations basically influence nearly all our behaviour and their influence on the political and legal systems is the most important. These fields then fundamentally influence the economic system and the security of society. The economic system, together with all the above-mentioned sectors, influences other sectors connected with material production and services

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(mining, the energy industry, agriculture, forestry, water management, industry, transport, telecommunications, tourism and recreation). Material production and services, together with the above-mentioned sectors, essentially influence the state and development of the quality of the environment. All these sectors influence the demographic situation, nourishment and the health of the inhabitants, national and ethnic problems, urbanisation and settlement) and all this also influences international co-operation.

We have not attempted a quantification of mutual relationships and connections between sectors. We think, however, that it would be possible to quantify individual connections between sectors in at least four ways:

- by monitoring flows of energy - this is applicable both to human society and to ecosystems;
- by monitoring flows of money - these will evaluate both the energy and input of human work and skill;
- by monitoring material flows in society;
- by monitoring non-material flows (information) in society.

Table No.5 - Integration of Sectors

Influencing Sector	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	B	Order
1 International Relationships	*	7	4	4	4	4	2	5	5	1	8	5	3	9	9	8	7	7	7	5	8	114	9-11
2 Environment, Landscape	8	*	6	4	4	7	8	8	8	5	4	0	10	8	8	9	7	8	5	7	9	132	6
3 Population	4	2	*	1	1	2	1	0	1	5	1	6	6	8	1	5	1	6	7	4	6	63	21
4 Mining	2	10	3	*	9	6	2	5	8	6	3	0	6	2	5	6	1	2	1	2	3	82	19
5 Energy Industry	7	10	5	8	*	6	7	7	9	6	7	2	7	6	6	9	2	3	4	1	4	114	9-11
6 Agriculture	3	9	6	3	3	*	2	8	6	7	4	0	10	4	8	9	2	4	1	1	8	98	14
7 Forestry	3	8	1	3	5	6	*	8	5	3	4	0	4	1	7	6	3	1	0	4	5	77	20
8 Water Management	6	9	2	5	7	9	8	*	9	9	6	0	9	6	8	8	1	2	5	1	6	116	8
9 Industry	6	10	7	8	8	8	7	8	*	8	8	5	7	6	6	10	5	6	5	2	8	138	5
10 Urbanization, Settlements	1	6	7	2	5	6	2	7	7	*	8	8	7	7	8	7	1	6	6	6	7	114	9-11
11 Transport	6	6	1	3	4	4	3	3	7	8	*	3	4	7	8	8	1	1	1	2	5	85	16
12 Telecommunications	8	4	0	1	1	0	0	0	6	7	3	*	2	7	6	8	2	7	4	8	9	83	17-18
13 Nutrition and Health	5	2	9	0	1	9	1	7	5	5	1	0	*	3	6	7	5	5	1	3	8	83	17-18
14 Security	8	8	7	1	4	1	1	3	4	4	7	6	5	*	7	8	7	8	6	5	8	108	13
15 Tourism and Recreation	7	7	2	2	3	6	6	7	6	7	7	7	6	6	*	8	2	6	2	6	7	110	12
16 Economic System	9	10	8	8	8	8	7	8	10	6	8	8	7	8	7	*	7	9	8	8	9	161	2
17 Legal System	8	10	5	4	5	7	7	6	8	6	4	4	6	10	8	9	*	9	9	9	8	141	4
18 Political System	10	10	6	7	7	9	7	5	9	8	7	8	7	10	8	10	10	*	9	9	9	165	1
19 Nation. and Ethnic Problems	8	5	6	1	1	1	1	1	3	5	1	0	1	9	8	7	8	7	*	9	8	86	15
20 Education and Upbringing	5	8	5	3	5	5	4	4	4	6	4	6	7	6	6	7	8	8	8	*	10	119	7
21 Human Values	7	10	6	6	8	8	7	7	7	9	7	9	9	7	7	9	9	10	8	9	*	159	3
A Intensity of the Influence	121	151	96	74	96	116	83	107	125	121	102	70	123	128	137	157	89	115	97	97	145	*	*
Order	8-9	2	16-17	20	16-17	10	19	12	6	8-9	13	21	7	5	4	1	18	11	14-15	14-15	3	*	*

B - Intensity of the Influence of the Sector by other Sectors

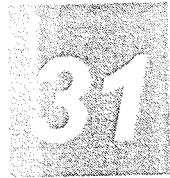
A - Intensity of the Influence of the Sector on other Sectors

PART II.

Towards Sustainable Development

In the previous part we tried to analyze the present state in chosen fields, we described several alternative economically-orientated scenarios of development and we tried to find some mutual connections and relationships between the fields.

Now we will try to create a synthesis, an outline strategy of sustainable development. No matter how imperfect this synthesis may be, it is based on cooperation with thirty specialists in different fields and it should be at least an inspiration and a challenge to formulate a more detailed strategy of sustainable development and a sustainable way of life.



The Development of Man

If the Big Bang theory is valid, our Universe came into existence 15 - 20 billion years ago and our planet 4.6 billion years ago. If the theory of evolution is valid, the first rudiments of life appeared on Earth more than 2 billion years ago and inorganic evolution on Earth changed into organic, biological evolution. Only 40,000 years ago Homo sapiens sapiens appeared and at the same time biological evolution changed into cultural evolution. Later we will mention that this stage of development might not be the final one and mankind will enter the stage of ethical, spiritual evolution.

If the age of our planet is represented by a twenty four hour day, then Homo sapiens sapiens appears only on stage in the last L' of a second before midnight!

At that time man was a hunter and gatherer and he did not affect his surroundings too much. He used primitive tools, he had well-developed speech, he was capable of abstract thought and used fire. It means he could endanger himself or his immediate surroundings e.g. by forest fire, which however did not affect his environment a great deal.

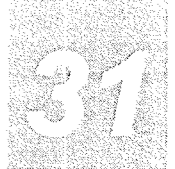
Gradually man - a hunter-gatherer - becomes a herdsman and a nomad. At the end of the ice age the climate of the northern hemisphere (15,000 - 10,000 years ago) changed. The herds of deer either died out, or went north. Therefore man had to look for supplementary sources of sustenance. He developed fishing and above all the gradual domestication of animals occurred.

At that time man could already affect his environment regionally. The immoderate usage of pasture-land and its subsequent degradation occurred. People had to migrate and look for new territory. Fights between tribes or the breaking up of tribes took place. In the Old Testament, in the first book of Moses, the parting of Lot from Abram is described: "... the land could not support both of them dwelling together; for their possessions were so great that they could not dwell together; and there was strife between the herdsmen of Abram's cattle and the herdsmen of Lot's cattle. At that time the Canaanites and the Perizzites dwelt in the land. Then Abram said to Lot, "Let there be no strife between you and me, and between your herdsmen and my herdsmen; for we are kinsmen. Is not the whole land before you? Separate yourself from me. If you take the left hand, then I will go to the right; or if you take the right hand, then I will go to the left".

But even if man destroyed his pastures and left, the countryside had enough time to regenerate.

In the Early Stone (Neolithic) Age (10,000 years ago) a big change occurred. Man started to collect, store and sow the grain of some plants and above all he started to settle, especially in warm regions with a loess soil. This change is called the agricultural revolution.

At that time on the whole planet there were about 5 million people. It was possible for more people to provide for themselves with the help of a new way of life than it had been by hunting and gathering. Centres of big communities were created first of all in the fertile alluviums of the big rivers of subtropical and mild climate zones (the Nile, the Euphrates and the Tigris, the Indus, the Ganges, the Yellow River etc.).



It was already in the power of man to intensively influence and destroy his environment, both locally and regionally. The Greeks, Carthaginians and Romans managed to devastate a substantial part of the territory of the Mediterranean, above all by the deforestation of vast territories, and also by their over-intensive grazing, the erosion of turf soil and the subsequent water and wind erosion of the soil right down to the rock. Because of intensive irrigation in antiquity, the territory around the rivers Euphrates and Tigris and around contemporary Palestine and Israel were devastated. The agricultural soil was salinated (water containing mineral substances evaporates and the salts stay in the soil) in the course of centuries and the land changed into semidesert or desert.

The fundamentals of the development of science and technology were laid down in antiquity in the Mediterranean, the Near East and also China and India. A technologically-orientated society, however, arose from the Mediterranean and spread gradually to the north and north-west of Europe. In the Middle Ages, the land of central and western Europe was deforested and its appearance changed extensively (the territory of central Europe was originally more than 90% covered by forest, today it is about 30%). But two factors helped to save the European countryside from devastation. On the one hand the ecosystems of the mild climate zone are more resistant to anthropogenic influences, on the other hand European culture was suddenly given a chance to expand in 1492 - they discovered America, which was colonised in the following centuries. Even here the countryside was deforested and there were similar changes as in Europe.

Until that time man had been completely dependent on nature and his ability to affect the environment limited. The turning point, however, came 300 years ago. Papin invented and eight decades later Watt constructed the steam engine, the era of the industrial revolution began. Man started to use energy from fossil fuels on a large-scale and he increased his power many times over. The consumption of natural resources and energy increased exponentially.

Exponential growth hides in itself a great danger. For instance the consumption of electrical energy has doubled every ten years over the last century. In the last 60 years the consumption of energy has risen by 3 - 4% every year. But if this tendency continued, in 3,200 years we would need the energy of the whole Sun and in 5,800 years the energy resources of the whole galaxy! So exponential growth is not tenable from a long-term viewpoint. Even today we have reached the physical "limits of growth", as our situation was called by Donella and Dennis Meadows in the first report to the Club of Rome more than 25 years ago.

Our space is limited simply by the size of the biosphere. Our resources of raw materials and energy are limited and from the long-term viewpoint it is irrelevant whether they last 5 years or 50 years at the present rate of consumption. The devastation of the environment is a signal that we have reached the limits in using the biosphere on a regional and global scale. There is nowhere to escape. So we must learn to live within these limits.

During the whole period of his existence, man has influenced the environment in a positive way (at least from an anthropocentric point of view) and also in a negative way, his possibilities, however, were limited. This has changed especially during the last two or three centuries and the successes of industrial civilisation led us to a feeling of ascendancy over nature and to a belief in the unlimited ability of science and technology to find a solution to every problem.

So we may be able to come to the particular conclusion that contemporary generations are basically neither better nor worse than the previous generations. We have, thanks to science and technology, substantially greater opportunities which are not counterbalanced by greater responsibility and also foresight. In comparison with past generations we are more experienced, but it seems that we are hardly ever able to use this experience in a positive way.

Natural Factors Influencing the Biosphere

The first predecessor of man (herbivorous Ramapithecus) appeared on Earth not such a long time ago - about 8 - 14 million years ago. Until practically the present day the influence of man on the biosphere was very limited. Everywhere on the planet, however, there were changes, vast natural processes which we could call catastrophies from an anthropocentric point of view.

The fall of an asteroid onto Earth used to be an isolated, but always "catastrophic" event. Our planet probably collided with an asteroid approximately 20 - 30 km in diameter about 65 million years ago. This might have been the cause of great changes in the representation of plants and animals, including the extinction of the dinosaurs (these made room for the evolution of mammals).

A collision with an asteroid at great speed releases energy which equals the explosion of hundreds of atom bombs. Besides a strong blast and fires lasting for months, in the atmosphere there were more than a billion tonnes of dust. The fires filled the troposphere with smoke and soot. In this way the intensity of solar radiation falling on the surface of the Earth was lowered to one per cent of its normal level which is an intensity comparable with the light of a full-Moon. It lasted approximately one month. Within about 6 months the solar radiation was back to half intensity. In this way the temperature fell by 20 - 30 degrees centigrade, so even in the tropical zone the temperature was around zero. Plants (because of the lack of light and the cold) and animals (because of the cold and the lack of plants) died out on a large scale.

The movements of the litospheric plates ("continents") are important for the development of the Earth and life on it. The movements of continents and the flow in the crust of the Earth condition at least three important phenomena:

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32

A COLLISION WITH AN ASTEROID AT GREAT SPEED RELEASES ENERGY WHICH EQUALS THE EXPLOSION OF HUNDREDS OF ATOM BOMBS

- the creation of the magnetic poles of the Earth;
- volcanic activity and earthquakes;
- the covering of the continents by ice and the rise of the ice ages.

The change of polarity of the geomagnetic poles took place approximately once every 750,000 years in the past. The change of polarity lasted several thousand years. During this period the intensity of short-wave solar and cosmic radiation falling on Earth increased, which could influence mutation and genetic changes.

As a result of the movements of continents, dislocations, friction and stress in the crust of the Earth appear. Accumulated energy is released sometimes suddenly as tectonic earthquakes. Focal centres of redhot magma also appear and a large amount of gas and steam is released. Due to excess pressure an explosion can occur.

In 1883 the explosion of a volcano destroyed the island of Krakatoa near Java. It was possible to hear the explosion 5,000 km away and the tremors were recorded in all the seismological centres of the world. 20 km³ of ash was blown into the air. A tidal wave (tsunami) caused by the eruption killed 36,000 people. As a result of the eruption some islands sank while others appeared.

On a long-term and global scale evolution is influenced by continental glaciers. These move because under the glacier the high pressure lowers the melting point and a small layer of water forms on which the ice slides (it is the same principle as in skating).

Ice ages have appeared quite rarely on Earth. The first ice age maybe took place in primary rocks, 2.3 billion years ago, another 400 million years ago, then 250 million years ago the last ice age was in the quaternary period and ended only 10,000 years ago (unless it is still going on and we are living in between two ice ages). During the last ice age big mammals in mild climates died out due to a lack of food.

So even without the endeavour of man, life on the Earth developed under the influence of gigantic changes. Maybe that is why new organisms capable of adaptation and survival came into existence.

Recently man has been affecting his environment with a power and intensity comparable with the above-mentioned phenomena. But this influence has increased to a global extent over an unbelievably short period of time. If, for instance, under the influence of the change in geomagnetic polarity the changes were in progress gradually over thousands of years, with the same trend of development man would exterminate half of all kinds of plants and animals on the planet by the end of the 21st century!

We do not think we could jeopardize the essence of life on Earth. But we can cause great suffering to all living beings and even to ourselves.

32

SO EVEN WITHOUT THE ENDEAVOUR OF MAN, LIFE ON THE EARTH DEVELOPED UNDER THE INFLUENCE OF GIGANTIC CHANGES



The Biosphere and the Environment of Man

The biosphere is the part of the globe in which living organisms exist and in which ecosystems work (Duvigneaud, 1988). In other words, it is a vivified "skin" encircling the planet, 20 km deep (approximately 9 km above and 11 km below sea-level). Approximately 95% of all living organisms are found in a layer only about 3,700 metres deep (3,500 m above and 200 m below sea-level - because solar radiation penetrates to a depth of only about 200m where photosynthetic processes can be in progress and other forms of life at greater depths are dependent on detrital fall-out).

The Earth's radius is 6,378 km. So it is clear how thin a skin the biosphere is. So far the only known forms of life in the Universe are on our planet. Our distance from the Sun is 147 - 150 million km. If we got closer than 145 million km to the Sun, the water from the oceans would evaporate. If we moved further than 152 million km from the Sun, the water in the oceans would freeze up. So life is a miracle and a great gift.

The environment of Man is the part of the world with which man is in mutual relationship, i.e. which he uses, influences and to which he adapts (the definition of UNESCO). To put it simply, the whole biosphere is our environment today. Therefore it is in our interest to take care of our environment, i.e. the biosphere as best we can.

Enlightened rulers in the past were able to realise the importance of nature and natural resources. As long ago as in antiquity (in Egypt) and in the Middle Ages from time to time there appeared regulations of a ruler concerning the economic exploitation of the woods. But wildlife protection has been developing more systematically in Europe over about the last 150 years. We can distinguish several periods:

- the 1830's saw the beginning of wildlife protection; it was a period of individuals who were romantic revivalists and enlightened nobles; new "reserves" were established on private estates; by 1918 there were already 20 of these on the territory of the Czech Republic;
- from the 1870's to the 1920's club activities of various associations for wildlife protection were typical;
- the year 1872 was the first time the state was involved in wildlife protection (Yellowstone national park was established "for the good and pleasure of people"). The U.S.A. was followed by other countries that started to take responsibility for wildlife conservation. This process was completed in the advanced world after World War II.

Approximately in the 1960's and at the beginning of the 1970's the understanding of the concept "wildlife protection" was being extended. There was a need to protect and take care not only of species of plants and animals, but also of their "environment" - of whole ecosystems and the countryside. The concept "the protection of the natural environment", later "the protection of the environment" or "the protection and forming of the environment" is being implemented.

In the second half of the 1980's another qualitative change occurred. The report of the UN Commission for Environment and Development, called "Our Common Future" (1987) defined the concept of sustainable development. The idea of sustainable development attracted great attention and as early as 1992 the so far largest conference in the history of mankind, the UN conference on environment and development, took place in Rio de Janeiro.

Gradually there appeared dozens of definitions of sustainable development or growth (the concept of sustainable growth is often used by economists; on the other hand environmentalists and ecologists usually criticise and condemn it), a sustainable society, a sustainable future or a sustainable way of life. This dispersion and heterogeneity is logical. For instance, modern economics has been developing the concept of the market economy for nearly 200 years, the concept of sustainable development (way of life, etc.) has been developing for 10 years. The point is no longer a matter of biological or geographical disciplines, but it is a real interdisciplinary matter. Not only specialists in the natural sciences, humanities and technical branches, but also artists (an emotional component counterbalancing a one-sided rational view of science) and involved citizens (as will be mentioned later, a sustainable society is based on the increasing importance of participatory, direct democracy) will take part in formulating and pushing through the conception of sustainable development and a sustainable way of life.

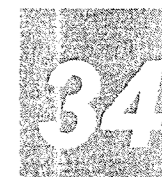
The Third Global Revolution

It is likely we are approaching a great qualitative transformation on a global scale. Eight thousands years ago man - hunter and nomad - became a settled farmer; it was the neolithic revolution. Three centuries ago we learnt to use the energy of fossil fuels, this technical and industrial development set the course of Euro-american civilisation; it was the industrial revolution. Over the last three decades the most developed countries have moved into another phase which is called postindustrial. At first physical power (of individuals and armies), later money, was crucial and necessary to gain power and become a ruler. Now knowledge and information have become vital. Even the postindustrial era is understood by futurologists as a continuation of previous development, only the main conditions of development are not metal and energy from coal power-stations any more, but knowledge and the increasing contribution of non-material activities to gross domestic product.

According to Alvin Toffler, (1980) the U.S.A. was the first state to enter the postindustrial stage in 1955 when the number of intellectual workers in the sphere of services exceeded the number of manual workers. (Today in the U.S.A. only 2 - 3% of the economically active population work in agriculture, 15% in industry and 87% in the tertiary sphere. But even in the tertiary sphere there is a process of division into creative workers and service personnel. For instance, as far as computers are concerned there are creators of software and operators. It means a new "educated proletariat" is being formed.)

The U.S.A. was followed gradually by other countries of the industrially developed world. Other states, which have gone through rough and rapid industrialisation not

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34

such a long time ago - South Korea, Taiwan, Singapore, Hong Kong, but also Malaysia, Indonesia, Thailand - have recently joined this world. According to Naisbitt (1992) at the beginning of the 21st century the most dynamic and developing territories will be the Pacific Regions (a vast territory including the west coast of North and South America, the coastal territory of China [and maybe even the eastern part of Russia], Japan, south-east Africa, Australia and New Zealand).

Judging according to the coefficients of the growth of gross domestic product, cheaper labour and work efficiency in the Pacific Regions, Europe is likely to fall behind. But we think that the change, which has already started and will finish in the first half of the 21st century, will be even deeper than "only" the transformation to a postindustrial society. The point will be a change of direction of our civilisation, a revolution in our aims, a new questioning of the meaning of life ("why in fact are we here?") and a change in our value orientation. We are not only heading for a postindustrial society, but at the same time it will be a period of ethical revolution and spiritualisation.

So the third global revolution is comparable in importance with the neolithic and the industrial revolutions. Next we would like to try to elucidate the very substantial, maybe vital precondition of the third global revolution - sustainable development and a sustainable way of life. Before we do so, we should go back to the industrial era and try to understand what was typical for it and what it bequeathed to us.

Alvin Toffler, in his famous book "The Third Wave" (1980), describes an industrial era with the help of six main characteristics:

1. Standardisation or uniformity, which is a consequence of mass production.
2. Specialisation or professionalism. If people want to be in demand in the labour market and find their place in society, they must be more and more specialised. Michael Pertschule (former chairman of the US Federal Trade Commission) said: "Our culture is controlled by professionals, who call us customers and speak about our needs."
3. Synchronisation or work with time. Time is money - that, which should free us, paradoxically enslaves us. E.g. expensive machinery cannot sit idle and that is why there are the second and third shifts.
4. Concentration of production which also influences the concentration of settlement. At first big industrial centres appear, and later also trade, financial and other centres.
5. Maximalisation. We were stupefied by size and growth. "Big" became a synonym of the word "effective", "growth" was identified with "development", or even with "progress".
6. Centralisation of power. In the industrial era power was centralised as never before; the symbol of power became above all the sovereignty and inviolability of national states.

Toffler also defines some other characteristics of which at least three are interesting for us:

34

a) Mass education. Only the industrial era made it possible for education not to be a privilege of the nobility and monks in monasteries. We learnt the 3 R's (reading, writing and arithmetic). But at school we also learnt to be precise (lessons start every day at exactly the same time), to be obedient (towards authority - the teacher) and to be able to do monotonous, repetitive tasks (e.g. learning arithmetic by constant practice).

b) The nuclear family. In the pre-industrial period the extended family (including relatives) living together was typical. In the industrial era people often move to town and during their productive years they must be as free as possible to work in the factories. That is why preschool institutions for children, homes for the elderly and the sick etc. appear. Gradually the family disintegrates to the most basic unit - parents and their children.

c) The producer is separated from the consumer through the market. The market is an exchange network, a switchboard which contributed greatly to the growth of production. The separation of production from consumption, however, causes a deep conflict between demands for higher pay, profits and emoluments from the side of the producers (workers and management) and the opposite call for lower prices, demanded by the consumers (at the same time "producer" changes into "consumer" every day after leaving the factory). The consequence is the need to produce more and consequently also consume more. This is the origin of the consumer style of life, which is today "whipped up" to an extreme by advertisements.

The consumption of energy from fossil fuels, exponential growth and the consumer way of life, together with imperfect or bad technology and the methods of economic and political control have caused serious ecological and other problems, which for the first time in history have become really global.

It would be possible to devote a whole encyclopaedia with many thousands of pages to the present global problems. Here we will restrict ourselves only to the shortest characterisation of the problems (or the groups of problems) which we regard as the most essential:

1. Violence in the world. The point is not only the continuing (and even increasing) threat of nuclear conflict when more and more countries and also terrorist groups will have access to nuclear weapons, but also organized crime that is becoming in many countries or regions as powerful as the government (Columbia, Sicily, above all present-day Russia). Here we can also put terrorism (often supported by governments), militant religious fanaticism (as an acute form of religious fundamentalism), ethnic intolerance, but also contempt for human rights which is so familiar to us from the recent past.

On a local level (above all in cities) crime operates like a cancer initiated by a cult of violence in the mass media, and aggressive advertising supporting the increasing expectations of an ideal consumer society that cannot be fulfilled in real life (it concerns mainly people in developing countries and the poor in the cities of the developed world).

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2. The explosive growth in the population in non-industrialised countries (80% of the 5.6 billion people on the planet live in the non-industrialised and mostly poor countries; the population now doubles every 41 years) and on the other hand the ageing of the population (and in places even an absolute decline or slow "dying out") in most countries of the industrial world. If this explosive growth in population continues unchanged the consequences are clear. But even in developed countries there may be great social unrest in the next 20 - 30 years when the economically active population will not be able or willing to take care of pensioners according to their expectations.

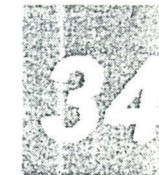
The developed world is faced with the threat that it will become a "ghetto of the rich", surrounded by the overpopulated, poor, frustrated and aggressive "rest of mankind". Even inside the developed countries, ethnic tension will increase not only as a result of a wave of immigration from poorer and unstable regions but also because of unbalanced population growth among single ethnic groups.

3. The uneven and unfair distribution of wealth. The North - South divide has replaced the former understanding of the world divided into East and West. Today, 20% of the world's population live in dire poverty, 20% of "the elite" use 80% of the resources of raw material and contaminate the planet with waste. The equivalent of consumed energy per inhabitant per year is 20 kg of crude oil in Ethiopia while in Canada it is 10,000 kg of crude oil. It is possible to object that in Canada there are less favourable climatic conditions; in spite of this the rate 1 : 500 does not seem to be totally fair. (For comparison: in 1991 the former Czechoslovakia used an equivalent of 5,100 kg of crude oil per inhabitant per year). The disparity among the population in non-industrialised countries is even bigger. The rate of incomes between the 20% of the population with the highest incomes and the 20% of the population with the lowest incomes is e.g. in Columbia 25 : 1, in western-European countries it is about 8 : 1.

This disparity also causes dissatisfaction and the migration of large groups of people (the real threat of a new exodus of nations) and also the growth of religious fundamentalism in regions where the local cultures feel themselves to be endangered by the expansion of the values and the way of life of the West or Euro-American culture.

4. Destruction of the environment. Under this heading the most vital problems are:

- the threat to the generic variety of life - genetic, generic, ecosystemic, but with people also cultural diversity. Euro-American culture is dominant on the planet; islamic culture tries to resist it (by means which are sometimes unacceptable to us) but many other cultures, above all those of tropical forests, disappear;
- the threat to and wastage of forests, above all of tropical rainforest;
- desertification;
- the threat to the quality of water resources (including seas and oceans) and the threat to the quality of accessible sources of fresh and drinkable water in some regions;
- the threat to the soil (its quality and quantity);
- the pollution of the atmosphere and climatic change (acid rain, ozone layer depletion, the greenhouse effect);



- pollution and the threat to the ecosystems caused by waste (above all toxic and radioactive waste and also vast quantities of communal waste).

5. The total ineffectiveness of political and economic tools and institutions, above all on a supranational scale. The principle of national sovereignty is problematic. It is necessary to decentralize certain powers (the principle of subsidiarity - let everything be decided at the lowest level at which it is possible), to centralize other powers in the hands of viable and effective supranational institutions (how big the challenge is it is clear from observing the present functioning of the UNO and the negotiations concerning the principles of the functioning of the European Union etc.).

In the near future we will be confronted even with the problems of "biological revolution" (e.g. the possible misuse of the knowledge of genetic engineering) and with the problems connected with the entry of many countries into the postindustrial era (the problem of the rate of employment and the spending of free time, the division of the population into "able" and "unable" to make themselves useful in intellectually demanding employment etc.). But it is necessary to say that many countries will remain for a long time in the stage of industrial development and that many countries will continue to be in Toffler's "first wave" - in the agricultural stage of development. This can lead to a new division of the world into post-industrial regions (rich, with a high level of creative, intellectual work), industrial (providing gross industrial production) and pre-industrial (with a predominance of agricultural production and problems with poverty, the rate of employment and competition on the international markets).

Global problems will become increasingly acute and we will be confronted more and more with the necessity of finding a solution. It means even time is an acute problem.

We could ignore global problems. This would mean that present trends would be preserved, we would not react to them adequately and the situation would continue to become acute.

Or we could acknowledge the seriousness of global problems, but sceptically think that we do not have a chance to influence the situation essentially, anyway.

But we could also try to change present trends, whatever the chance of success may be. One possible active attitude is the formulation and implementation of a strategy of sustainable development. The vision of sustainable development should be understood as a source of hope, a positive solution, a way out of more and more acute global (not only ecological) problems. Its advantage is that it could be acceptable for representatives of various religious and cultural systems (which is indicated e.g. by the UNO Conference on Environment and Development in Rio de Janeiro in 1992, in which 178 national delegations took part and also the adoption of "Agenda 21" at this conference).

As has been mentioned above in the analytical part, according to the World Commission for Environment and Development sustainable development is a development which satisfies the needs of the present without threatening the need of future generations to satisfy their own needs... In the widest sense the strategy

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of sustainable development is concentrated on the attainment of harmony among human beings and between mankind and nature.

This definition is the best-known but it is nevertheless orientated in quite an anthropocentric (which itself might not be so bad) and narrow way.

Jan Topercer defines sustainable development as a process which aims at changing the behaviour of human society towards itself and also towards its environment (the land and its resources), leading to an increase in the present and future potential to satisfy the needs of people and other beings within the limits of the land and its resources.

Topercer defines sustainable development more biocentrically (the right to satisfy needs relates not only to people but also to other living beings) and more positively - the stress is put on the increase in the present and future potential to satisfy needs, not simply on ensuring contemporary needs and "not jeopardising" the needs of future generations. We think this definition should be an ideal, a desirable aim for the 21st century.

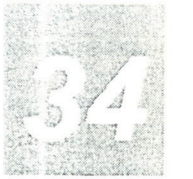
Josef Vavroušek thought that sustainable development, or a sustainable way of life should make an effort to find the ideals of humanism and a harmony in the relationship between man and nature. It is a way of life which looks for a balance between the freedoms and rights of each individual and the individual's responsibilities towards other people and nature as a whole, including responsibility towards future generations.

From the above-mentioned definitions it is clear that sustainable development or way of life does not aspire to become an all-encompassing vision, a new "religion", which would solve all the problems of the world and establish heaven on Earth. A sustainable way of life above all means:

A demand that everyone on Earth should be able to satisfy at least their basic needs. As basic needs we can consider food, drinkable water, clothes, shelter and also the possibility of satisfying these needs in a dignified way, i.e. by working. But we could also include here the right to a hygienically acceptable environment of man. At the same time the understanding of basic needs should be extended to cover needs of a non-material character - i.e. relationships among people.

However particularly with material needs there is an essential problem - where is the limit of their satisfaction? When do we have enough? This was impossible even for once so ambitious communism to answer, even at the theoretical level: "To each according to his need, from each according to his ability." Is, however, a car a justifiable need? A yacht? A flight to the Moon? So far it seems that our desires, understood as needs (and these then as needs to which we have a right), far outstrip our ability to satisfy them. So we will have to change our attitude. Our needs could be satisfied only to the extent to which our planet, "a spaceship", from which at least in the near future there will be no escape, is capable.

A demand that even future generations of people could satisfy their needs and live dignified lives at least to the extent to which we can. This is a big challenge. Over the course of history more and more groups of inhabitants have gradually asserted their rights. Both slaves and serfs, then later black people and other "non-whites" asserted their rights against the whites; then democracy as majority rule appeared,



but later also on the contrary the right of minorities vis á vis the majority, the rights of women etc. appeared. But always these rights were acknowledged after a clash, under pressure, after a struggle which was led by violent or non-violent means. Maybe for the first time in history we are now starting to think of the rights of the generations to come, that cannot defend and assert themselves.

A demand for balance between the freedoms and rights of the individual and his responsibility. In the words of Josef Vavroušek: "Freedom of the individual does not end only where the freedom of another individual starts, but it ends also where the destruction of nature begins." The last century was, among other things, characterised by liberalism. But if our freedom and our constantly increasing opportunities are not counterbalanced by responsibility and also by the ability to foretell the consequences of our actions, then we will inevitably cause suffering to ourselves and to nature.

A demand to respect the rights of other living beings. It is again a challenge which was not here in the past, or which we did not admit when "conquering" the world. We have three possible ways of reacting to this challenge:

- a) to continue to claim that "might is right", to conquer the world and assume the role of "master of all living creatures";
- b) to become a responsible custodian of the planet and within the limits of the possible to take care of organic and inorganic nature;
- c) to consider other beings as equal (a strictly bicentric view).

I personally prefer the second possibility. Even this "compromise", however, will put heavy demands on our behaviour, such as the strong limitation of the consumption of food derived from animals, in the long term maybe even conversion to vegetarianism.

A demand for harmony (or at least an approach to it) of relationships between man and organic and inorganic nature. The point is not an extremist demand for change in the regularities and natural function of ecosystems and nature, but a consistent accomplishment of the heritage of A. Schweitzer: a respect for life and nature. In this sense it is for instance unacceptable to tolerate the gulf between the rich and the poor not only inside a single state but between rich nations and poor nations.

A demand to learn from the future and the precautionary principle. In the past our learning was based on the process of experiment - (mistake) - experience. It is high time to adopt anticipatory learning, i.e. learning based on anticipating the possible consequences of our actions. For instance we are still not sure, whether the threat of the greenhouse effect is real and the model calculation right. In spite of this we must act as if it were absolutely real. The consequences of our making a mistake would be so far-reaching that they would threaten and maybe destroy the whole of civilisation.

In a similar way we will have to relate the precautionary principle to the consumption of non-renewable resources, above all of fossil fuels. These were formed on Earth over tens of millions of years and we can deplete them in the course of several decades in the most primitive way - by burning. In reality they may one day be replaced by other sources of energy, but until that day comes, we must economise on fossil fuels in a sustainable way.

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25 years ago one professor advised farmers not to worry about protecting the soil from erosion. Within 20 years, he said, agricultural plants would anyway be grown in water solution (in a hydroponic way). If farmers had listened to the scientist and had not respected the precautionary principle (or we could also say "common sense" in this case), they and a part of the population would be without food today.

So the transformation of society to a sustainable way of life means essential changes in its functioning. But is the vision of sustainable development applicable globally? We think it is. On one hand, as was said, it does not have the aspiration to become "a new religion" or in the worst possible case an ideology that unites people and makes them happy, whether they want it or not. On the other hand we believe that the principles of sustainable development correspond to "the law of naturalness". This law of naturalness is generally valid and the English philosopher C.S. Lewis explains it in the following way: "The ancient philosophers used to speak about the law of "right" and "wrong" and called it "the law of naturalness". Its core was the idea that in the same way as solid bodies follow the law of Earth's gravitation or as organisms follow biological laws, also the being named man has his own law - of course with the essential difference that a solid body is subject to the law of gravity whether it wants to be or not, while man can keep or break the law of human naturalness according to his choice ...I know, there are people who will object that the idea of the law of the naturalness of decent behaviour as something familiar to everyone is not well-founded because in various civilisations and at various periods of time there have been different moralities. This, however, is not true. The fact that their moral principles differ from each other never means a total difference. If somebody takes the trouble to compare the moral precepts for instance of the ancient Egyptians, Babylonians, Hindus, Chinese, Greeks and Romans he will be surprised how similar they are to each other and how similar they are to our precepts. We can differ as to whom it is necessary for man to be unselfish - whether only to his family or to his compatriots or to everybody. But they always agree that they cannot put themselves first.People could disagree whether a man should have one woman or four, but they always agreed that he could not have any woman he liked."

What Should We Do?

How should we react to the increasingly acute local, regional and global problems? As individuals and also as a society we have at least three alternatives.

First, we can underestimate and minimize the problems. Many people believe that the situation is not serious and that it is not necessary to worry. They consider the threat of the greenhouse effect or the depletion of ozone in the stratosphere as so far not sufficiently scientifically proven and they ask for further measurements and investigation. They do not believe in the exhaustibility of non-renewable sources of raw materials and energy and believe that at the right time we will find the right replacement. They insist that the Earth has the prerequisites to feed tens and maybe hundreds of billions of people as if a scientifically given, hydroponically grown dose of food was enough for man to live on. This attitude means that it is not necessary to act, we can continue our previous economic growth. If we doubt it, we undermine in this way, according to these people, our previous understanding of development and progress and we cast doubts on the aim that is so tempting - to

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reach prosperity and the satisfaction of material desires at least to the extent in which we can see it in western countries.

Let us suppose that the supporters of this attitude sincerely believe in what they say. Let us also suppose that many phenomena which endangered the environment operate in the long term, they are not felt immediately; these phenomena are very complicated and it is difficult to prove they exist. But, even in this case, for individuals, society and political representatives who are responsible for the development of society there should be an authoritative precautionary principle, i.e. we can only carry out such activities where we are able to estimate reliably the consequences of our behaviour. Let us illustrate it by the following example:

Let us compare society to the occupants of a car that goes along the road without lights in the night. In front of us in the darkness there is a mountain. Some people believe that there is a tunnel through the mountain, i.e. it is not necessary to worry and we can go on. Other people are afraid that there might be no tunnel and they want to change direction or at least to slow down. The first group is willing to think of a change in direction only after it is totally clear that there is really no tunnel through the mountain. If the first group is wrong and there is no tunnel, things will turn out badly for us. If the second group is wrong and there is a tunnel, the car will only be delayed as a result of caution. In this comparison even time plays an important role. The longer we discuss and investigate whether there is or is not a tunnel, the shorter time we have for slowing down and changing direction. Applied to reality it means: freons have gone into the stratosphere for about 15 years or more and there they react with the ozone. The present depletion of the ozone layer is a consequence of freons emitted 15 years ago or more. Even if we stop their production and consumption today all over the world, for at least a further 15 but more likely more years the situation will not be better but worse.

Another attitude is to admit the seriousness of problems without trying to solve them. This attitude is, in our opinion, wide-spread above all amongst the general public. We are afraid of a catastrophe, but we do not believe we ourselves can do anything about it. We stay passive, "we cast our fate to the winds", we become, even unconsciously, fatalists. Or at worst we react according to the slogan "Enjoy yourself" as long as possible, snatch what is possible from the gifts of Earth and life regardless of the future. In this way we lose the instinct of self-preservation and we behave in a very cruel way mainly to our children and to future generations. We think it is the attitude of weak people and these are people who are satisfied to be members of a herd which likes to be driven, if only it is possible to snatch at least a bit of something pleasant and comfortable for themselves. One can disagree with the people of the first group, but it is possible, if they are sincere, to respect them. With the people of the second group it is simply impossible.

The third possibility is to try actively to influence and change the present adverse trends in the realisation of sustainable development or a sustainable way of life in an active way. A frequent and natural question following the mention of a sustainable way of life is "what is the chance of success?". We are afraid that nobody knows the answer. Even if the chance is only one per cent, it is worth trying it. In other words - we are not so much responsible for the final result, we are responsible for our effort.

The way of life of society is influenced by at least four basic factors:

35

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- the value orientation of the inhabitants;
- the economic system;
- the political system;
- the legal system.

We will start from the assumption that a market economy and a democratic political system are necessary preconditions for sustainable development. The market and democracy - the two basic corner-stones of a functioning society - must be protected by law and order, which is itself influenced and created by human values and safeguarded by a legal system. But we can see that a market economy and a democratic political system only function in some countries of the world. They have taken root mainly where people could live in a long period of material prosperity. Facing the looming global and regional crises we recognize that democracy and the market are fragile phenomena and they may not last for ever. The frustration of people (above all from poor, non-industrialised regions), arising from unsuccessful attempts to better the conditions of life, supports the self-interested and corrupt actions of ruling elites. The whole population becomes positively prepared to look for an outside culprit - e.g. the industrial countries and the international economic order enforced by them. In this situation only those ideologies are successful that promise to solve all the problems - with a little bit of violence and an enlightened dictatorship. But it can easily be changed into a "hard" dictatorship, ultra-right-wing or ultra-left-wing, whether with a communist, nationalist, ecological or fundamentalist religious ideology.

Therefore we consider a democratic political system (parliamentary democracy with gradually increasing elements of participatory democracy) and a market economy (which gives preference to the functioning of society according to general rules and principles over the specialized distribution of means or advantages by those people who have these means at their disposal) to be necessary.

When putting into practice a sustainable way of life, priority should be given to the following sectors:

- education and upbringing;
- telecommunications;
- nutrition;
- the restructuring of the electricity supply;
- the restructuring of agriculture (including the intensification of the landscape-forming function of agriculture);
- the restructuring of industry;
- transport;
- tourism and recreation;
- the safety of the state and its inhabitants.

These sectors, where above all investments from the state budget should be directed, were chosen on the basis of the expert evaluation of the mutual relationships and connections between 21 evaluated sectors that were described in the analytical part of the paper (see the chapter "Integration of sectors").

Now we will try to describe the meaning and influence of four basic factors and nine key sectors for the formulation and implementation of a strategy of sustainable development/way of life. Then we will mention some other aspects of sustainable development which we did not consider in the analytical part of this work but which should not be forgotten but developed further in the future.

Human Values

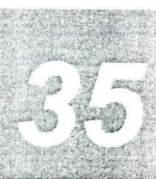
We can consider the value orientation of people as the most important but also the most difficult to define of all the basic factors. They influence the functioning of the political, economic and legal systems, but usually they change in the course of long periods of time (over decades or centuries). Stanislav Hubík says that the sphere of value orientation "is subject to inertia, it changes as slowly as possible and a revolution in value orientation is in progress "inaudibly" (Nietzsche), although it is the most revolutionary revolution".

In a simplified way we can divide value orientations into three groups according to the attitude of man to nature and the environment: the anthropocentric view (man is superior to living beings and nature), the biocentric view (it assumes the equality of all living beings) and the theocentric view (it assumes the existence of God - the Creator, man is the custodian of entrusted gifts). According to the 1992 survey (Ekorsa) the anthropocentrically-orientated group represents in the Czech Republic about 45%, the biocentrically-orientated group 30% and the theocentrically-orientated group 25% of people. Hardly anyone from the anthropocentric group announced man to be "the master of nature, who has a right to treat it according to his needs" - only 1% of the whole surveyed group were of this opinion.

It seems that in developed western countries there is a shift of value orientation in the direction of postmaterial values in the younger generation that has not experienced war. "Among this generation the aim of material acquisition, consumption and performance has declined considerably and on the contrary - especially in comparison with the older generation - there is a strong feeling of solidarity, a sense of difference, a concern for present-day global problems, "green problems" etc." (S. Hubík). In spite of the fact that in our country many people live a way of life which is an alternative to the consumer way of life, generally for the time being this tendency is not yet decisive (H. Librová, 1994).

There is a question whether our value orientation can shift in a "desirable" direction in a relatively short space of time. Negatively it is surely possible for value orientation and the behaviour of inhabitants to change quickly. Many present-day armed conflicts, when neighbours who had lived together for many years became enemies capable of committing terrible bestialities, can be examples. It is more difficult to find positive examples of a change in value orientation but we think that even these are possible to find. 150 years ago in the U.S.A. slavery was normal. Today, of course, something like that is unacceptable. 30 years ago in the U.S.A. it was difficult to imagine recycling on a wide scale, today it is totally normal and accepted by the population. So it is worth struggling for a positive change in the value orientation of inhabitants however small the chance is. The shift of value orientation can be caused by at least 3 factors:

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- a) Fear - a real fear of the consequences of our way of life can bring a change in the behaviour of man. But it is a forced, involuntary adoption of change.
- b) Personal experience - our own experience with the negative influence of a certain factor (e.g. the depletion of the ozone layer in the stratosphere) can lead to a change of behaviour.
- c) The vision of a positive solution - it is the opposite of the impact of fear, it gives hope from which the will to change our behaviour voluntarily can result.

Josef Vavroušek (1993) tried to define the key values of present-day industrial society that stimulate the creation of global and regional problems (values of type A) and he tried to add alternative values which would be compatible with a sustainable way life (values of type B):

1. Relation of man to nature

- A. Predatory, exploitative relation to nature.
B. Awareness of the relation to nature.

2. Relation of human individuals to society

- A. One-sided emphasis on individualism and competitiveness (typical for "real capitalism").
One-sided emphasis on collectivism (typical for "real socialism").
B. Balanced emphasis on the individual and the collective, the supplementing of competition with cooperation.

3. Relation to the passage of time and a sense of history

- A. Obsession with the idea of quantitative growth.
B. Emphasis on the qualitative development of human society.

4. Relation to the sense of our lives

- A. Hedonistic orientation and a consumer life style.
B. Emphasis on the quality of life, deliberate modesty and the self-denial of superficial things.

5. Relation to freedom and responsibility

- A. One-sided emphasis on human rights and freedoms, the erosion of common responsibility for public affairs.
B. Establishing of the symmetry between human rights and freedoms on one hand, and human responsibilities on the other hand and to develop both.

6. Relation to our knowledge

- A. "Pride in reason", resting on a one-sided emphasis on rationality and on the overestimation of the complexity, depth and reliability of our knowledge and our ability to foresee and shape future development.
B. Caution in all interference with nature and society.

7. Relation to our lives

- A. Our alienation from our own lives, the weakening of the human instinct of self-preservation and of the feedback that makes the correction of our inappropriate or unsuccessful action possible.
B. Re-establishment of the human instinct of self-preservation.



8. Relation to future generations

- A. Preference for short-term goals over long-term and permanent goals, life at the expense of future generations.
B. Awareness of the long-term consequences of human activities.

9. Relation to other opinions and to other civilizations

- A. Lack of respect for other opinions, ideological, religious, racial or other intolerance, and the attempt to solve problems by force.
B. Mutual tolerance, empathy for the situation of the inhabitants of other countries, solving problems by negotiation.

10. Relation to common issues

- A. Withdrawal from common decision making.
B. Development of participatory democracy unifying the advantages of representative democracy with self-government.

According to Josef Vavroušek to a great extent the future depends on how highly we rate type B values on the scale of our individual and group values and to what extent we suppress in ourselves type A values. It is a race against time.

The change of our value orientation and behaviour should be motivated by "positive pressure" - by a vision of hope, a positive solution and a way out. How much expectation and creative energy was released in Europe by the discovery and consequent settling of America! In spite of all the negative attendant phenomena it is admirable how the landscape of North America was affected and reshaped by human effort.

We believe that a similar hope and a vision of a positive solution releasing unsuspected quantities of energy can be brought about also by a well-worked-out strategy of sustainable development (or a sustainable way of life). It is an appeal to artists, scientists, politicians and interested members of the public on the eve of the 21st century and the third millennium.

If we want the life of man to have even in the future a chance to be lived in a dignified and creative way, we must attempt an essential change of value orientation and life-style. For the time being we are still too "hungry" for a higher material standard of living and consumption. But let us try to compare the development of human society analogically to the development of an individual (in biology the Haeckel rule applies: ontogenesis is a repetition of phylogenesis). For the 40,000 years the species *Homo sapiens sapiens* has been on Earth, mankind has tried to get out of a close dependence on its environment. We have always struggled with a shortage of food, with diseases and natural catastrophes, we have always felt endangered. Only in the last century did this (at least in developed countries) change. But in the same way as a man who has been starving for a long time tends to overeat, for us almost the sense of life is still prosperity, the acquisition of property and the opportunity to enter the long-desired "consumer heaven". We really have become masters of the Earth to a certain extent. We have the ability and the opportunity to use and destroy the resources of the biosphere. But it is also possible that man will recognize his power but he will in time admit his dependence on nature and on his environment. In the same way an individual develops from a child's dependence to rebellious puberty and then to adulthood, it is possible that our civilization is also going through the stage of "puberty". An individual wants to outgrow his parents, people feel a need to subordinate their environment. In this case, however, there would be a great deal involved at the

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present time. In puberty man can be easily hurt, he can hurt himself or others. And to cap it all at this age it is decided who he will be in the future. At best he will recognize his power which has outgrown the power of his parents, but after recognising this fact he will not misuse it. He respects his parents not as a child or an inferior any longer, but as an equal partner. So it may be possible to hope that the relationship between mankind and nature will be understood in a similar way.

Professor Josef Svoboda from the University of Toronto believes in *spiritual evolution*. For approximately two billion years inorganic evolution was in progress on Earth, transformations of the lithosphere, hydrosphere and atmosphere occurred. For a further two billion years biological evolution was in progress, from the simplest microorganisms, "the invention" of photosynthesis, the appearance of plants on land, through the development of invertebrates up to the development of vertebrates - mammals, primates and the first predecessors of man. For the last 40,000 years cultural evolution has been typical. "Wise man" (*Homo sapiens sapiens*) learnt to use more and more complicated tools and fire, agriculture, architecture, literature, philosophy, religion, science and technology started to develop, mankind headed towards more and more complicated socio-political self-organization.

Now we are experiencing (according to J. Svoboda) a problematic transformation, an ethical transformation, and we are heading for spiritual evolution. A renewed mankind will "awaken" into cosmic consciousness, it will be quite a qualitatively new stage in the development of mankind.

It is admirable what discoveries the physical sciences have led to and how many of these discoveries people have been able to use in practice. Nevertheless, even if it concerns a steam engine or an atomic reactor, it is still the exploitation of inorganic nature. Organic nature is qualitatively a higher form of existence. Biologically-orientated branches, such as biotechnology, genetic engineering, the medical sciences and also psychology can show the direction of the development of mankind in the 21st century. It is a great opportunity for mankind, but it is also a great responsibility and there is a risk of potential jeopardy, especially if we do not grow from present "puberty" into adult, confident, responsible and creative individuals, forming a transformed human "spiritualised" society.

After the explosion of the A-bombs in Japan on 6th August 1945 we maybe for the first time recognized not only what possibilities, what power, but also what responsibilities had been opened up for us by physics and its (imperfect) knowledge and mastery of matter. What possibilities, risks and responsibilities are opening for a spiritually awakening mankind?

The following shortened extract from the writings of Arthur Machen, quoted by Jacques Bergier and Louis Pauwels in the book "The Dawn of the Magicians" (1990) shows how serious threats and opportunities can open up before mankind entering the stage of "spiritual evolution":

"We either overestimate evil. Or we underestimate it. On one hand we call the breaking of social conventions and taboos a sin. It is an absurd exaggeration. On the other hand we attribute a great importance to "a sin" which means that we put our hands on our property or on our wives, that we have completely lost sight of everything that is terrible in real sins."

"But what then is a sin?", asked Colgrave.

"I must answer your question with other questions. What would you feel if your cat or your dog started to speak in a human voice? If roses in your garden started to sing? If stones on the road started to grow in front of your eyes? Well, these examples can give you a certain idea what a sin really is." ...

"You surprise me", said Colgrave. "I have never thought about all this. If it is true, than we must turn everything inside out. Then according to you the essence of a sin would be..."

"To want to attack the sky", said Ambrosius. "A sin dwells, in my opinion, in the will to get into a different and higher sphere in a prohibited way. Then you will understand, why it is so rare. Only a few people really long to get into different spheres, both higher or lower ones in a permitted or prohibited way. There are not so many saints. And sinners in the sense I understand it are even more scarce. And men of genius (who sometimes combine both in themselves) are also rareBut it may be more difficult to become a great sinner than a great saint."

"Because a sin is deeply against nature?"

"That is it. Sanctity needs the same or nearly the same effort but these are efforts operating in ways that were once natural. The thing is that man should again find ecstasy which he knew before his fall. But a sin is an attempt to reach ecstasy and knowledge that have never been given to man, and he who will attempt this will become a demon. ...Look, if good and evil are to the same extent out of reach of man today, ordinary, social and civilized man, then evil is even further out of his reach. A saint attempts to find again the gift which he has lost; a sinner attempts to get something which he has never had. In conclusion, he starts again with a fallOur higher senses are so worn out, we are so impregnated with materialism that we would certainly not recognize real evil if we happened to meet it."

"But in spite of this did we not feel a certain terror? The terror which you invoked a moment ago when you asked me to imagine roses which would start to sing?"

"If we were natural beings, then yes. Children, some women and animals feel this terror. But with most of us the influence of habits, civilisation and upbringing have suppressed and obscured nature. The materialism of our period that greatly helped to suppress sanctity maybe helped even more to suppress evil. Earth looks so comfortable for us that we long neither to go up nor down."

Economic System

"Economics tries to find and formulate laws with the help of which the economic activity of people is controlled in society. ...The inconsistency of the modern era is that man has managed to impart a motion to his abilities (development has never moved so quickly ahead as in the last 200 years), but spiritually he has become incredibly wild. ... In economics it manifested itself in the form of one-sided economic liberalism (we have in mind one-sided liberalism decayed to the level of egoism, not liberalism as such). Economics divided human life into economic and non-economic parts." (P. Boukal)

If the value orientation of people changes in the long term (decades), then the economic environment (conditions) can change relatively quickly. The change of value orientation is also an individual choice based on voluntary decisions and it will be typical for a more limited number of people (e.g. voluntary modesty, a shift from material values to post-material ones etc.). On the other hand if there is the political will to change the economic behaviour of society, firms and individuals with the help of economic tools, this change will affect essentially the whole of society and it will influence the direction of its development.

THE INCONSISTENCY OF
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THE MARKET ECONOMY IS AN ATTEMPT BY PEOPLE TO CONTROL THE ECONOMY ACCORDING TO GENERAL RULES THAT ARE NOT PARTIAL TO ANYBODY IN ADVANCE

In this century there used to be competition between two big economic systems. It was convincingly shown, how ineffective the system of central planning was in comparison with the market economy. In spite of the general characteristics of economics mentioned above, we must say that in spite of all the imperfections of the market economy we so far do not know anything better. The market economy is, according to the philosopher Václav Belohradský, an attempt by people to control the economy according to general rules that are not partial to anybody in advance. People with power have a natural tendency to "adjust" general rules and appropriate advantages to influential interest groups. It comes to light e.g. with state orders. As a reward they then expect support in further elections. The principles of the market economy are in this way permanently endangered.

The market economy, as it is so far understood, starts from the aim of constant economic growth which supports a consumer way of life. The best-known economic theories (the classical liberal monetarist market economy, the Keynesian market economy) also have other, above-mentioned drawbacks:

- they are strongly anthropocentrically-orientated (which usually leads to egoism and a feeling of power over nature);
- they start from a strictly rationalist understanding of man (the irrational, or spiritual side of human personality can be left behind);
- especially with less developed countries (and with countries which went through a period of communist rule), the condition of the full "moral" development of society, which is a precondition for the functioning of a classic money-market economy, is usually not fulfilled.

Therefore we consider that only an environmental economy, which starts, apart from anything else, with a different index of the effectiveness and "prosperity" of the national economy, as opposed to an economy measured by gross national product, can be viable and offer hope.

The economist Herman Daly and theologian John Cobb (1989) worked out an *Index of Sustainable Economic Welfare*, which tries to cover not only the effectiveness of the economy but also the quality of life and the state of the environment. The workers of London's The New Economics Foundation, Dr. Tim Jackson and Nic Marks applied their methodology to conditions in Great Britain. The following information is taken from the material "An Index of Sustainable Economic Welfare for the United Kingdom, 1950 - 1990", which was prepared by Ed Mayo and Alex MacGillivray (1994):

"Our central interest should relate to a better quality of life - the satisfaction of people's needs now and in the future - and the economic means to achieve this.

The gross national product which calculates the flow of money in the economy is regarded as the main indicator of wealth and progress. GNP is however a highly confusing index if we consider the quality of people's lives and the state of the environment.

The Index of Sustainable Economic Welfare (ISEW) is an indicator based on personal consumption, revised with regard to factors relating to social welfare and the quality of the environment.

When ISEW was calculated in Great Britain for the period 1950 - 1990, it was seen that "sustainable economic welfare" (per inhabitant) had risen only slightly (by 3%), while GNP had grown by 130%. Sustainable economic welfare reached its peak in the middle of the 1970's and since then it has been dramatically reduced.

If GNP rises, it still does not mean that the quality of our lives is improving. Health, the satisfaction of the individual, the quality of the environment, personal and collective security, all these contribute to the general quality of life and cannot be at the same time described by standard economic statistics. Nor are the unequal division of incomes and the value of housework included in the calculations.

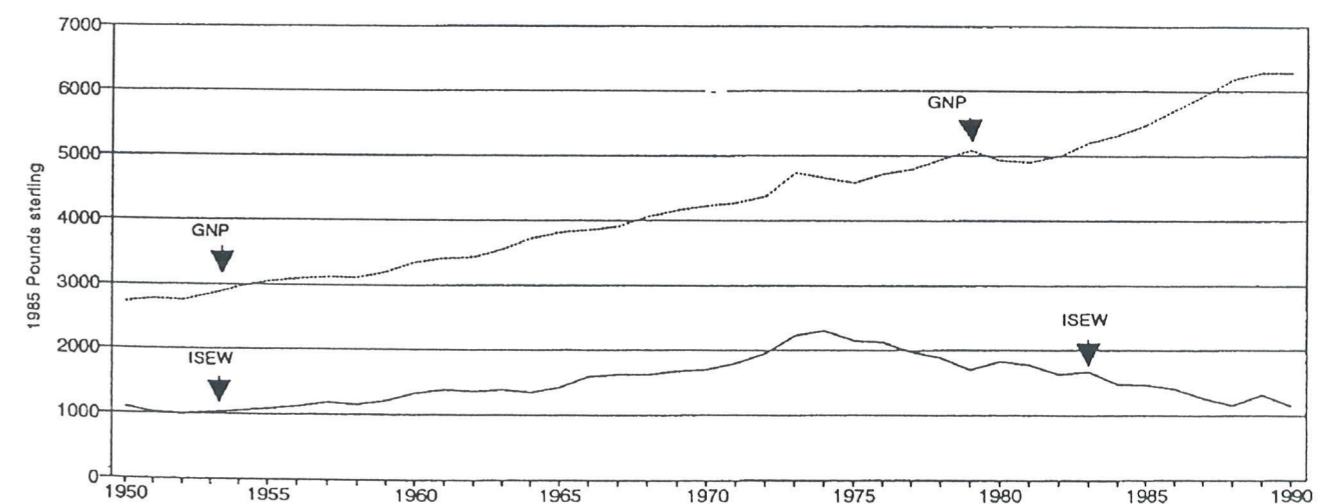
The increasing incomes of the inhabitants are more and more absorbed by covering environmental and social expenses. Some factors are not taken into consideration by the market at all such as the bad quality of the atmosphere and the devastation of natural resources, it is impossible "to buy" such items."

These reasons led to attempts to develop new indicators, which would better reflect the determination of sustainable welfare than is possible through the use of gross economic results.

The formulation of The Index of Sustainable Economic Welfare (ISEW) worked out by Herman Daly and John Cobb is an extremely promising development.

Chart No. 16 - The UK ISEW and GNP per Capita, 1950-1990

Source: Jackson, Marks in: Mayo, Mac Gillivray, 1994

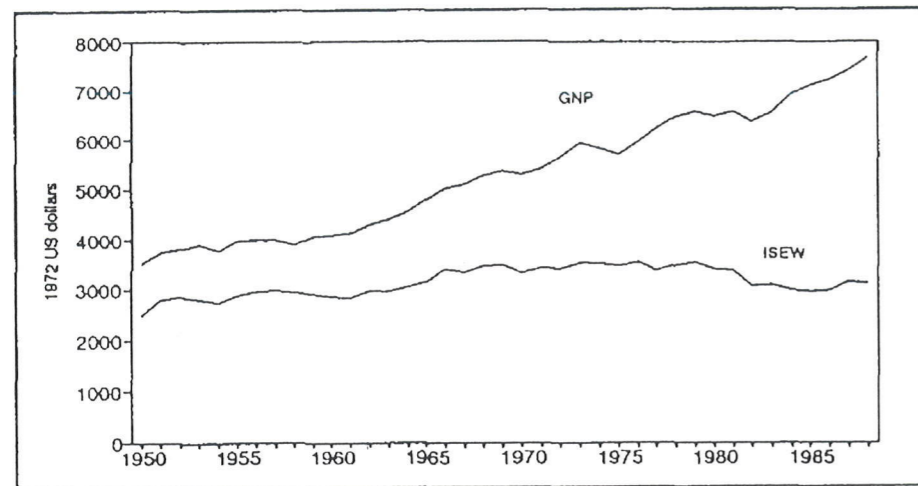


THE GROSS NATIONAL PRODUCT CALCULATES THE FLOW OF MONEY IN THE ECONOMY, GNP IS HOWEVER A HIGHLY CONFUSING INDEX IF WE CONSIDER THE QUALITY OF PEOPLE'S LIVES AND THE STATE OF THE ENVIRONMENT.

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Chart No. 17 - The ISEW for the USA, 1950-1990

Source: Daly, Cobb, 1989



Economic Tools

In economically developed countries the state sometimes intervenes in the free market. Partly because some parts of the biosphere cannot be owned by anybody and controlled responsibly (e.g. the atmosphere), partly because the market is not able to react to many phenomena from the field of the environment or its reaction is delayed (clean water in rivers has no "value", because no human work was put into it, only when e.g. a certain firm contaminates the water and another firm down the river needs top-quality water is it necessary to put work and resources into the cleaning of the river and the water can be evaluated from the viewpoint of cost).

An environmental economy tries to react to these inadequacies of the free market and tries to find a way to express in figures these "externalities" in economic expenses.

Economic tools for the care of the environment should be much more effective than administrative measures (because they define clear rules whose keeping is checkable and enforceable).

OECD has maybe the most worked-out classification of economic tools at the present time (taken from H. Kolárová, 1995):

I. Payments

1. Fees for the contamination of the environment (water, air, waste etc.).
2. Charges for the consumption of natural resources (raw materials, water, soil, forest etc.).
3. Administrative fees.
4. Tax for the protection of the environment.
5. Tax differentiation.

II. Subsidies and reliefs

1. Tax reliefs.
2. Grants, appropriations, gifts.
3. Low-interest loans.

III. Advance payments

1. Deposit-refund systems (encouragement to collect products that after use become dangerous or difficult waste - batteries, packaging etc.).

IV. The creation of the market

1. Marketable emission licences.
2. Ecological insurance.

V. Stimulation by compulsion

1. Payments for breaking the given limits.
2. Fines.

As was written in Hana Kolárová's study, taxes may become the most effective economic tool for the protection of the environment. Environment-orientated taxes could be much higher than ecological fees, which is why even the level of economic stimulation is higher. Taxes, unlike fees for contamination, do not need monitoring and they are better accepted by the public than fees.

Since 1st January 1993 we have had six kinds of tax in the Czech Republic, but a tax on the environment has not yet been accepted and it was refused by our government. Therefore desirable attention is not paid to ecological tax reform in our country.

Ecological Tax Reform

Ecological tax reform would concern first of all the taxation of fuel and energy. Now we use non-renewable natural resources (above all fossil fuels) in an unsustainable way. The sources of fossil fuels were formed over tens of millions of years and it is not important whether we will use them up in five, fifty or a hundred and fifty years. The consumption of fossil fuels is not only increasing exponentially, but these complex organic compounds are also used in the most primitive way - we burn them in a boiler or in an internal combustion engine, while in the future they could be used in the pharmaceutical, textile, food etc. industries.

Today the price of fossil fuels equals practically only the expenses of their extraction and distribution. We however should pay at least for three further elements: for using a non-renewable resource (and in this way the potential impoverishment of future generations), the carbon tax (through the burning of carbon, CO₂, the most important green-house gas, appears in the atmosphere) and a tax for the contamination of the environment (including the long-term use of soil when mining coal and consequent recultivation).

The taxation of fossil fuels and also other non-renewable resources would significantly increase the price of these resources. This however should be compensated for by reducing the price of labour (income tax and value added tax could be lowered). Hence the title "ecological tax reform" - the state would neither lose nor gain on tax, the total level of the tax revenue would remain the same. The non-renewable resources would become more expensive, mainly labour would become cheaper (it would positively influence the employment rate, above all in countries with a high unemployment rate). However also renewable (energy) resources could become cheaper (or could be subsidised). If the money collected

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THE TAXATION OF FOSSIL
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LABOUR



for the use of non-renewable resources was invested in the research and development of renewable resources, their technical parameters and price accessibility would be radically improved.

It would be interesting to compare, how much has so far been invested in the research and development of the nuclear power industry in our country and how much in the field of renewable energy resources. The implementation of ecological reform will be difficult, mainly because of the world price of fossil fuels. Above all the countries of OPEC are interested in extraction and exporting as much as possible (and having high profits), which is why the price of crude oil is kept low on the international market.

But today the situation with the price of energy in our country is completely illogical. Value added tax is 22% for most products, only for some, ecologically economical products (such as recycled paper, colours soluble in water etc.) is it 5%. However, value added tax on fossil fuels is only 5%, which preserves the present orientation of industry to branches which consume a lot of energy, it does not stimulate investment into more efficient and power-saving technology and leads to general wastage (energy is "cheap").

Ecological tax reform can also help to solve the basic problem concerning the consumption of non-renewable resources: how much non-renewable resources can we use, how much should be left for future generations? Strictly speaking, we impoverish future generations by mining each tonne, but it is clear that each generation will demand the use of natural resources. Herman Daly tried to define *three basic principles for the sustainable exploitation of natural resources*:

1. The level of the use of renewable natural resources will not be higher than the level of their regeneration.
2. The level of the use of non-renewable natural resources will not be higher than the level of the development of substituting renewable resources.
3. The level of emission of injurious matter into the environment will not reach the limits of the ability of the environment to assimilate them.

Another possible attitude to an admissible level of the use of non-renewable resources is the principle of at most one per cent use of known resources per year. If we had e.g. 100 million tonnes of known exploitable resources of coal, it would mean that during the first year we could exploit one per cent, i.e. one million tonnes of coal, but the following year only one per cent of 99 million tonnes etc. If new deposits were discovered and the total known exploitable resources increased e.g. to 110 million tonnes, we could exploit at most one per cent of 110 million tonnes, i.e. 1.1 million tonnes in the following year.

In conclusion, we would like to mention three examples of economic tools whose introduction would be desirable:

Programmes of trade with emission rights. In the U.S. the introduction of marketable emission licences led to the saving of tens of billions of dollars, it led to great savings of energy and to use of modern technologies. The state issues the emission limits for a certain region which guarantee a maximum allowable limit of emissions. Firms can trade with each other the allocated emission limits. A firm able



to reduce its emissions below the desirable limit (e.g. by buying progressive technology) can sell the emission credit. A firm, that exceeds the emission limits, can buy emission credits from other firms. The emission credits are gradually bought back by the state, in this way it gradually reduces the emission limit and the burden on the environment, and it forces the firms to behave better towards the environment.

The last two examples are taken from the book "Sustainable Development in Czechoslovakia" (Collectiv of authors, 1991):

The establishment of ecological banks. It would be necessary to establish e.g. ecological banks for depositing money in the state ecological funds. Among the basic duties would be the overall control of the funds of the environment, to provide help to polluters to trade in emission rights and provide loans. They should also encourage firms to implement programmes for the protection of the environment and monitor and evaluate this implementation. Ecological banks should try to obtain international help for specific plans of ecological investment by establishing international consortiums.

The insurance of ecological risk. The development of the free market will create a new market insuring against ecological risk. New insurance investments should be carefully monitored so it would not be possible to conceal the responsibility of polluters. It would be necessary to consider the introduction of obligatory insurance for firms that deal with toxic material and waste.

Political system

"The treacherousness of democracy is in the fact that ten aggressive sapsheads and ten decent people have the same weight at the ballot-box."

Fedor Gal

We start from the assumption that a necessary condition of sustainable development is a market economy and a democratic political system. We saw the influence of democratic and totalitarian systems on the development of society in a divided Europe for four decades after World War II. A totalitarian political system that did not admit criticism and therefore lacked feedback collapsed. In our own way we really were a light for nations, as communists used to say. We showed which way is impossible and other countries (e.g. developing countries) have a chance to draw a lesson from our painful experience.

There is an interesting comparison of totalitarian and democratic systems to two types of ecosystems, e.g. to a maize field and a meadow. Maize grows quickly and has a big yield. But the field must be constantly supplied with large amounts of supplementary energy (fertilizer, the application of protective chemical elements against weed etc.). Without these things and maintenance a maize field stops producing and comes to nothing, it is "swallowed" by competitive plants. A meadow, on the other hand, at first sight looks very ineffective. Various species of plants compete with each other, they struggle for space and access to light. But even if

the meadow is not worked (the supply of supplementary energy is stopped), it is able to function much longer than a maize field. Similarly a totalitarian system - in our country in the 1950's - was "nourished" by a then attractive ideology, later only by power. But when there was nothing which could nourish the system, and disgust and apathy, and with smaller groups even active resistance dominated, the system came to an end.

A democratic system with all its drawbacks, ostensible ineffectiveness and the clashing of antagonistic interests is much more viable and so far we do not know anything better. (A different question is whether the parliamentary form of democracy is the best possible form.)

A monarchy with an enlightened ruler at the head could seem to be promising. If a country was ruled by a wise monarch in the past, the country was prosperous and this form of government appeared to be very effective. Earlier "a king by Divine right" ruled - i.e. a monarch, a manager who was responsible for a people and a country entrusted to him by God. The difficulty is how to prevent an enlightened monarch under the pressure of power, glory and money becoming unenlightened, or to prevent his successor becoming unenlightened. (Disregarding the fact that even tyrants, who on their way to the throne killed or had many people killed, were proclaimed monarch "by Divine right".) So again there is no feedback, no safety measure which would be an effective check on power.

Let us go back to democracy. Democracy is, according to the philosopher Erazim Kohák, "in the history of mankind a rare and transitory phenomenon that is above all an attempt to accept personal responsibility for common things". A working democracy assumes a higher civil consciousness: the willingness and ability of all the citizens to question not only their own wishes, but also the needs and the good of the whole.

Erazim Kohák explains the fragility of democracy with the example of the tragedy of the commons:

"Let us imagine a common able to feed a hundred sheep. On the common there are ten farmers grazing ten sheep each. But each of them only looks after his own sheep. He is not aware of the common as a whole. He only knows how much easier his life would be if he had at least one more sheep. And the common is so big! One sheep would make no difference. So he adds another. Each of the ten farmers thinks and does the same. But the common is not able to feed 110 sheep any longer. They overgraze the common and all of them die of hunger. Nobody wanted it. Everybody wanted just one more sheep - a modest wish.

The tragedy of the common is an unwanted, unforeseen consequence of modest wishes.

The possibility of social coexistence is based directly on a bird's-eye view that is willing to take into account not only its own wishes, but also the need for the common good. Where there is no such bird's-eye view, there a tragedy is going to happen." (Kohák, E. in Nováček, P., Vavroušek, J., 1993).

In 1989 in Czechoslovakia, democracy, more precisely parliamentary (representative) democracy, was re-established. Parliamentary democracy is a way of governing where the majority decides. Jaroslav Kapr (1991) says that one of the

central problems of such a political system is the role of a representative. How can we choose a suitable smaller group of people who would represent the interests, have the power and speak on behalf of a great number of people?

When the majority decides there is also a danger, that this majority may not be always right and can misuse its power against a minority. Another problem is to a certain extent the monopolised access to information and the monopolised right to make decisions, which lower the possibility of the checking of professional representatives by the public.

For our country, according to Fedor Gál, there are some specific problems of the culture of power. These are (for details see the chapter "Political System"):

- the ideologisation of power;
- the delegation of power;
- the rhetoric of power elites;
- power exercised through the media;
- checks on power.

What can be done about it? One possibility is to attempt to apply the participatory principle. The participatory principle as a way to increase the culture of power does not consist only in the fact that citizens - regardless of their professional roles - are involved in political events, but also in the fact that it represents a way of active social learning.

It means that efforts at consensus are important and this is possible where the point is the solving of actual problems. Fedor Gál goes on to state that the principles of tolerance and complementarity are navigatory principles. And dialogue involving people of various identities, opinions about the world and nationality is an instrumental background for the application of the principles of tolerance and complementarity:

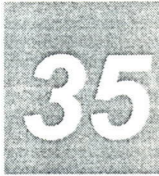
"In this way an open society appears, in which the fact of the autonomy of the nations, ethnic groups, communities and social groups is understood as a natural state. That is because the autonomy of each individual is also understood as a natural state. But openness, if it is not to be destructive, presupposes the certainty that it will not cause chaos. Stability in openness is possible to characterise also by a necessary level of intolerance, with strict rules and the authority of the law and institutions. Democracy can be a dangerous weapon in the hands of a crowd if there is no respect for the authority of the law. In the end the law itself can be a weapon in a leader's or majority's hands."

What are the chances of citizens preventing the misuse of power?

"There are people", says Fedor Gál, "who can see the Universe and society as a strictly and hierarchically well-ordered whole, in which everything has its eternal given place. For others the world is a changeable stage, on which they move on the basis of their own choice and their own decisions. For the former, participation in power is actually a call for a strong-arm government (authority, tradition), for the latter it leads to a call for a government of dialogue, that can under the patronage of the law define space for living together in the intricate jungle of human interests.

DEMOCRACY IS IN THE HISTORY OF MANKIND A RARE AND TRANSITORY PHENOMENON THAT IS ABOVE ALL AN ATTEMPT TO ACCEPT PERSONAL RESPONSIBILITY FOR COMMON THINGS

DEMOCRACY CAN BE A DANGEROUS WEAPON IN THE HANDS OF A CROWD IF THERE IS NO RESPECT FOR THE AUTHORITY OF THE LAW



People who understand the jolly mosaic of living worlds are able to perceive also the complementarity of these worlds, they can be tolerant towards the attitudes, values, needs and aims of others."

So parliamentary democracy prevents a monopoly of power, which is very important. But at the same time it is not completely immune from potential abuse by a manipulated crowd and there is a risk of the abuse of power by minorities of specialists or professional politicians. Participatory democracy is one of the possible ways to eliminate this danger.

The participatory principle has been discussed for more than twenty years. It is a method of government in which the public in particular cases make decisions (or at least take part in making decisions) themselves. Participation in decision-making was questionable in the past because it was impossible to ensure the physical presence of citizens at a certain place at a certain time. But this is becoming less and less true thanks to the vast development of telecommunications and computer networks. Today it is technically possible for the inhabitants of a town, a region or even the whole republic to take part in negotiations and decision-making concerning questions which relate to them through the means of communication. So the development of telecommunication and the entry of society into the postindustrial (i.e. information) era enables and supports the development of participatory democracy.

Jaroslav Kaspar (1991) defines five levels of participation in decision-making and gives a simplified example of professional ("representative") and partner ("participatory") decision-making.

The stages of participation in decision-making:

1. participation in working out and evaluating variants of decision;
2. the right to be informed and to inform before a decision, take part in its preparation;
3. the right to obligatory consultation when making a decision;
4. direct participation in decision-making;
5. the right to veto a variant of a decision or the whole decision.

For example:

The government intends to make decisions about the energy policy of the country. The task is to analyze historically the actual conditions, to judge various solutions, to give some of them priority, to weigh the possibility of combinations of suggested procedures etc. The point is to evaluate their accessibility, economic, ecological and social utility in short-term and long-term perspectives, their mutual interchangeability etc.

The professional attitude: The government sets specialists (e.g. from the ministry of the economy) to evaluate the task. They will compile a report that would after discussion in the government and after minor revisions be submitted to parliament as an expert opinion to be discussed. Here it would again, after small changes, be approved and the public would be informed about it. A citizen is understood here as a unit, that has fulfilled its role by the delegation of the discretion to make decisions



to its representatives. The structure of solution has from the very beginning the character of an authoritative decision of an body accepted on the basis of consultations with specialists. The voice of a citizen is not regarded as contributory. The fact that he has no knowledge, experience, qualification, perspective and responsibility would be to the detriment of a thing. Therefore it is not usually the habit of the general public to ask to express suggestions or attitudes, but at the same time there are even no technical conditions that would make it possible. Channels of communication are constituted in such a way that only officially competent organizations have the possibility to use them.

The partner attitude: A government that wishes to make a decision about the conception of a solution to the energy problems of the country would invite the public as well. Because the majority of citizens lack the necessary specialist information, it would organize short-term free courses in which everybody who would like to take part in decision-making, learns about the advantages and disadvantages of different suggested solutions, or can suggest another variant. A plebiscite about the results of such a nation-wide event would be held. This time a citizen is understood as a unit which does not delegate its competence to make decisions but tries to use it directly. They assume that citizens have information and experience which can be reasonably used when making decisions. Their view is taken not as something useless but as the useful view of a person with a different profession.

J. Kaspar stated that technical development in communications and the treatment of information have made it possible that a way of direct participation in decision-making has become one of the regulation mechanisms which limits and checks the monopoly of professional minorities that decide and also it motivates and creates the conditions for the democratisation of the access to and the treatment of information.

According to Petr Kuzvart (1993), there are specific forms and elements of participatory or direct democracy that it would be possible to consider in our conditions:

Referendum - is the decision-making of citizens by direct voting on constitutional-political or legislative questions, or on a general political matter of home or foreign policy. Especially in Switzerland the referendum is used in practice and it works. There is given a list of questions that need to be decided with the help of a referendum and the holding of referendums is itself quite frequent. In the constitution there is a rule that any federal law or generally obligatory regulation must be decided through a referendum if at least 50,000 Swiss citizens entitled to vote or 8 cantons ask for one.

A referendum can be national, regional or local.

If the referendum is to be a working tool of direct democracy, effectively complementary to the representative principle, it must be workable in practice and without too many limiting conditions. But on the other hand it is necessary to avoid a possible "inflation" of referendums which could lead to the apathy and passivity of citizens.

Plebiscite - to a great extent it overlaps the institution of referendum. There are two understandings of plebiscite:

a) a wider conception - it is a form of direct democracy with the help of which citizens directly decide by voting on a particular state-political question, e.g. on a form of social order, on separation or the independence of nations;

b) a narrower conception - it is a voting of citizens only from a certain part of the state about whether this part of the state will continue to be a part of the state or whether it will be joined to a neighbouring state. It is a way of solving international disagreements.

The institution of people's initiative - is a duty given by law to obtain the support of a certain number of eligible citizens for a pertinent suggestion. If this condition is fulfilled, it is necessary to decide on the suggestion or to accept it. It is a people's lawmaking initiative which however is not legally based and so it is not admitted in our country. In the Czech constitution subjects that are the bearers of lawmaking initiative are determined: a representative, a group of representatives, the Senate, government or a board of representatives of a higher (so far not formed) self-governing territorial unit.

The submission of initiative suggestions - suggestions that are not submitted by institutional or public authorities but by a citizen, groups of citizens, citizen's associations, petition committees and political organizations.

Referendums and plebiscites are elements of direct democracy which usually are of an imperative character, i.e. with the help of them the decision-making is obligatory. Beside those there are also elements of a consultative character:

Public opinion surveys - they are organised by the authorities (e.g. local) to find information which is needed for a decision. In fact it is an expert investigation of public opinion.

The right of petition, which is one of the basic rights of a citizen, is close to the consultative elements of direct democracy.

Public consideration and negotiation of matters before a decision is taken - in these cases under certain conditions or at a certain phase of the decision-making process anybody can on one hand obtain all the relevant information about a given matter and on the other hand can express an opinion before the decision is made.

Law No. 244 from 1992 about the environmental impact assessment admits and defines "citizen initiative" as a certain association of citizens which is not a legal entity, but for the purposes of the evaluation of influences on the environment this initiative has certain particular features of legal subjectivity. The forming of such a citizen's initiative involves in practice only two steps: collecting at least 500 signatures of citizens supporting the corresponding expression of public opinion and the appointment of a representative.

The provisional power of the people - as Petr Kuzvart mentions, democracy, which is not able to defend itself when endangered, has no future. Therefore in the Declaration of basic rights and freedoms there is article No 23: "Citizens have the right to resist anyone who would abolish the democratic order of human rights and basic freedoms, established by the Declaration of basic rights and freedoms, if the activity of the constitutional authorities and the effective use of legal means is made impossible." Article No 23 of the Declaration of basic rights and freedoms is a

constitutional basis for possible campaigns of civil disobedience, when state bodies fail for some reason and a citizen as a last resort of sovereign power takes this power directly into his hands.

The development of the non-profitmaking sector and non-government organisations is typical for the increasing importance of participatory democracy and civil society. For non-government organisations and among them above all ecological and environmental organisations, that are very well-organised around the world and also in our country, the development of horizontal or net partner structures is typical, instead of hierarchical ones (applying the relationship of subordinate and superior) which is typical for government organisations. Non-government organisations today often manage to be more than equal partners to government institutions when negotiating important questions thanks to the effectiveness of their activities, professional background and personal involvement and all this despite very limited finance.

In spite of the fact that the concept of participatory democracy has been known for more than 20 years, its importance is not completely clear and we are not able to imagine what opportunities the adding of elements of participatory democracy into parliamentary democracy could provide, and in what other, non-traditional forms it can be done. In conclusion therefore we will give some thoughts and topics of the well-known american futurologist Alvin Toffler (1980) who is interested in the transformation of society from the industrial phase into the postindustrial phase. This transformation, according to him, will bring, among other things, a great development of participatory democracy:

The institution of representative government (one man one vote) is characteristic for the industrial era. It enabled the weak and the poor to call for concessions from the "technicians of power". It was a humanising turn in history, however elites were not done away with. Elections have become a ritual of the consolidation of confidence. Representative government is the equivalent of a factory that produces collective integral decisions. In the U.S. each year there are 45,000 pages of new regulations, 27 government organizations monitor 5,600 federal regulations concerning the production of steel alone. It produces a huge bureaucracy. Legislation does not work and the sense of responsibility is lost. People do not feel angry but averse to and contemptuous of government. This brings the danger of calling for an authoritarian government which "will introduce order".

But civilisation in the postindustrial era needs a completely new quality of government (so a good feudal monarch would be a very bad representative of the industrial era). The weakness of present-day leaders is not in their personal qualities, but a consequence of the disintegration of institutions on which power depends. In the postindustrial era (Toffler calls this era "the third wave") not the power of the bulldozer but the power of the imagination will win through.

Governments are divided into sections, in particular departments or ministries. Then they are not able to clarify the relationships and mutual connections between departments, they are not able to create integrated programmes. Governments react by the further centralisation of power. Great acceleration of changes and decisions occurs. The acceleration of changes has overtaken the decision-making capacity of our institutions.

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IT IS NECESSARY TO FIND
NEW INSTITUTIONS, AS
WAS DONE BY THE
FOUNDERS OF THE U.S.
200 YEARS AGO, AND IT
CONCERNS NOT ONLY
THE RESTRUCTURING OF
GOVERNMENT BUT ALSO
SUPRANATIONAL
ORGANISATIONS, LOCAL
COMMUNITIES ETC.

Also national unity, the unifying idea of countries is being lost. Thousands of interest groups (from local ones to international ones) appear.

In this way the third wave attacks the basic assumption of the political theory of the industrial era - the concept of representation. The structure of institutions today was formed before Marx, Darwin, Freud and Einstein. It is necessary to find new institutions, as was done by the founders of the U.S. 200 years ago, and it concerns not only the restructuring of government but also supranational organisations (UNO etc.), local communities etc.

According to A. Toffler three political principles will be characteristic for the democracy of the Third wave (the postindustrial era) in the XXI century:

a) The principle of the power of minorities. In the 3rd wave the masses and classes (in Marxist understanding) lose their importance. The principle of minority starts from increasing variety.

It is necessary to find new attitudes for the democratisation of minorities. Voting with the aim of obtaining a majority says nothing about the quality of the opinions of particular people. During an election not only a "yes - no" decision, but also preference, intensity and the order of choices should be recorded. People may be (at least partly) chosen for representative authorities through voting or random choice (as in the U.S. army when being drafted).

Another variant is that chosen representatives will have 50% of power, the rest, i.e. 50%, will be held by a randomly chosen sample of the public. With the help of computers and surveys of public opinion it is possible to update this sample and also decision-making from one day to the next. In this way the influence of the interest groups and lobbyists would be eliminated. Only when a law was created and approved would the classically elected board of representatives work on it.

b) Semi-direct democracy. It is a shift from dependence on representatives to dependence on oneself. (Toffler considers direct democracy to be e.g. a French commune, therefore he understands participatory democracy as a "semi-direct democracy".) In the past the means of communication were not suitable for this method of governing. Today the means of communication enable us to take part directly in decision-making (e.g. with the help of two-way television, with the help of computer networks etc.). A couple of years ago in the city Columbus (Ohio) the so-called "electronic city hall" was tested - with the help of cable television citizens can express their opinions on solved problems, they can even directly participate and they represent themselves in this way. The Swedish government, on the other hand, when formulating an energy policy, invited citizens to participate. It launched a ten-hour television course about the power industry and then each Swede could make a recommendation to the government. They expected the participation of 10,000 people but nearly 80,000 people took part.

Another possibility is to launch a referendum on a certain question. A decision would rest 75% on Parliament, the remaining 25% (or less, according to the strength of public opinion) would rest on a national referendum.

c) Division of decision-making. This is a shift of decision-making to where it should be (according to the principle of subsidiarity - the solving of the problem at the lowest level possible).

35

Today the system of decision-making is most worked-out on the national level. But a state is not able to cope with e.g. multinational corporations. Therefore it is necessary to shift a part of decision-making power not only downwards (to regions and the citizen), but also upwards, to supranational groupings and global organisations, supported by groups of non-government organisations.

The behaviour of institutions in the future may be changeable, depending on conditions. E.g. in the future the army may in peace-time be democratic and participatory but in war-time or a state of emergency highly organised and authoritarian. So institutions can have a greater "repertoire" of organisational structures and roles.

In conclusion we can sum up by saying that for an increase in the importance of participatory democracy there are many preconditions today in comparison with the past: developed communication systems, good education and material affluence (it refers to societies entering the Third wave, i.e. postindustrial societies). But to change something, energy alone is not enough, also imagination and vision and a goal to aim at are necessary.

A developed personality, a man able to create and make decisions independently and responsibly is a precondition and at the same time the target of participatory democracy.

Legal System

(Based on the material by Eva Kruzíková and Václav Mezrický - for details see chapter in analytical part of the study.)

"The people should struggle for the laws of the community as if they were its bulwark."

Herakleitos

Good, practical revision of the law is one of the preconditions of sustainable development. In the course of the last five years, in environmental law it has been possible to find three basic tendencies:

1. the formulation of good, new laws for the protection of particular elements of the environment;
2. the issuing of a general legal regulation covering the field of the protection of the environment;
3. the issue of legal norms modifying new democratic elements which came to light in the protection of the environment.

The framing of the Czech Constitution was a great chance to lay down not just the principles for the protection of the environment, but especially the principles of sustainable development. It has not been possible to establish the necessity for the Constitution to express itself explicitly on the question of the environment. But it is important, that the Constitution of the Czech Republic determines that the Declaration of basic rights and freedoms is a part of the constitutional order of the

35

Czech Republic. This document embraces article No 35, guaranteeing the right to a favourable environment and the right to information about the environment.

The passing of the law concerning the environment No 17 from 1992 was a fundamental step in the legal revision of the protection of the environment. It is based on the principle of sustainable development and involves, among other things, the precautionary principle.

It is not easy to try to outline what law and order, based on the principles of sustainable development, should look like. But we can start from some commonly accepted principles:

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SUSTAINABLE
DEVELOPMENT

1. Law is one of the basic tools of ecopolicy to establish the relations of sustainable development. It is necessary to understand law as a way of defining new values which are the result of the gradual recognition of the importance of nature, the environment and natural resources for the existence of man, human society and culture.

2. Czech law will be influenced by some conditions that will essentially determine its shape:

- global problems and the kinds of responsibility of particular states defined by the world's comity (e.g. the threat of a change of climate);
- regional problems and regionally defined responsibility;
- national problems and interests;
- local problems and interests.

3. The tasks of the law in connection with the environment should be determined by the orientation of ecopolicy (orientated towards applying the principles of sustainable development). Legal regulations, economic tools and organisational measures are the basic instruments of ecopolicy.

4. National legal systems, including Czech law, will be essentially influenced by the documents accepted at the UN conference in Rio de Janeiro (especially the Rio Declaration and Agenda 21) and further international activities and documents (such as The Earth Charter).

Adherence to the precautionary principle, the preservation of biological diversity, the preservation of the values of the environment and natural resources, the priority of sustainable development over short-term special interests, the participation of the public in decision-making about environmental problems, the responsibility of the state, the prevention of damage caused to other nations and the Earth as a whole will be stressed in environmental law.

In particular the principle of the responsibility of the state is very important. In the Czech Constitution the duty of the state to protect the environment and natural resources appears in not so clear and explicit a form. At the same time it is undoubtedly true, that in the field of the protection of the environment (similarly as e.g. in education or health care) the state must explicitly guarantee the condition of the environment and the basic value of nature.

Protecting particular elements of the environment, and especially natural resources, it is possible to expect the growth of conflicts between the traditional understanding of property rights and the postulates of sustainable development. The basic legal definition of property as an unlimited ascendancy over things in modern society is not true any longer. Property should be used for the benefit of a wider whole, it should not serve only the interests of the owner. In this connection it will be necessary to develop a theory of "the ecological function" of property.

The Constitution should explicitly acknowledge that nobody is a sovereign master over the natural resources which he owns. Property rights must be applied in a way that neither the environment nor natural resources would be endangered or damaged. It is especially true about the protection of life-giving systems such as wetlands, forest ecosystems, arable soil etc.

It will be necessary to define the role of town and country planning as a tool for the protection of the environment. The legal revision of town and country planning should define the conditions for the orientation of economic and social activities in such a way that no areas with valuable countryside will be damaged.

The development of environmental law in the developed countries (and also at the international level) is heading towards the formulation of consistent codes for the protection of the environment. It is an opposite development to that followed by the Czech Republic. It is inevitable for the set of regulations of environmental law in the Czech Republic to lead to a similar legislative change.

5. The participation of the public in decision-making about environmental problems is of fundamental importance. It will be necessary to modify definitely the form of "hearings" of these organisations, or their representatives before specialist boards of the legislature, especially before committees which are concerned with environmental problems. The change of these committees into committees for sustainable development is acceptable assuming that their appropriate powers will be defined.

Knowledge in the field of the environment, i.e. the question of the right to information and access to it is closely connected with participation in decision-making.

Key sectors

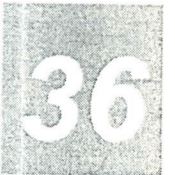
When putting sustainable development into practice, we consider certain sectors as strategically important and deserving priority attention. All sectors were analysed in the first part of the study, here we will give only a concluding summary.

Education and Upbringing

Education and upbringing condition the development of human potential. It helps man to develop into a creative, developed and confident personality. It is of fundamental importance in determining how far our society will be prepared and

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36



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able to enter the postindustrial, information era. It would be sad if we were determined to enter only as service personnel through our own fault.

So far education has been understood above all as a question of school. But this is not true any longer. Attention will have to be paid not only to pre-school upbringing and suitable forms of education but also to "pre-natal" upbringing. We still do not sufficiently recognise that life starts nine months before birth and the health and behaviour of both parents essentially influence their child, including how they think and how much they look forward to the child.

The next problem is the excessive emphasis on the rational in education and the neglect of the emotional side of upbringing. School is still reminiscent of an impersonal factory producing pupils and students. It seems that alternative schools, which try to counterbalance these disadvantages and lead pupils to individual, creative and spontaneous expression, will develop.

Above all, in the higher grades of school an interdisciplinary attitude, that would, at least to a certain level, abolish the present-day system of the compartmentalisation of subjects into individual disciplines should be effected. It will be difficult to find a balanced relationship between the necessary specialisation, that will enable a discipline to be studied in depth, and the generalisation, that will help to convey and understand the mutual relationships and connections between fields.

The support and the development of after-school activities for young people will be of great importance. Here at least a part of the responsibility should be taken over by the state. Until there is a much better opportunity for sensible and attractive out-of-school activities (e.g. through new sport facilities and cultural institutions), the young generation, for whom parents will have no time and society will make it clear that it is not interested in their problems, will fall into boredom and despair, it will be unable to answer the basic question - why am I actually here, and it will start to drink, to take drugs and to find other ways of escape from reality. Later it will begin to be felt, among other ways, in a rise in crime in society.

Non-government special-interest organizations can help essentially in after-school education and upbringing. E.g. The Scout Movement (in our country Junák) was founded in England to help to prepare young men for future service in army corps in the colonies. It is clear that today Junák could and should find a new role which would be connected with different activities. Could one of them be, for instance, the care of the environment? But then it would not be important to learn Morse Code but to learn to understand how nature functions and how we should behave towards it. A good basis for this kind of understanding of the sense of the Scout Movement could be to follow up the heritage of the founder of the Czech Junák, A.B. Svojsík, who as early as the beginning of the century concentrated his efforts on the protection of nature.

Also the last essential thing which we will mention here - the understanding, classification and evaluation of intelligence - is connected with the problem of education and upbringing. Since 1948 the position of the educated class in society has worsened drastically, including their salaries. Their social prestige has been decreasing all the time which is strikingly visible e.g. in the contrast between the past and the present status of teachers, above all in villages (if they still have a school and a teacher).

Telecommunications

Investment in telecommunications is of great importance for the future development of the national economy. Its importance for the functioning of society is analogous to the importance of the nervous system in the human body. It is impossible to calculate how many quality foreign investments we have lost and how many partners we have discouraged by our out-dated and in many cases non-functioning telecommunication network.

It is a pity that practically up to the present day the conception of the development of telecommunication has not been cleared up, that its privatisation is problematic etc.; six years after the revolution, the words of the governor of the Czech National Bank Josef Tošovský, that in some regions telecommunication is "a bottleneck in the economy" tying up its further development, are still true. In some places businessmen still phone and transact their business in the evening, when circuits are not overloaded and for some surgeons in some hospitals a call to the next building still takes 20 minutes to be put through.

Telecommunications condition the entry of our society into the postindustrial, information era. There is quite a clear analogy with the development of railways in the industrial period. Towns, which had been important earlier and which were bypassed by the railways, lost their importance. A similar decision is being made today, when the American vice-president Al Gore suggests the construction of "an information super highway" (a computer network that will enable practically anybody to get through to anybody anywhere), about whether we will be connected to the information super highway in time, together with other developed countries. The fundamental consequence, connected with sustainable development, will be the fact that the functioning of society will more and more depend on non-material activities, or at least on the activities which are not so demanding as far as raw materials and energy are concerned. A greater demand, however, will then be made on human resources, human skills, imagination and creativity.

The construction of a quality telecommunication infrastructure and the consequent involvement in the forming of the global information super highway will be financially demanding. South Korea is preparing in the next 15 - 20 years to invest tens of billions of U.S. dollars in the construction of an information super highway. Even we must make a fundamental decision. Either we will join this trend of the developed world and find funds which will amount to annual investments of tens of billions of Czech crowns, or we will remain a second-rate country that provides an industrial service to the most developed countries in classical industrial fields.

Nutrition

Nutrition is essential for human health (together with other factors, such as the environment, genetic predisposition, the physical and psychological state of an individual and social background). But the nutrition of the inhabitants is still not systematically monitored and its influence on the health of the inhabitants still has more the character of an expert guess.

TELECOMMUNICATIONS
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INFORMATION ERA

36

Nutrition also essentially influences our agriculture. In the second half of the 1980's in Czechoslovakia about 12 million tonnes of wheat were produced every year, but out of this total only 2.5 million tonnes were used for feeding people. About 8 million tonnes were used as fodder for animals (it is necessary to feed 5 - 7 kg of wheat to an animal to produce 1 kg of meat).

So if Z. Brázdová suggests reducing the consumption of meat in 2010 to 65 kg per inhabitant per year (in comparison with 102 kg per inhabitant per year in 1990), it will also fundamentally influence agricultural production (and through it also the quality of the environment) and the importance of the non-foodproducing functions of agriculture.

We think that the state should have its own nutrition policy and it should influence the individual eating habits of the inhabitants (as it does in e.g. Canada, the Netherlands, Finland etc.). It should first of all initiate and support nutrition education and upbringing at all levels of education. If the inhabitants have no basic nutrition education, they will become very manipulable with the help of adverts (which do not guarantee the quality and suitability of the goods offered at all).

EATING HABITS ARE
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Eating habits are influenced above all by the price of food, its accessibility and marketing methods (especially advertising). According to Z. Brázdová, the state could accept some responsibility for healthy eating through the tax system (to give preferential treatment to the production and selling of healthy food), legislation (labelling food with respect to the protection of the health of the consumer, limits for extraneous elements in food etc.), or through price regulation or state subsidies for some commodities (fruit, vegetables, low-fat milk) and higher taxation for other commodities (alcohol, tobacco).

The Restructuring of Agriculture

In the past the mainly *productive function* of agriculture was understood and food was considered as "strategic raw material" under socialism. We tried to be self-sufficient in the production of food at the cost of great investments and huge energy consumption. Enough food, especially meat and the products of animal husbandry was also felt as a coefficient of a satisfactory standard of living (so food to a certain extent replaced the unsatisfied demand for quality commodities).

Today in our agriculture there is an over-production of food although this sector is still going through a complicated process of transformation.

In the first years after the revolution, there was great pressure to break up the cooperative farms. Today it seems to be certain, that in our republic there will co-exist above all two organisational forms: private farmers and agricultural cooperatives (which may be transformed into public limited companies). Transformed agricultural cooperatives function, at least in many cases, well beyond expectation. In comparison with private farmers they have several advantages, that are not usually stated:

- they make it possible for workers to work eight hours per day;
- the whole family is not tied to agricultural work;

36

- cooperatives are, as far as capital is concerned, much stronger and more resistant to unexpected changes, e.g. when there is a poor crop because of bad climatic conditions, to changes of prices on the market etc.;
- they have a stronger negotiating position with partners (e.g. with businessmen, with the food-processing industry) than single farmers.

Israeli "kibbutzes" are an example of working "cooperatives", that could be an inspiration for us and that should be studied.

Working cooperatives could play an important role in the restoration of villages and the countryside.

Agriculture has besides a productive function at least two more functions whose importance is increasing: a landscape-forming function and a social one.

Landscape-forming function - a farmer or a farm-worker should be jointly responsible for the state and forming of the landscape, for how it is exploited. But this assumes that the state will contribute to farmers for the care of the landscape differentially according to natural conditions, and that it will consider them as "gardeners" who take care of the landscape (with the exception of the forests). It means for instance to provide subsidies for the mowing of meadows in the hills, subsidies for growing certain plants, for the planting and care of biocentres, biocorridors and inter-active elements (within the framework of the territorial system of ecological stability) or only for letting a certain plot in a certain period lie fallow. Working, aesthetically valuable countryside, suitable e.g. for the development of agrotourism, is an asset.

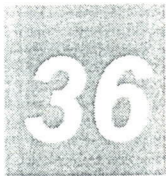
Social function - it is maybe not possible to deny that the former political regime made a positive attempt to balance the standards of living in towns and villages. Nevertheless in many regions (especially in frontier and mountain ones) depopulation of villages occurred and is still occurring. People have neither enough work opportunities, nor enough possibilities of social and cultural life. This trend however should be stopped if we accept that we want a cultivated, functioning countryside and more decentralised settlement.

In the future it is possible to expect an outflow of part of the population (mainly educated people) from town to country - first of all to satellite areas, later even further. The value of a quality environment, contact with nature and a way of life without urban rush and stress will be emphasised. The advantages of towns - culture, access to information etc. - will be to a certain extent eliminated by the development of telecommunications and a good transport network.

In rural districts we should try to preserve and create new opportunities for work - whether in the form of sidelines as parts of cooperatives, or by the development of crafts and small businesses (food, wood-working industries etc.). In crop husbandry, the growing of crops with a technical or energy application (in the climatically suitable regions) such as flax, rape etc. will be intensified.

There may also be some important shifts between forest soil and agricultural soil resources (i.e. more agricultural soil will be shifted to forest soil resources). The non-timber producing function in the forest economy will be more important and a better natural age and species structure of wood will be intensified. But in chosen

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localities, timber species could be grown in very intensive plantations (including fertilising). It would be possible to grow in this way mainly biomass for energy reasons.

The Restructuring of the Energy Industry

The energy industry in our country after World War II was developed in connection with the construction of heavy industry. If we give the size of the production of fuel and energy in 1948 as 100%, then in 1981 this figure had risen more than twelve times (to 1240%) and in 1989 it was already 1530%. The mining of lignite in 1990 was about 90 million tonnes, the mining of bituminous coal was approximately 25 million tonnes. But since that time there has been an important fall in production.

Resources of lignite in this country are estimated at 28 - 35 years, resources of bituminous coal at 25 - 30 years (and uranium at 90 - 140 years; its annual production is about 800 tonnes).

We produce a disproportionately large amount of energy. Therefore the basic "source" of energy in our country should be a cut in consumption. We could cut the consumption of energy according to various calculations by 30 - 52% through the restructuring of industry, a change in its orientation, the introduction of modern technologies, by improving the insulating properties of building material and buildings etc.

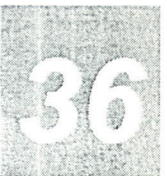
Besides these most striking savings, there could be many other particular savings, caused e.g. by the fact that our agriculture has turned away from the intensification of production (based on high supplies of supplementary energy), and intensification is, at least partly, replaced by a qualitatively higher level of development, i.e. by ecologisation. The proof is the quick development of alternative (biological) agriculture and the demand for agricultural products grown without the use of chemical elements in the last couple of years.

In transport a broad-minded modernisation of railways, even to the detriment of the development of the road network and the problematic river transport, would again cut the consumption of energy.

Alternative Sources of Energy

Solar, water, wind, geothermal energy, the use of biogas, the processing of biomass and alcohols as a fuel are renewable sources, often considered to be unimportant and secondary. At the same time these resources are decentralised (there is no loss in transferring energy), accessible from the financial and capacity viewpoint to firms, and ecologically acceptable.

E.g. the growing of rape and the production of bio-oil and biological oils solves several problems at the same time: it makes it possible for farmers to grow plants with quite a good anti-erosion quality and a good sale, from an energy point of view it contributes to a higher representation of renewable resources and it ecologically influences the consumption of bio-oil and oils in transport - if it leaks into the soil, it is not a problem (unlike crude oil materials). Based on world experience and on calculations made in the Centre for the Effective Use of Energy in Prague and also



based on our own calculations, we think that it would be possible to cover 25 - 35% of the present consumption of energy with renewable resources.

It would be suitable to compare how much has been invested in the construction of big power stations (above all nuclear, supported by the pressure groups of industrial corporations, and how much has been invested in the development (including research) and construction of alternative renewable resources in the last few decades and especially recently since the revolution in our country.

The Use of Non-Renewable Resources

About one third of the consumption of energy, which we will not be able to cover by savings and renewable resources, is possible to get above all by the purchase of natural gas. When using quality technologies, it is the fuel with the best potential to replace lignite and also atomic energy. Besides the so far stable supplies from Russia and the central Asian republics it is also possible to negotiate with other partners in the Near East and in northern Africa.

We do not consider the consumption of nuclear energy as suitable and viable in the future. Among many other reasons for and against this resource, it is possible to give three reasons against nuclear energy which we consider to be fundamental:

- a) The life of an nuclear power station is about 25 - 30 years, but spent fuel will be strongly radioactive for thousands of years. The problem of safe storage has not been solved in any country in the world yet, which is why we put a heavy burden on future generations.
- b) The human factor. An nuclear power station can be technically the best, nevertheless personnel can always fail and endanger the best safety system. Therefore the risk of an accident (even very small) is still there and in our conditions (geographical location, density of population) even a potential risk is considered to be unacceptable.
- c) As a result of the construction of a new nuclear power station (in this case Temelín) there is for a time enough or even too much energy, which leads to the maintenance of the present state of industry, that is orientated towards branches with a high consumption of raw material and energy. Industry, orientated towards the primary processing of raw materials and their export, does not stimulate the need to develop "human potential" and ranks us among semi-developing countries that provide by their heavy industry a service to the developed, post-industrial countries.

BASIC "SOURCE" OF
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The Restructuring of Industry

After World War II the Czech economy was orientated towards the priority development of heavy industry and for other, less developed socialist countries we, together with former East Germany, became "the smithy of socialism". The physical volume of Czechoslovak industrial production in the first thirty years after the war grew 1.5 - 2 times quicker than in most industrially developed countries. At the end of the 1980's Czechoslovakia had at its disposal the biggest industrial potential in the world per inhabitant.

The quantitative growth of industrial production, however, was accompanied by technological backwardness (as a result of the orientation of industry towards eastern markets and the lack of competition). Therefore even today the productivity of labour in industry is about 60 - 70% of the average in European countries and about 40% of the average in the U.S.A. Not such a long time ago, the production sphere used nearly two thirds of all material production simply to keep working.

Another negative factor is the high concentration of industry in several regions, above all the Ostrava, Prague and Chomutov - Ústí regions.

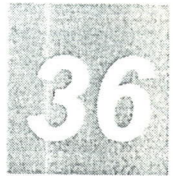
The need for the restructuring and decentralisation of industry is therefore a big challenge.

In our country there are the following main industrial branches: metallurgy, the chemical industry and the machinery-tool industry (including the armament industry).

Some branches that are more progressive for us (paper-making, polygraphy, branches of precision engineering, light chemistry etc.) are not represented enough in international comparison. Among other potentially successful branches, there could be the pharmaceutical industry, the food industry, the wood-working industry, the ceramic and glass industry, the building industry and maybe also the leather and boot-and-shoe industry).

Though nobody calls for the return of central planning through the State Planning Committee, there is no fundamental strategic decision concerning the role the state would like to play in control of the development of industrial branches with the help of economic tools. We lack an expert decision on which industrial branches (if possible less demanding on raw material and energy and more demanding on skilled labour) will be supported and developed. These strategic decisions are common in the world and are of great importance for the development of society.

Then on the state and regional levels we need to have worked-out strategies and programmes of regions which will be fundamentally affected by the restructuring of industry. The question concerns not only the Ostrava and Chomutov - Ústí regions but also the Plzen, Pardubice, Prague etc. ones. Especially in the first two regions there will be not only a great change in the professional orientation of workers, but also a countryside that was devastated as a consequence of mining coal will change. It is not necessarily a disadvantage. With plenty of imagination and state and regional support, the countryside of North Bohemia and the Ostrava region can be positively changed into a functioning and habitable countryside. The inspiration could be the countryside of the Trebon region - in the Middle Ages it was a hardly



habitable area of swamps, later changed by people and still habitable today and even proclaimed as a preserve and included in the network of international biospheric reserves.

Transport

Transport has for the functioning of society an importance analogous to the cardiovascular system for the human body. The former Czechoslovakia was of strategic importance in transport from an international point of view due to its geographical location. To a certain extent it is true also about both succession states. We have from the past dense, well-constructed rail and road networks, in spite of the fact that this network has been technically neglected and is in need of modernisation and the quality of services provided is (above all on the railway) problematic.

Rail transport, either passenger or freight, is from an ecological point of view the most acceptable and it should become the basis of a new transport connection also on an international scale (on the European continent the rail network of highspeed trains will compete with air transport). The opposite trend is now true in our country and that is a pity. From the viewpoint of sustainable development, the development of railways is a priority in the field of transport.

Road transport since the revolution has been going through a stormy development and from a short-term point of view it seems to be the most suitable - it is comfortable, quick and relatively reliable. Nevertheless when taking into account the ecological cost to the countryside, the damage caused by accidents, the demand for parking lots in cities and other secondary expenses, its advantage is questionable (according to the research of Eurobarometer, carried out in Europe at the request of the Commission of the European Community, 54% of Europeans complain about immoderate road traffic and they consider it the most important problem at the local level).

The strategic decision in the field of road traffic will be, what basic networks of motorways we want and need. One possible suggestion is to finish constructing the network of motorways to former regional towns, with connections to the main international roads with two or three lanes in each direction. This state, however, should be considered final, otherwise a denser road network usually causes denser traffic, which again will cause an increase in the number of lanes and so on, ad infinitum.

Some countries, that have gone through this process, realise it is a deadlock and they have started to limit road traffic, above all international lorry traffic (e.g. Switzerland, Austria). Even in our country, fees for transit should be increased and international lorry traffic through our territory should be uncompromisingly transferred to the railway.

Car traffic is (unfortunately) felt as a symbol of social position. But drivers should pay the full cost of road use - including a tax for using a non-renewable natural resource connected with petrol and diesel oil. The development of auto-rental offices (with the support of the state) could become profitable. For many people it could be an acceptable compromise between the comfort which is provided by a car and the financial demands and ecological aspects that are against buying a car.

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36

But a sufficiently dense and good quality network of auto-rental offices is a precondition.

In towns, public urban transport should be supported and its stagnation should be overcome. It is true, that electrified public urban transport is not so clean as it seems to be at first sight (the electric power used is produced in another region in power stations, that contaminate the environment), nevertheless it is a better alternative than roads jammed by cars to which life in towns is subordinated. In connection with the attempt to have a healthier way of life in town (especially those towns situated on plains) cycling will develop. Its development, however, depends a lot on the willingness of local authorities to support the construction of cycling paths.

Tourism and Recreation

Tourism and recreation are the world's most important areas of the economy, only after them are there other branches, such as the car, chemical or armament industries, electrical engineering and machine-tool industry, that contribute to the growth of gross domestic product.

The development of tourism is very important for our country. Thanks to foreign tourists, it brings in international currency and it counterbalances what would otherwise be a severe deficit in the balance of foreign trade. Tourism, thanks to our natural beauties and cultural and historical monuments and also our geographical location, is the branch with the greatest potential to produce wealth, provide employment and be acceptable from the viewpoint of sustainable development.

But in the very near future it will be necessary to consolidate the infrastructure and quality of services - accommodation, catering, transport and telecommunications etc. It is also desirable and necessary to encourage and support the diversion of a part of tourism into towns and regions that are not so well-known yet, though nevertheless very attractive and with great tourist potential (this includes towns such as e.g. Kutná Hora, Olomouc and regions such as the Bohemian-Moravian Uplands). The language competence of the inhabitants is important for the development of tourism too.

MAINLY IN RURAL, BORDER
AND MOUNTAIN REGIONS,
SOFT TOURISM AND
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BE DEVELOPED

Mainly in rural, border and mountain regions, soft tourism and agrotourism should be developed. These forms of tourism do not create a great anthropogenic pressure on the countryside, they lead to greater contact with local inhabitants and better recognition of their way of life (it can also hide some dangers - tourists trying to "fuse" with the local inhabitants for two weeks a year can appreciably damage their way of life, not only inspire and enrich themselves).

After forty years of "abstention" it is good to encourage our citizens to travel abroad, especially if these journeys are instructive or educational. By opening up to the world, young people especially gain self-confidence, they will be able to be more sensitive towards the present problems of the world and they will be more willing to take part in their solution. So far we are too wrapped up in ourselves (mainly because of the language barrier), we suffer from provincialism.

36

Internal Security

(Based on the material by P. Krivka - for details see chapter in analytical part of the study.)

The function of the police is to protect the rights and freedoms of individuals, their physical and psychological integrity and the inviolability of their property.

The change of political system and the consequent opening of the borders led to a rise in crime. Our territory has become a part of the Balkan drug route. Various forms of international organized crime have started to come into our country. It is likely that a former attempt by our government representatives to tempt financial capital into our republic and an unwillingness or inability to ascertain the origin of the money (so-called clean and dirty money) had a hand in this.

Our territory is no longer only a transit for drugs, it is also becoming a market. The total number of thefts of cars and robberies, including thefts and the consequent export of artistic and historical artefacts, has steeply increased. White-collar crime is developing, especially in the area of economic frauds. There are more and more crimes against the labour laws and computer crime is spreading. Above all with organized crime, the use of brutal violence is growing.

Therefore it will be necessary to start a discussion about how much citizens would be willing to abandon their rights in exchange for an increase in safety and a decrease in crime.

But for the time being everything indicates, that crime will go on increasing, the number of policemen and the means to fight crime effectively will continue to lag behind the rise in crime. This is very dangerous. Besides the immediate damage, also trust in the functioning of and respect for law and order are damaged. And a democratic system is explicitly based on the functioning of the respect for law and order.

So even in the question of internal security, it will be necessary to look for a balance between the freedom and responsibility of the individual and to revise some humanist ideas. E.g. the wide application of the right to banking secrecy clashes with the right to ensure safety, property and health.

The misuse of rights and freedoms starts to threaten the whole of society. The level of crime is highest in countries with the most extreme emphasis on individuality and competitiveness (e.g. in the U.S.A.).

The police must fulfill two roles - repressive and preventive. The police fulfill a repressive role only towards about 3 - 4% of citizens. Towards the rest of the population, it fulfills the role of protection or (it should fulfill) a service role. Today the police lack 4,000 men on the beat alone (by increasing the establishment safety in towns would increase), in the frontier guard and immigration service there are another 3,000 policemen too few. It is again a strategic decision by the state whether it is willing to invest in the reinforcement of the strength of the police.

OUR TERRITORY IS NO
LONGER ONLY A TRANSIT
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THE LEVEL OF CRIME IS
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COMPETITIVENESS



CRIME PREVENTION PROGRAMMES SHOULD BE DEVELOPED, BECAUSE PREVENTION IS MUCH CHEAPER THAN THE FIGHT AGAINST THE INCREASE IN CRIME

Basic changes will take place in two directions - on one hand in closer cooperation with the public, on the other hand by greater attention paid to serious criminal offences and organized crime. The fight against (and the prevention of) petty crime should be to a greater extent the business of local authorities (citizen's initiatives). These authorities will to a great extent concentrate on prevention.

Crime prevention programmes should be developed, because prevention is much cheaper than the fight against the increase in crime. The results are, however, evident only after a long time - after five or ten years.

In the field of prevention, there is the limitation of the negative influence of the mass media, especially on the younger generation (above all of television and video) and it may be necessary to introduce a certain form of restriction.

But family upbringing plays a basic role in crime prevention. With a rise in the number of offences committed by young people there is the influence of the negative orientation of society towards hedonism and the consumer way of life. When parents are too busy and financially well-off, the children often get used to the fact that the overwhelming majority of their wishes are satisfied without trying very hard. If later it is not possible for them to do that in the same way, a young person feels it as an injustice and loses all inhibitions against crime.

If our present serious situation is not solved in a fundamental way (by investing in an increase in the manpower and equipment of the police, by strengthening the powers of the police even at the price of a certain limitation of the rights of citizens, e.g. in the field of banking secrecy), there could appear local attempts at an extreme solution - the forming (or hiring) of armed vigilante groups and also the further reinforcement of racist tendencies in our society. The above-mentioned danger can be increased by a flood of refugees from the East and the Balkans, continuing unemployment and the criminality of gypsies.

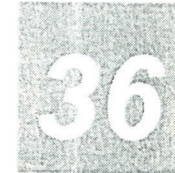
Generally it is possible to expect pressure to increase sentences as a deterrent. It is likely that the former conception of punishment as educational and punitive will be replaced by the idea that it is more a fulfilling of justice (this view understands a man as a person capable of managing his own affairs, who, on the basis of his inner freedom, is able responsibly to determine his behaviour).

It will also be necessary to simplify the paperwork connected with less serious crimes and to shorten in an essential way the waiting time between bringing in a verdict and carrying out a sentence.

It would be useful to introduce the confiscation of property as a right of recovery for some kinds of criminal (e.g. for smugglers and drugs traffickers).

The police should be able to keep part of the money they receive (as fines or from letting) for their own development (and not to hand it over to the state), as happens with local police. The effectiveness of the police will increase, if part of the powers of the centre is decentralized to the regions (now there is the opposite trend).

In prisons the situation is critical. Prisons are on one hand overcrowded, on the other hand some offenders admit that they commit crimes because they can live in better conditions than outside. The reintroduction of the duty to work should be a fundamental measure. Other possibilities are alternative punishments and town



lock-ups for short-term punishments, but again with a duty to engage in work beneficial to the public. This presumes the establishment of the institution of municipal judge, who would decide punishments in speeded-up proceedings in court. Also the construction of new prisons may be a necessary alternative. All this should help potential criminals to be aware that they will be caught, sentenced, in a short time they will have to settle by working valid claims (or at least a part of them) to make good the damage done and also pay for the expenses of their stay in prison.

The basic precondition of the protection of society against crime, however, seems to be the re-evaluation of the one-sided emphasis on human rights towards a balance with responsibility towards other people. According to surveys of public opinion it seems that a certain limitation of rights and freedoms in exchange for a greater level of safety would be acceptable for the majority of the inhabitants.

Back to Natural Cycles

People use resources of raw material and energy that we can simply classify as inexhaustible and renewable (e.g. water), inexhaustible and non-renewable (e.g. solar power), exhaustible and renewable (e.g. forests) and exhaustible and non-renewable (e.g. fossil fuels). In the first half of the 1990's we in the Czech Republic extracted e.g. 60 - 70 million tonnes of lignite every year (at the same time about 17 times as much spoil must be moved), about 23 million tonnes of hard coal (the mining of coal is however gradually slowing down), 5 million tonnes of lime and 23 million tonnes of building stone.

It would be desirable for us to approach as closely as possible to the *economy of nature*. In ecosystems no wastage occurs, materials are re-cycled and only a part of the energy (its source is sunshine and the energy of the Earth's core) is lost irreversibly in the form of radiant heat. So far we are a long way away from it. In the Czech Republic we produce annually about 180 million tonnes of waste, of which 33 million tonnes are stored in dumps. Nearly 90% of about 5 million tonnes a year of communal waste is stored in dumps. (Proceedings: "Waste 95").

According to various estimates in our country there were in total 8,000 - 15,000 dumps before the law on waste No 283 from 1991 was passed. At the beginning of 1995 in the Czech Republic, there were 249 suitable operating dumps (the costs of one such dump are estimated at 30 - 50 millions crowns), a further 54 dumps were in various phases of preparation and 1,450 dumps were run under special conditions (their operation should be stopped by 31st August 1996). There are the following fees for suitable and secure dumps (rate I, in crowns per tonne):

1. Soil and spoil	0
2. The rest (without soil and spoil)	10
3. Solid communal waste	20
4. Special waste apart from dangerous and communal waste	40
5. Dangerous waste	250

Our classification of dangerous waste is a problem. Waste dangerous for human health is defined as waste which shows at least one of the following features:

- a) acute toxicity;
- b) serious irreversible delayed effect;
- c) serious local caustic effect;
- d) the possibility of the transfer of serious infection.

Dangerous waste represents 16% of the total production of industrial waste. In Europe the Czech Republic is in first place after the former Soviet Union as far as the absolute quantity of produced toxic waste is concerned. The basic reason is the categorisation of waste, in which power-station fly-ash ranks among dangerous waste (Benes: "The Environment in the Czech Republic and Europe", 1995).

The percentage share of particular sectors of the national economy in the production of waste are as follows: ("Year-book of the environment of the Czech Republic", 1990):

Mining	83.7%
Industry	7.5%
Energy industry	4.1%
Building industry	3.7%
Slurry	0.4%
Communal waste	0.4%
Agriculture	0.1%
The rest	0.1%

There is the following structure of communal waste: paper 10%, plastic materials 6%, glass 8%, metals 6%, organic substances 40%, the rest 30%.

Besides dumping, the incineration of waste is done to a great extent in the Czech Republic. According to J. Plavec (Proceedings: "Waste 95") in our country there are 370 incinerators of waste but the heat produced as a by-product of the incineration of waste is used in a minimal way. Most working incinerators are technologically out-of-date and work without the appropriate chemical filtering of the products of combustion. About 90% of these facilities do not satisfy the requirements for incinerators for special and specially dangerous waste.

In our republic there are about 40 new incinerators, fulfilling the emission limits of the law on the protection of the atmosphere. These are however technical facilities with a small capacity for a particular firm to deal with its own waste. On the other hand some incinerators can be used too much. E.g. the Brno incinerator, which is not used to capacity, today is used for the incineration of waste from Ostrava and Znojmo, but also 20% of the waste is brought even from Prague which means great transport costs and also the cost to the environment because of traffic.

With the help of incineration the mass of waste is lowered to about one third and the size to about one tenth. It is illogical, that the fee for the storage of one tonne of incinerated waste in a dump is 250 crowns, while for normal communal waste it is 20 crowns per tonne.

Cement rotary furnaces in selected cement works, but only after technological modification, are one of the possible regional facilities to neutralise certain kinds of dangerous waste.

OUR CONSUMPTION OF ENERGY AND RAW MATERIAL PER UNIT OF GROSS DOMESTIC PRODUCT IS 2 - 3 TIMES HIGHER IN COMPARISON WITH DEVELOPED WESTERN-EUROPEAN COUNTRIES

Above all the energy industry and industry as a whole suffer from the heritage of recent decades when we were unfortunately orientated towards heavy industry. Our consumption of energy and raw material per unit of gross domestic product is 2 - 3 times higher in comparison with developed western-european countries. It is also a reason for the high level of the exploitation of energy and raw material resources and consequently also a high production of waste. This situation is no longer tenable. There must be a fundamental change in consumption (willingness to be more restrained and economical, orientation towards the quality of the utility features of products and maybe also the consequent taxation of advertising, the support of recycling and by legislation making it the duty of a producer to buy back his own products after use - e.g. some car factories are able to construct a car all the parts of which it is possible to recycle). It is connected with a change in value orientation and so it is a long-term matter.

However it is immediately possible with the help of state intervention to stimulate industry to introduce products which will be ecologically economical, "from the cradle to the grave", and to prolong their service life.

An ecological machine-tool industry and ecological chemical industry should be supported (especially in Central and Eastern Europe this field is not so far fully covered by foreign competition and provides a chance for a viable, export-orientated development in these branches).

Similarly, through state intervention and with the help of economic tools, we should support the introduction of ecological technologies, first of all:

- technologies that are more economical as far as raw material and energy are concerned;
- technologies using renewable resources;
- technologies with small and recyclable waste;
- cleaning technologies.

An example of the practicality of these ideas is Japan that has made a successful export article from environment-orientated industry and technology. On the other hand our country is periodically threatened by the accusation of ecological dumping from the European Union (e.g. in the field of metallurgy). The orientation towards "comparative advantages" on international markets - on cheap labour and ecological dumping - ranks us among the less developed countries.

We have mentioned that natural ecosystems can be examples for us of an economy without waste. Professor Straskraba tried to identify what principles can be taken over by ecotechnology from the functioning of ecosystems and what lessons we can draw from the behaviour of ecosystems (a lecture at the seminar STUZ - Society for Sustainable Living - in 1994). These are:

- minimalized energy waste;
- a closed cycle of matter;
- the preservation of structures;
- the preservation of genetic information which enables anti-entropic growth;

- ecosystems are more sensitive towards outside influences (they are open systems);
- the influences of one part of a system have unexpected consequences in a distant part of the system;
- they do not exceed the ecosystemic homeostatic assimilative capacity;
- they use ecosystemic adaptation for strategies of control (self-organization of ecosystems).

We are used to infinitely trusting science and technology and the perfection we have achieved in processing and using matter. But in comparison with what is happening unostentatiously, almost invisibly but more effectively in nature, we are only at the very beginning with our science and technology (and our respect for organic and inorganic nature should correspond with this fact). Finally one example for illustration (B. Plesko, 1992): "In nature we could find everything. The turbo-jet engine? Octopuses "have used it" for millions of years. Ultra-sonic radar? This "is owned" by bats. Perfect thermoinsulating material? What else but ordinary orange peel. Night vision is used by totally unerring cockroaches during the night and no computer is able to create a more perfect aerodynamic shape than has been made by Mother Nature herself in the shape of the winged sycamore seed... .Or, not such a long time ago, we e.g. did not yet know that the ordinary human muscle is the most perfect engine which it is possible to create. Its perfection is represented by its 95% efficiency, while the most perfect internal combustion engine is only 35% efficient."

Landscape-Ecological Evaluation of the Czech Republic

We have tried to apply a conception which assumes the division of the territory of the state into regions on the basis of natural, economic and social criteria and historical development.

In our country there are many studies dealing with the evaluation of the landscape, which classify to a certain level complex natural or socio-economic regions, dealing with e.g. the questions of the potential of the landscape, the evaluation of the landscape etc.

Therefore the aim of our efforts was not the compilation of yet another study similar to previous ones, but to put together a study integrating various attitudes, various criteria and ways of evaluating the spatial characteristics of the landscape.

With regard to the need for the re-evaluation of a large amount of, above all, map data, we have chosen a method of processing and evaluating data - the digitalisation of map data, its processing and further evaluation with the help of geographical information systems (GIS).

GIS's are modern computer programme systems that enable preservation, classification, processing and many other operations with spatial (map) data.

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Analytical Part

The main goal of this part was to create a set of special maps of the natural components of the landscape, that should serve as input parameters for further evaluation. The maps were created by the digitalisation of existing background data on a scale of 1:500,000 to 1:1.000,000.

We divided the analytical phase into three main blocks, in which we created in total 22 maps of landscape components.

1. A set of analytical maps of the landscape's natural components

The main task of this section was the creation of a set of special maps of the landscape's natural components, that should serve as input parameters for further evaluation (the potential of the landscape and the ecological quality of the landscape). In total 10 maps were created:

- geological substratum;
- basic soil types;
- elevation;
- slope gradient;
- basic relief types;
- mean air temperature (July);
- mean air temperature (January);
- mean year precipitation;
- potential natural vegetation;
- actual land use.

2. A set of analytical maps of the landscape's socio-economic components

The aim was to create maps of auxiliary socio-economic parameters that characterise individual regions and at the same time enable the deepening of knowledge about individual sectors evaluated in the study. In total there were 8 maps:

- nationality of the population;
- regions of commuting to selected work centres;
- atmospheric pollution by sulphur dioxide;
- atmospheric pollution by dust;
- polluted water streams;
- pollution of water resources;
- nature protection;
- protection of water supplies .

3. Landscape regions

The landscape regions were worked out on the basis of natural parameters (marking off natural types of landscape) and on the basis of socio-economic parameters (marking off agricultural, industrial and socio-economic regions). This enabled us to mark off complex regions of landscape, which are presentable from the viewpoint of the further evaluation of area preconditions for sustainability.

The following four maps were created:

- natural types of landscape;
- agricultural regions
- industrial regions;
- socio-economic regions.

Synthetic Part

The aim of the syntheses is to propose a strategy of the future use of the landscape which would be in agreement with the main principles of sustainability - i.e. to preserve the landscape quality and its components and at the same time the quantity and quality of natural and social resources even for future generations.

1. The Integration of Particular Features of the Natural Landscape - Stability, Carrying Capacity

The landscape (in a geographical sense) is for man the place where he lives and where he satisfies his material and, in part, spiritual needs. The geological substratum, relief, soil, water, air, vegetation and the animals are considered to be its basic components. They create together the complicated time-space system of the landscape sphere.

Our aim was to express *the resistance of the landscape* in the sense of the constancy of the connections between natural landscape components and the ability, with the help of inner mechanisms, to balance the outside influence of man on the landscape and its components in order to preserve the essential characteristics of the connections.

In this context it is often possible to meet the concepts of "the stability of the landscape" (structural stability), "landscape carrying capacity", and "the vulnerability and resistance of the landscape".

Huba (1984) dealt with *structural stability*; he says that, from the viewpoint of landscape, the understanding of *the dynamic balance* (homeostasis) of a landscape system is the most suitable and he stresses the role of negative feedback and the self-regulation of the landscape. The landscape is a system able to compensate for interference in its structure through self-regulative mechanisms, however, only up to a certain limit. By overstepping this limit, the reproductive cycles are broken, the productivity of the landscape decreases and qualitatively new relationships are established.

Drdos (1990) and Drdos, Kozova (1991, 1992) have summarised the problems of *ecological carrying capacity*. They consider carrying capacity to be a strictly specialised characteristic of a landscape, expressing the level of the possible overloading of a landscape system by anthropogenic activities without breaking its structure and the reproductive ability of its resources. Usually three basic kinds of carrying capacity are distinguished - natural (biophysical), behavioural (social) and ecological (environmental). Natural carrying capacity is understood as the ability of a natural ecosystem to bear a level of exploitation, in which unfavourable ecological changes would not appear (the gist of the matter is the determination of the critical threshold at which abiotic and biotic components of the landscape are changed by the influence of anthropogenic activity). Behavioural carrying capacity means human perception and its relationship to the environment (e.g. the perception of the environment by the inhabitants of a certain area). Environmental (ecological, complex) carrying capacity investigates the complex manifestations of human activity and the functioning of society in a certain area.

2. Sources and Productivity of the Landscape

For people, landscape is their environment, necessary for survival and development. From this point of view it is possible to consider chosen phenomena and characteristics of landscape to be *natural resources*.

The term "*productivity of the environment*" is closely connected with the existence of natural resources. Generally it is necessary to distinguish between natural productivity (given by the characteristics of natural components and the relationships between them) and artificial productivity (conditioned by outside inputs - supplementary energy). People by their activity increase the natural productivity of the landscape due to great expenditure on input, but they also cause the breaking of natural connections, the creation of disharmony and a threat to the stability of the landscape (Huba, Ira, 1994).

So the use of the landscape's natural productivity with the minimisation of supplementary input is in agreement with the need for the preservation of landscape stability.

Landscape potential is usually understood as a concrete form of the more general concept of landscape productivity. Drdos (1992) sees the difference between natural resources and natural potential as the difference between the concept of "resource" which refers to a material component or energy and the concept of "potential" which refers to an area of the environment.

The understanding of man in a homocentric sense (man as a part of the environment) and not in an anthropocentric sense (man as the master of the environment) should be important in the research of potential. From this point of view it is possible to use the environment for the functions for which it has natural preconditions given by its structure and only to the extent to which it is allowed by the stability or resistance of its system, given by the character of connections between its components (Huba 1984, Drdos, 1992). So the concept of "*natural landscape potential*" (landscape potential) takes into consideration the natural preconditions of landscape when using it, while the production and survival possibilities of man are limited by the character of reproduction cycles and the vulnerability of the landscape structure (Huba, Ira 1994).

3. Environmental Risks, Overloading and the Threat to the Landscape

People by their everyday influence change the properties of the natural landscape. It is possible to classify this process as a permanent conflict between landscape stability and productivity. It is possible to define the level of the intensity of anthropogenic activity as the level of the overloading of the landscape.

It is important for the level of overloading not to exceed the tolerable level, beyond which irreversible changes in the components of a natural landscape system and relationships between them take place.

Drdos (1992) points out the need for environmental research of the landscape orientated towards the needs of people. The problem of *natural hazards and risks* is one side of such research.

The risks can result both from natural properties and relationships in the landscape (volcanic activity, earthquakes and floods) and they are supported by man or directly caused by him (unfavourable climatic changes as a result of the long-term influence of the atmosphere, landslips caused by technical interference etc.).

"*Environmental risk*" is another concept - it is a process or phenomenon, directly caused by the unfavourable influences of human activity on the landscape, which result in unfavourable changes in the structure of the landscape. It is e.g. the pollution of the atmosphere and the water, the degradation and acidification of the soil, the destruction of flora and fauna etc. It is possible to define the actual manifestations of these risks as *threats to the landscape*.

4. Sustainability

Since the publishing of the report "Our common future" (Brundtland et al., 1987), dozens of definitions dealing with an understanding of sustainability have been formulated. Some of them were mentioned in previous chapters.

Huba, Ira (1994) define sustainability as a conception of landscape use which would allow the intensive realisation of human activities only to an extent that would not produce a destructive effect on the landscape system - i.e. the type, method and intensity of the use of landscape productivity (potential) are limited by the conditions of landscape stability (homoeostasis).

We tried to apply the theories of sustainability to the Czech Republic. The method of evaluation consisted of the determination of area preconditions of the landscape from the viewpoint of sustainability. Our aim was not a complex evaluation of all the connections of the complicated system man - landscape but an environmental aspect was stressed.

5. The Evaluation of Area Preconditions for Sustainability in the Czech Republic

The methodology of evaluation which was used consists of four main steps:

- the evaluation of landscape structural stability and resistance of the landscape (the properties of a natural landscape system);
- the evaluation of landscape productivity and potential from the viewpoint of chosen activities (landscape preconditions for a use by man);
- the evaluation of environmental risks and hazards to the landscape (the present environmental state of the landscape);
- the evaluation of area preconditions of landscape from the viewpoint of sustainability (the present state of the landscape with regard to sustainability).

Structural stability and resistance of the landscape

The first step in evaluation was the determination of the essential components and processes of natural landscape that influence landscape structural stability and environmental carrying capacity (resistance).

We have chosen the following set of evaluated parameters:

a) Landscape resistance towards the bedrock and groundwater pollution

- a parameter evaluating the potential resistance of the landscape from the viewpoint of the possible contamination of underground water. We expressed it on the basis of the character of soils and the geological substratum (the permeability of the soil and the substratum) in five relative grades (legends can be found on the maps).

b) Landscape resistance towards landslides and slope failures

- a parameter evaluating the potential resistance of the landscape from the viewpoint of the slope processes. It is described as a combination of the properties of the geological substratum (bedrock resistance) and relief (vertical dissection and slope gradient) in five relative grades.

c) Landscape resistance towards water erosion processes

- a parameter evaluating the potential resistance of the landscape from the viewpoint of water erosion. It is expressed on the basis of a susceptibility of soils and the substratum towards water erosion and on the basis of the characteristics of relief (slope gradient and vertical dissection) in four relative grades.

d) Landscape resistance towards soils acidification

- a parameter evaluating the potential resistance of the landscape from viewpoint of the chemical degradation of soils (the anthropogenically conditioned acidification of soils). It is expressed on the basis of the buffering capacity of soils in Lehotský's sense (1989) in five relative grades.

e) Landscape total resistance (structural stability)

- a comprehensive parameter evaluating the total level of landscape resistance (stability) towards evaluated unfavourable processes.

Landscape productivity and potential

We evaluated landscape suitability (productivity) from the viewpoint of chosen types of anthropogenic activity by a form of expression of relative partial landscape potentials. On the basis of agricultural, silvicultural, water supply and urbanisation potentials, we expressed total landscape productivity from the viewpoint of possible anthropogenic exploitation.

a) Agricultural potential

- a parameter evaluating the suitability of landscape natural properties from the viewpoint of agriculture, above all crop production. We expressed it on the basis of a combination of the properties of the geological substratum, soils, relief and climatic conditions in five relative grades.

b) Silvicultural potential

- a parameter evaluating the suitability of landscape natural properties from the viewpoint of forestry (the production of wood material). We expressed it on the basis of a combination of the properties of the geological substratum, soils, relief and climatic conditions in four relative grades.

c) Water supply potential

- a parameter evaluating landscape productivity from the viewpoint of the supply of drinkable and household water. We expressed it on the basis of the water management importance of individual river basins, the supplies of underground water in five relative grades (taken from the "Atlas of the Environment and Health of the Population of the Czechoslovak Federal Republic" 1992, the author of the map V. Vlcek).

d) Urbanisation potential

- a parameter evaluating the preconditions of an area for the structure of houses, plants and communications. We expressed it on the basis of a combination of the properties of the geological substratum, soils, relief and climatic conditions in four relative grades.

e) Total landscape productivity (classification from the viewpoint of landscape potential)

- the classification of areas on the basis of the integration of individual potentials - it represents a theoretical parameter, in reality it is not possible to use every type of landscape potential in a certain area.

Environmental state of the landscape - evaluation of environmental hazards and risks

We expressed the present environmental state of the landscape both on the basis of the coefficients of the ecological quality of the landscape (the level of originality of landscape structure, the standard of the environment and ecologically important components in an area), and on the basis of the level of the threat to the landscape by man (the intensity of the exploitation of the landscape, the threat to natural resources).

a) Ecologically significant areas

- the classification of ecologically significant parts of the landscape with legislative nature protection.

b) Threatening of the legislatively protected areas

- the determination of the level of threat to large protected landscape areas (national parks and protected landscape areas) and protected zones of natural medical resources and water resources by the negative influences of anthropogenic activity.

c) Threatening of the landscape natural resources - environmental hazards

- a set of parameters expressing the present state of the main natural resources (the substratum, relief and soil, water, atmosphere, genetic pool) from the viewpoint of the actual and potential danger from anthropogenic activity.

d) Total evaluation of environmental hazards

- a classification of areas on the basis of the occurrence of ecological problems (the threat to natural resources), with emphasising of following parameters:

- bedrock and relief deterioration due to extraction of mineral resources
- relief and soil threatening due to soil erosion processes
- relief and soil threatening due to slope failures
- soil threatening due to acidification processes
- environmental deterioration due to excessive air pollution
- forest deterioration due to acid deposition
- surface and groundwater threatening due to excessive pollution
- biodiversity and ecological stability impoverishment due to inadequate land use

Area preconditions of landscape from the viewpoint of sustainability

The present state of the landscape from the viewpoint of the present threat and resistance

- a combination of the parameters of the general threat to the landscape by the negative influence of anthropogenic activity and general landscape resistance (structural stability).

Legend:

1. areas with low threatening by anthropogenic activity, with average stability or better
2. areas with low threatening by anthropogenic activity, with lower stability
3. areas with medium threatening by anthropogenic activity, with average stability or better
4. areas with medium threatening by anthropogenic activity, with lower stability
5. areas with low or medium threatening by anthropogenic activity, unstable
6. areas with high or very high threatening by anthropogenic activity, with average stability or better
7. areas with high or very high threatening, with lower stability
8. areas with high or very high threatening, unstable

Landscape potential for sustainability

- a classification of territory from the viewpoint of the preconditions of sustainable exploitation in a relative six-grade scale.

37

Legend:

1. high - little threatened, stable areas
2. relatively high - little threatened areas, with lower stability
3. medium - quite threatened areas, stable or less than stable
4. relatively low - little or quite threatened, unstable areas
5. low - threatened or very threatened, stable areas
6. very low - threatened or very threatened, less stable or unstable areas

Total landscape preconditions of development from the viewpoint of productivity and sustainability

- a final synthesis of the previous evaluations of landscape productivity and potential for sustainable use with regard to resistance (structural stability) and present environmental state (threat of the landscape).

Legend:

1. *landscape with high or very high productivity and high potential for sustainable use* - little threatened, stable areas, now without serious environmental problems, with good or very good preconditions for further economic use and a low level of risk
2. *landscape with high or very high productivity and relatively high potential for sustainable use* - little threatened, less stable areas, now without serious environmental problems, with good or very good preconditions for further economic use and a higher level of risk
3. *landscape with high or very high productivity and medium potential for sustainable use* - quite threatened, stable or less stable areas, now with environmental problems, with quite good preconditions for further economic use and a higher level of risk
4. *landscape with high or very high productivity and relatively low potential for sustainable use* - less or quite threatened, unstable areas, now with environmental problems, with quite bad or bad preconditions for further economic use and a higher level of risk
5. *landscape with high or very high productivity and low potential for sustainable use* - threatened or very threatened, stable areas, now with serious environmental problems, with quite bad or bad preconditions for further economic use and a higher level of risk
6. *landscape with high or very high productivity and very low potential for sustainable use* - threatened or very threatened, less stable or unstable areas, now with serious environmental problems, with very bad preconditions for further economic use and a very high level of risk
7. *landscape with medium or relatively low productivity and high potential for sustainable use* - little threatened, stable areas, now without serious environmental problems, with average preconditions for further economic use and a low level of risk
8. *landscape with medium or relatively low productivity and relatively high potential for sustainable use* - little threatened, less stable areas, now without serious environmental problems, with average preconditions for further economic use and a higher level of risk
9. *landscape with medium or relatively low productivity and medium potential for sustainable use* - quite threatened, stable or less stable areas, now with environmental problems, with quite bad preconditions for further economic use and a higher level of risk
10. *landscape with medium or relatively low productivity and relatively low potential for sustainable use* - little threatened or quite threatened, unstable areas, now with environmental problems, with bad preconditions for further economic use and a very high level of risk
11. *landscape with medium or relatively low productivity and low or very low potential for sustainable use* - threatened or very threatened, stable areas, now with serious environmental problems, with bad preconditions for further economic use and a higher level of risk.

12. *landscape with low or very low productivity and high or relatively high potential for sustainable use* - little threatened, less stable areas, now without serious environmental problems, with bad preconditions for further economic use and a higher level of risk.
13. *landscape with low or very low productivity and medium potential for sustainable use* - quite threatened, stable or less stable areas, now with environmental problems, with very bad preconditions for further economic use and a higher level of risk.
14. *landscape with low or very low productivity and relatively low potential for sustainable use* - little or quite threatened, unstable areas, now with environmental problems, with very bad preconditions for further economic use and a very high level of risk.
15. *landscape with low or very low productivity and low or very low potential for sustainable use* - threatened or very threatened, little stable or unstable areas, now with serious environmental problems, with very bad preconditions for further economic use and a very high level of risk.

Landscape as a Resource, Landscape as a Home

In the presented study we have devoted most of our time and attention to the evaluation of the ecological preconditions for the use of the landscape by man and we also consider this part to be the most fully worked out and useful. In the analytical part of the study we have given methodology and individual results - thematic maps, concerning the stability of the landscape, its resources and productivity, environmental risks and the threat to the landscape (see the chapter "Landscape - ecological evaluation of the territory of the Czech Republic"). In this concluding part we present a general, synthetic evaluation of the landscape-ecological preconditions for the sustainable use of areas and the characterisation of seventeen chosen regions of the Czech Republic. We think that the defining of these socio-economic regions could help to bring about a discussion on the arrangement of constitutional law in the Czech Republic.

Characterisation of Regions of the Czech Republic

For the evaluation of the socio-economic and natural conditions of the Czech Republic it was necessary to define suitable regions for which individual analytical and synthetical parameters of the present state of the landscape would be evaluated, and which would form a basis for the elaboration of scenarios of possible development (especially scenarios of sustainable development). The present territorial-administrative division into "counties" (more than 70 counties in the Czech Republic) is too detailed for this purpose, on the contrary seven former provinces represent big and non-homogeneous units from various points of view.

By the specialised division into regions, we attempted to form relatively homogeneous regions which would also be comparable in size. Economic relations - especially commuting - are the main criterion of division. This criterion reflects quite well the natural gravitation of areas to centres of varied importance and also partly takes into account the historical development and natural conditions of each area. As further auxiliary criteria we used:

38

- - the borders of present "counties" and former "provinces"
- - the historical development of the territorial division of Bohemia, Moravia and Silesia.

In total, the following 17 individual socio-economic regions were defined:

- Prague region
- North-Bohemian region
- West-Bohemian region
- Plzen region
- Sumava mountain region
- Příbram-Tábor region
- South-Bohemian region
- Bohemian-Moravian Uplands region
- Elbe-basin region
- Krkonose mountain region
- East-Bohemian region
- Olomouc region
- Silesia region
- Ostrava region
- East-Moravian region
- Brno region
- South-Moravian region.

The borders of the created regions are not always formed by county borders, sometimes, especially when changes were made, it was because of the relationships connected with commuting.

Olomouc Region - Example of Detailed Characterisation of Region

It consists of the counties of Olomouc, Prerov, Prostějov and partly Kromeriz (the western part) and parts of the counties of Šumperk (the central part), Bruntál (south-western and southern part) and Vyskov (northern part).

From the viewpoint of natural conditions the region is located on the border of the Bohemian Uplands and West Carpathian Mountains. The core of the area is the lowlands of the West Carpathians - the Upper-Moravian Basin, the north edge of the Vyskov Basin and the southern part of the Moravian Gate. On the western, northern and eastern periphery of the lowlands there are mostly the submountain silicate hilly areas of the Drahanska Highlands, the Zábřeh Highlands, the Hanusovice Highlands and the Nízký Jeseník Mountains. The south and south-east edges of the region are formed by flysch units of the West Carpathians - the hilly countryside of Litence, the foothills of the Beskydy mountains and the edges

of the Chřibý mountains. The western part of the silicate highlands of Hrubý Jeseník reach the north of the region.

From the economic point of view it is a very important region, with an accumulation of industrial production in its central and southern parts (centres Olomouc, Prerov, Prostějov and Kromeriz, smaller towns Unicev, Sternberk, Litovel and Hranice), with relatively little developed production in its northern part (Šumperk is the only bigger centre). From the viewpoint of agricultural production the region is one of the most important in the Czech Republic - in its central and southern parts the lowland beet-growing type of agriculture is dominant, in its western part there is the grain and potato-growing type. The north and east of the region are characterised by less intensive mountain pasture and a submountain grain and pasture type of agriculture and an important function of forestry.

From the viewpoint of the total structural stability (resistance) of the landscape (SSL), it is possible to characterise the region as heterogeneous - the lowland central and southern parts have mostly high SSL, the submountain and mountain part on the periphery has quite low SSL, while the flysch areas in the south and south-east have quite a low or low, sometimes very low, SSL.

From the viewpoint of the total productivity of the landscape (TLP) the region (especially its lowland part) is one of the most productive areas of the Czech Republic with high or very high TLP. In the area of the Hrubý Jeseník Mountains, in higher locations of the Nízký Jeseník mountains and Hanusovice highlands, there is a low or very low TLP, while in lower locations of the Nízký Jeseník Mountains and the Zábřeh highlands there is average or quite low TLP.

From the viewpoint of the total threat to the landscape (TTL) the region is average for the Czech Republic. The mountainous part of the region (with the exception of the degradation of forests by emissions in the area of Kralický Sněžník and the Hrubý Jeseník mountains) has relatively few problems; it is possible to consider the lowland areas as quite threatened, with a low level of ecological stability of the landscape and a local threat to the relief and soils by erosion. Industrial centres and their surroundings (Olomouc, Prerov, Prostějov and Hranice) are threatened areas with an accumulation of a low level of ecological stability of the landscape, atmospheric pollution and the chemical degradation of the soil. The threat to relief by landslides increases in flysch hilly country and highlands.

The landscape potential for sustainable use (LPS) are average in the lowland areas of the region and low around bigger centres. Submountain and mountain areas of the Czech Highlands have usually quite good LPS, sometimes very good. On the contrary, the flysch hills and highlands of the West Carpathians have mostly quite low or very low LPS with regard to their low structural stability. The general development preconditions of the landscape from the viewpoint of productivity and sustainability are only average in the region in comparison with the Czech Republic as a whole, with the exception of highland areas of the northern part of the region with low or very low productivity and quite good or very good preconditions of sustainability. In flysch areas these preconditions are low.

When dividing the Czech Republic into regions there was a basic question: do we consider the landscape only as a potential source of top-quality raw materials that have to be used till it is possible to sell them, or do we consider the landscape to be a certain resource (a landscape space, with recreational, aesthetic etc. functions),

or do we want to perceive the landscape also as our home with emotional connections and impulses which are difficult to define? The first attitude is noticeable in present government policy. The Central-Bohemian Karst for example is understood especially as a store of raw material - high-quality lime.

We have tried to adopt the second attitude in this study - we understand the Czech landscape as a valuable and unique resource, whose potential (in agriculture, urbanisation, water management, forestry, recreation etc.) should be used, protected and improved through a sustainable economy.

The third attitude can be expressed probably only by artists, above all by landscape artists. It is interesting and inspiring to compare a Czech landscape from past decades and centuries, as depicted by painters, with the present reality. The words of the director Cisarovský, that the state of our landscape reflects the state of our heart, our soul, are true.

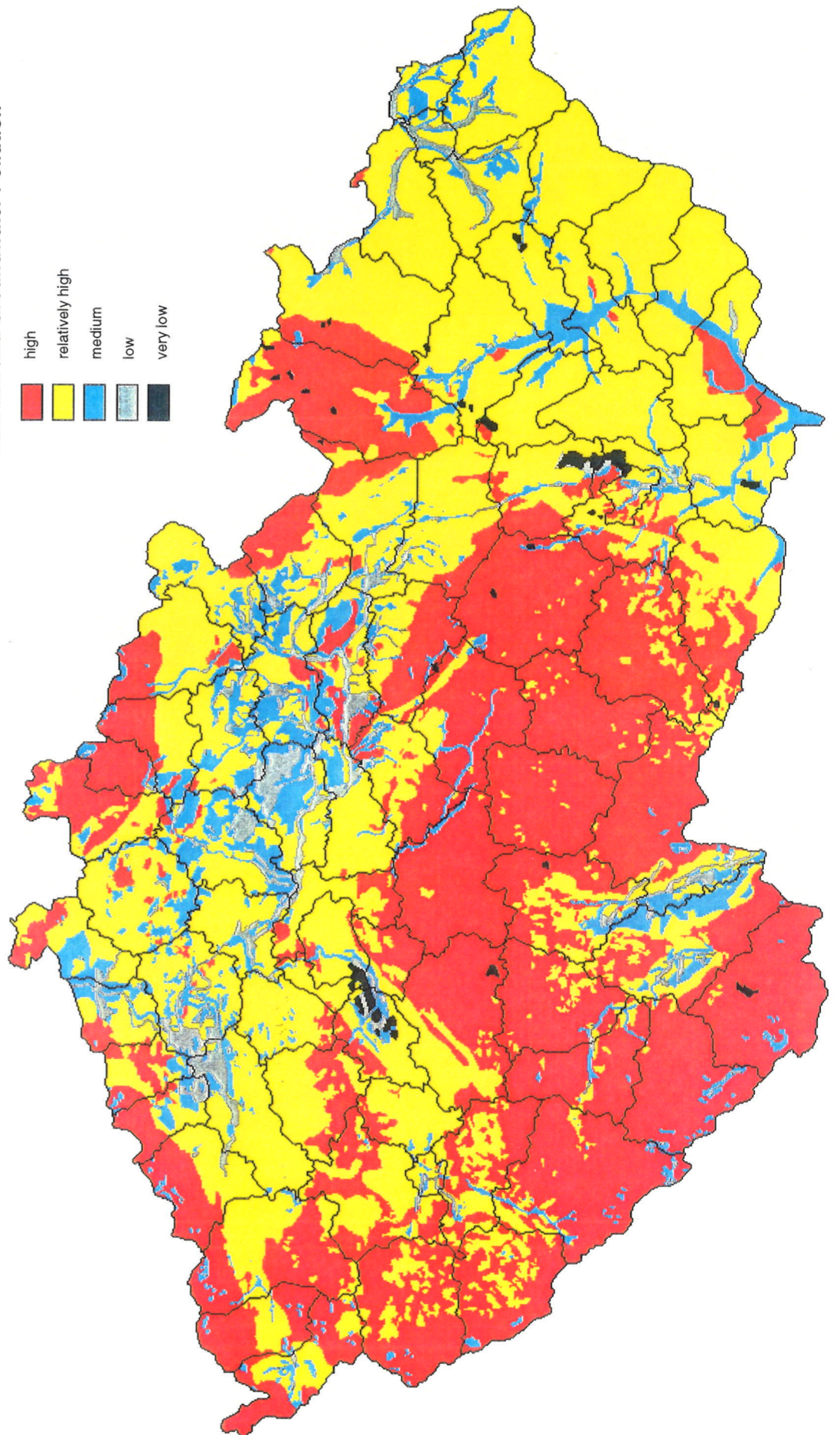
We proposed dividing the republic into seventeen regions. (This division should be understood as a contribution to the discussion about territorial-administrative division, as an inspiration and not as a suggestion that we will try to push through. For pragmatic and administrative-organisational reasons the division of the republic into eight regions might seem to be more practical: the central-bohemian, western-bohemian, north-bohemian, south-bohemian, east-bohemian, south-moravian, central-moravian and north-moravian regions: or into nine regions if Prague with its surroundings is taken as an independent region.). Municipalities should be a lower element. In an area about the size of the present counties, or smaller, local state administration offices should be opened, that would make it possible for the citizens to discharge official business in a simpler and more accessible way (e.g. in the present vast district of Zdar over Sázava two or three areas could be formed with local authorities, which however would be included in the Bohemian-Moravian Highlands region).

Three "lands" could be a higher level of constitutional-law organisation: the Czech land, the Moravian-Silesian land and the Prague region, which would have the status of a land. These lands could have the form of a federal organisation with a considerable level of independence and autonomy of municipalities and regions. Or the state itself in a unified form could be above these regions.

With the expected entry of the Czech Republic into the European Union, part of its powers will be shifted from the national level to the supranational level (the privileged position of Prague in the Czech lands will be in this way counterbalanced by the greater powers of municipalities and regions, but also by the orientation and shift of some powers to Brussels), in the long-term perspective also to a global level (states could devolve a part of their powers to the UNO, that would then be able to take over some powers of the present sovereign states, concerning e.g. the environment).

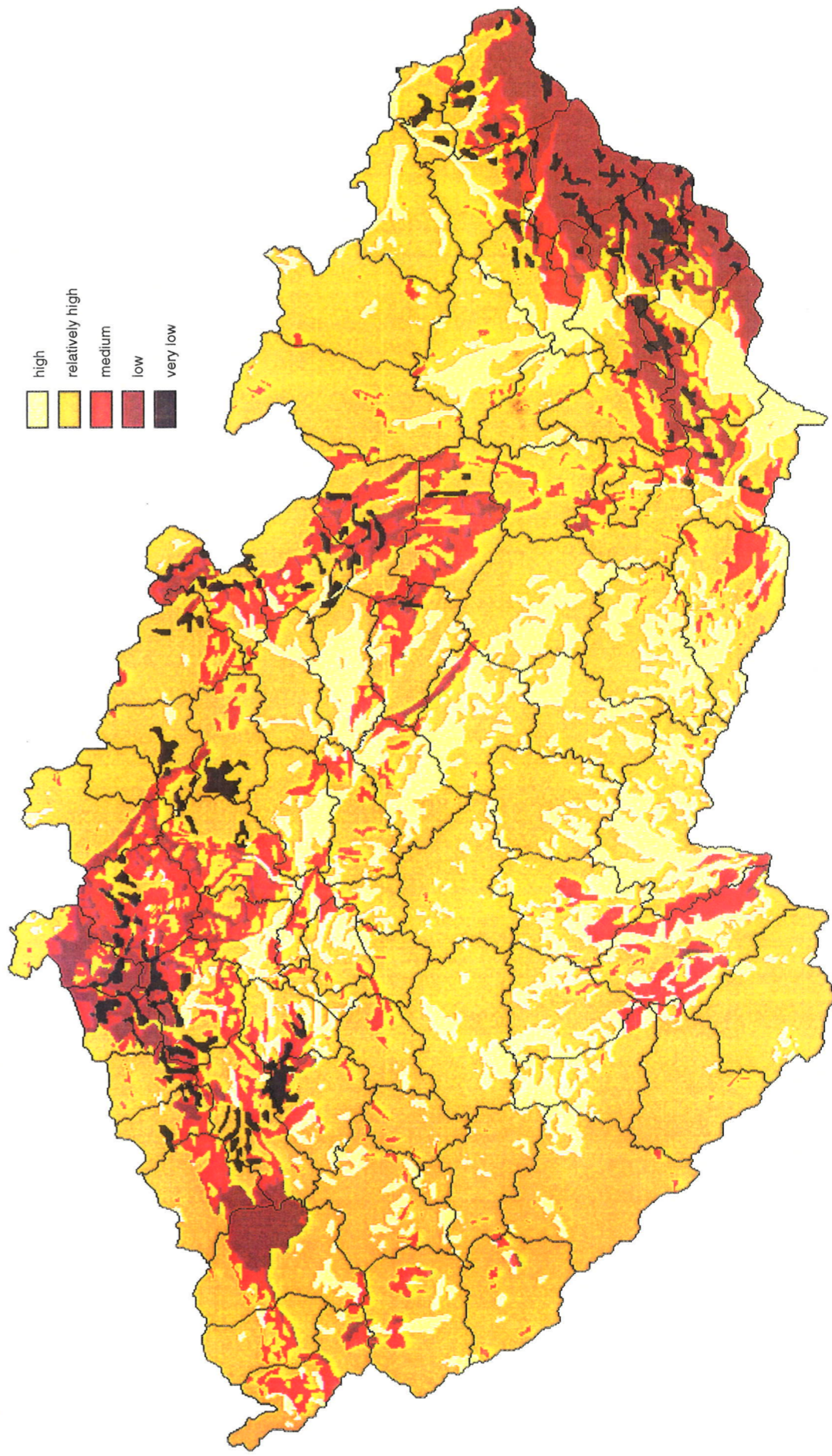
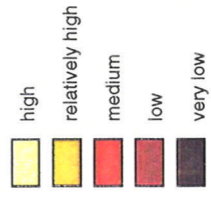
CZECH REPUBLIC LANDSCAPE RESISTANCE

Landscape Resistance towards the
Bedrock and Groundwater Pollution



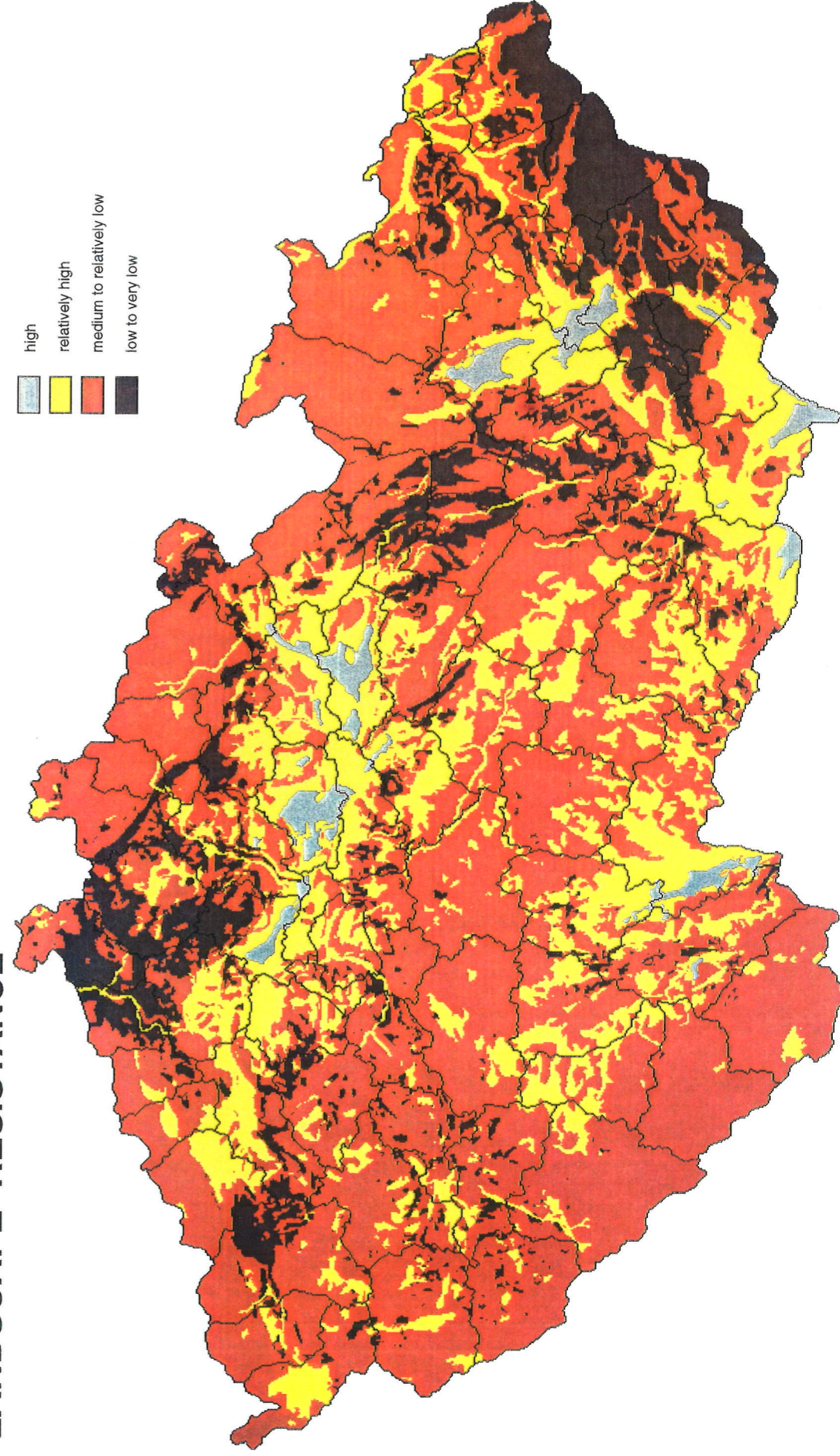
CZECH REPUBLIC LANDSCAPE RESISTANCE

Landscape Resistance towards
Landslides and Slope Failures



CZECH REPUBLIC LANDSCAPE RESISTANCE

Landscape Resistance towards
Water Erosion Processes



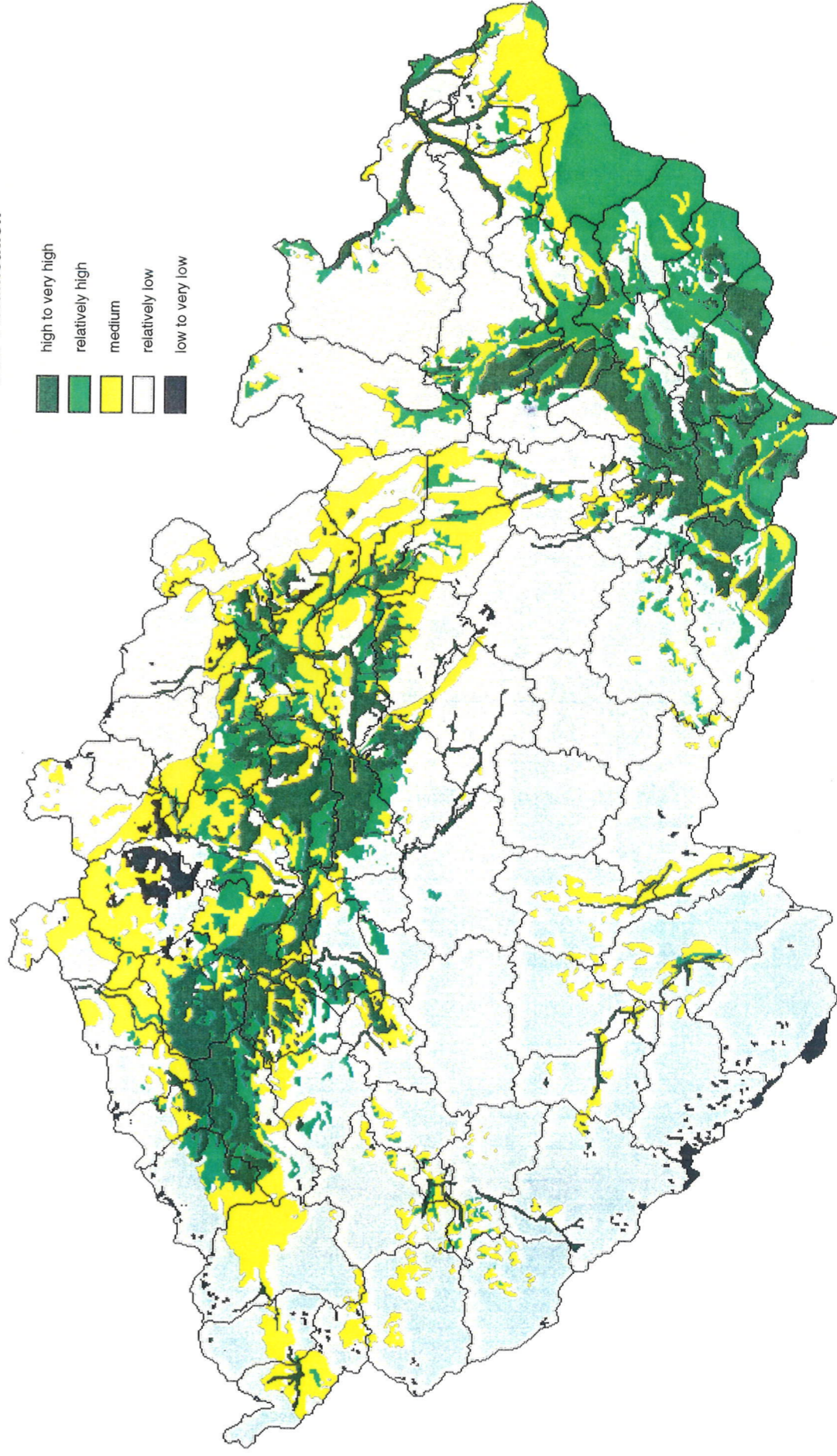
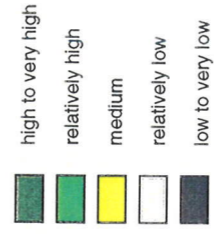
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Map No.3

CZECH REPUBLIC

LANDSCAPE RESISTANCE

Landscape Resistance towards
Soil Acidification

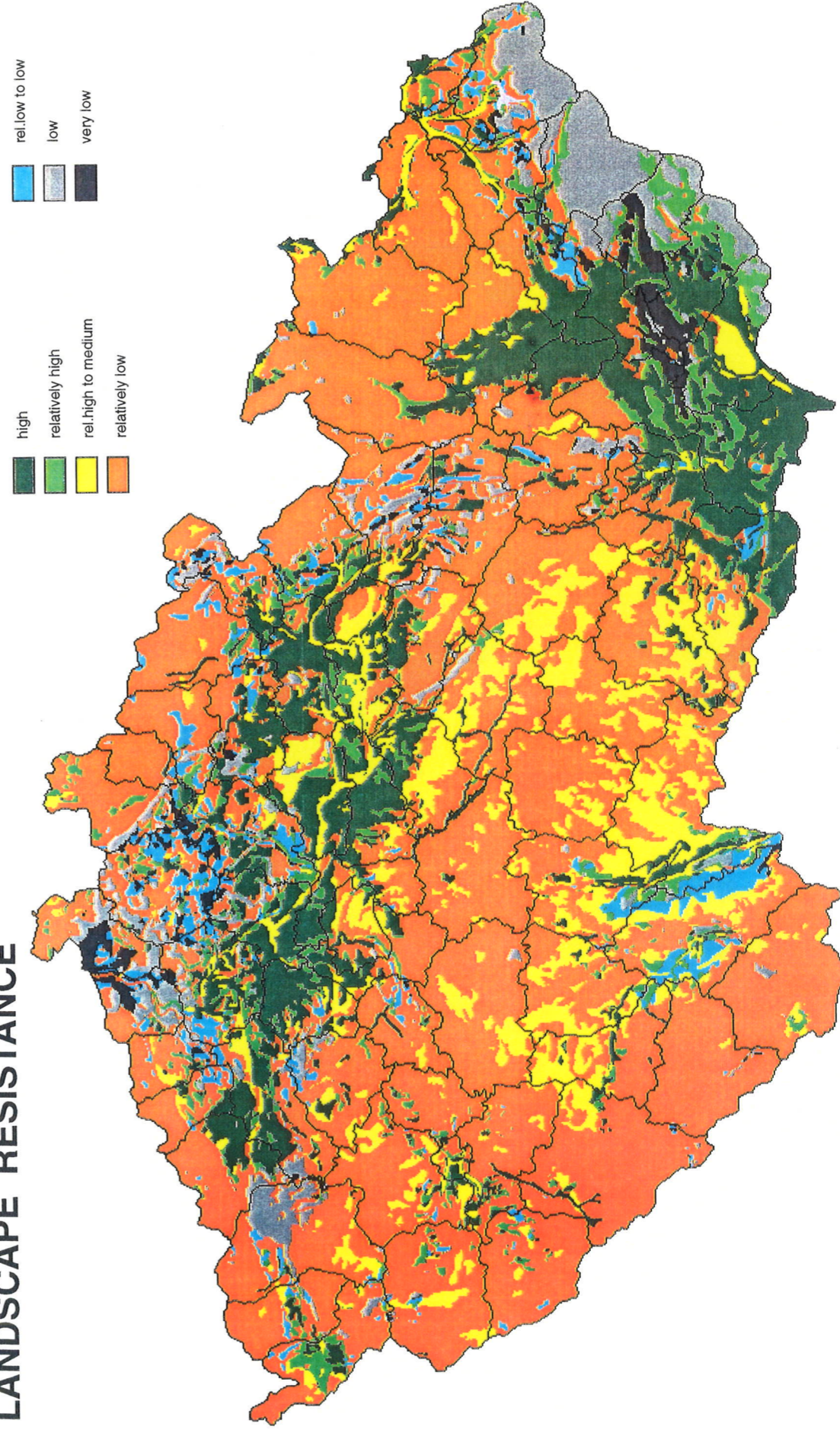


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Map No.4

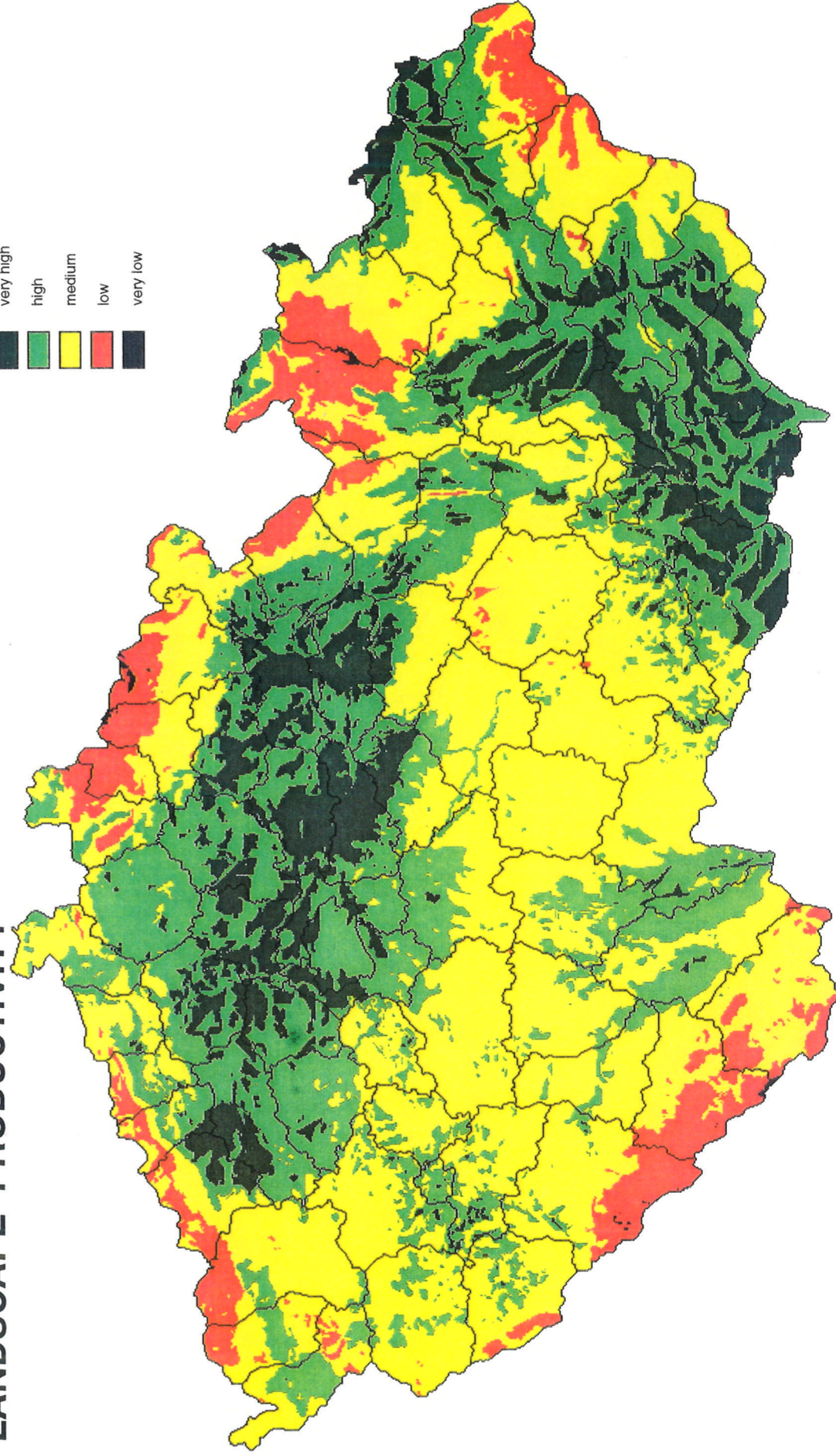
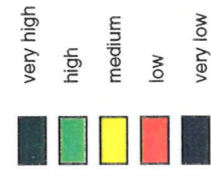
CZECH REPUBLIC LANDSCAPE RESISTANCE

Overall Landscape Resistance (Structural Stability)



CZECH REPUBLIC LANDSCAPE PRODUCTIVITY

Agricultural Potential

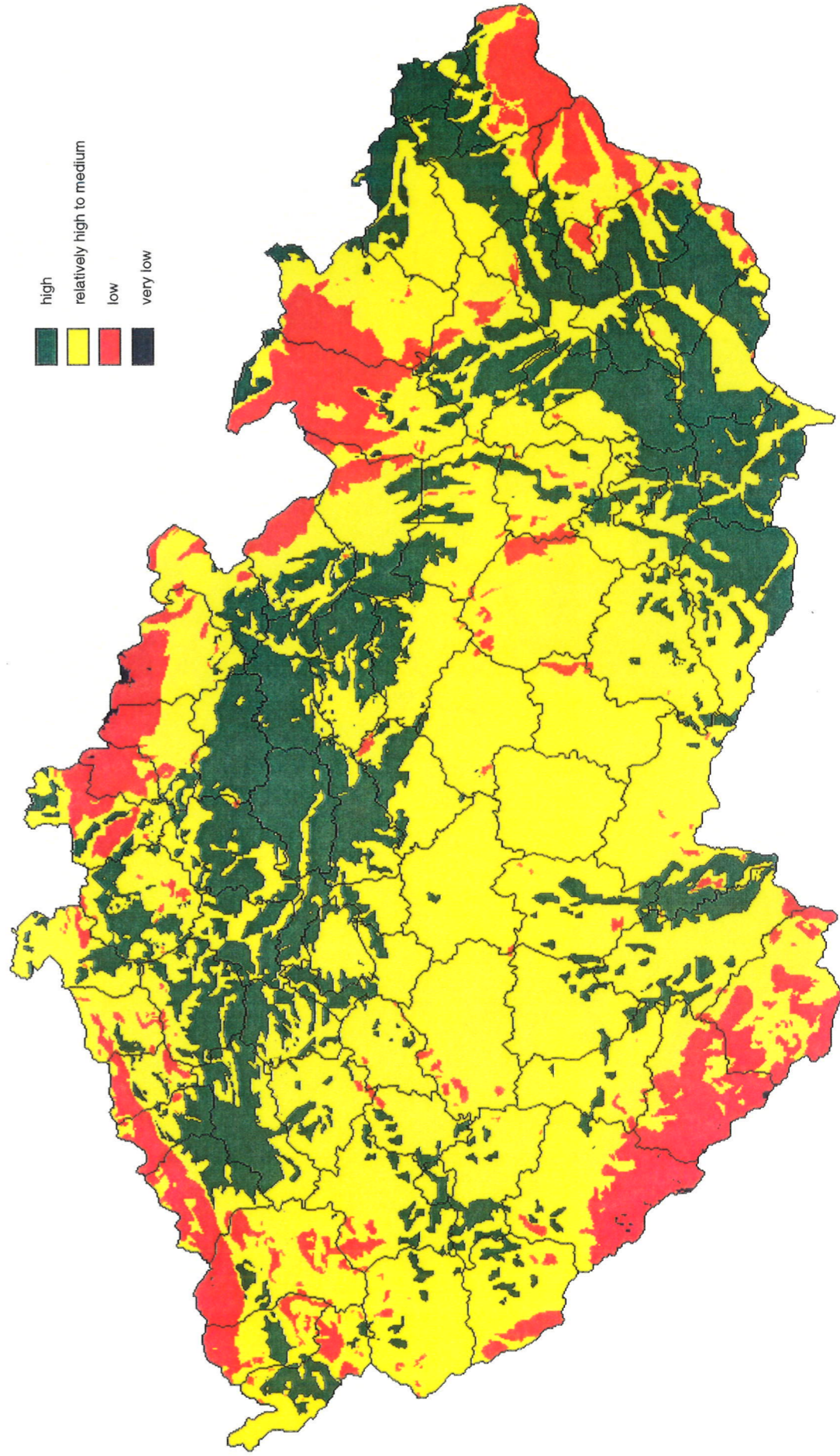
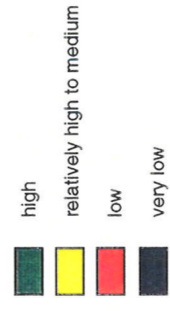


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Map No.6

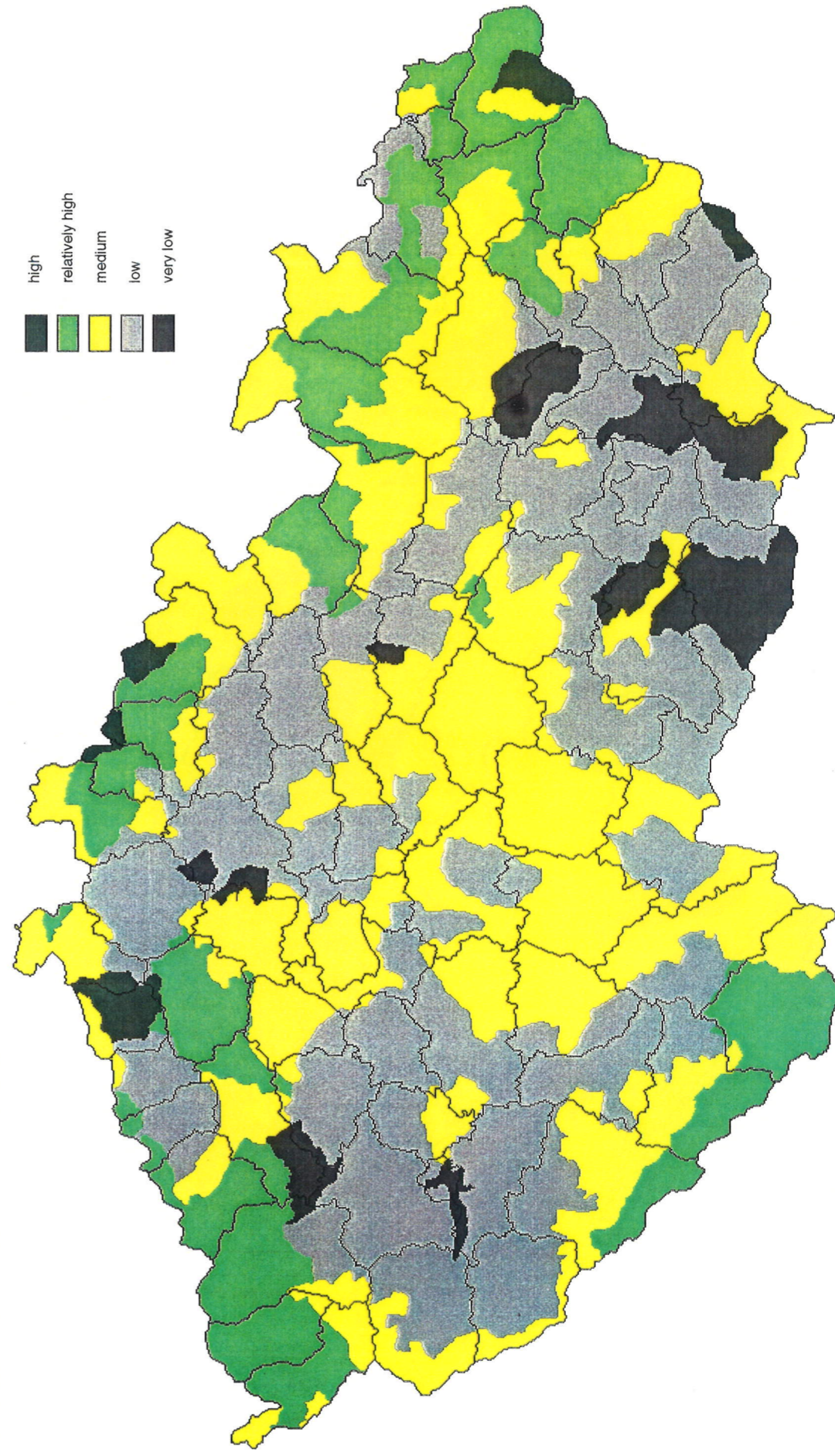
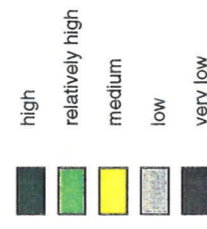
CZECH REPUBLIC LANDSCAPE PRODUCTIVITY

Silvicultural potential



CZECH REPUBLIC LANDSCAPE PRODUCTIVITY

Water-Supply Potential
(Vicek 1992)

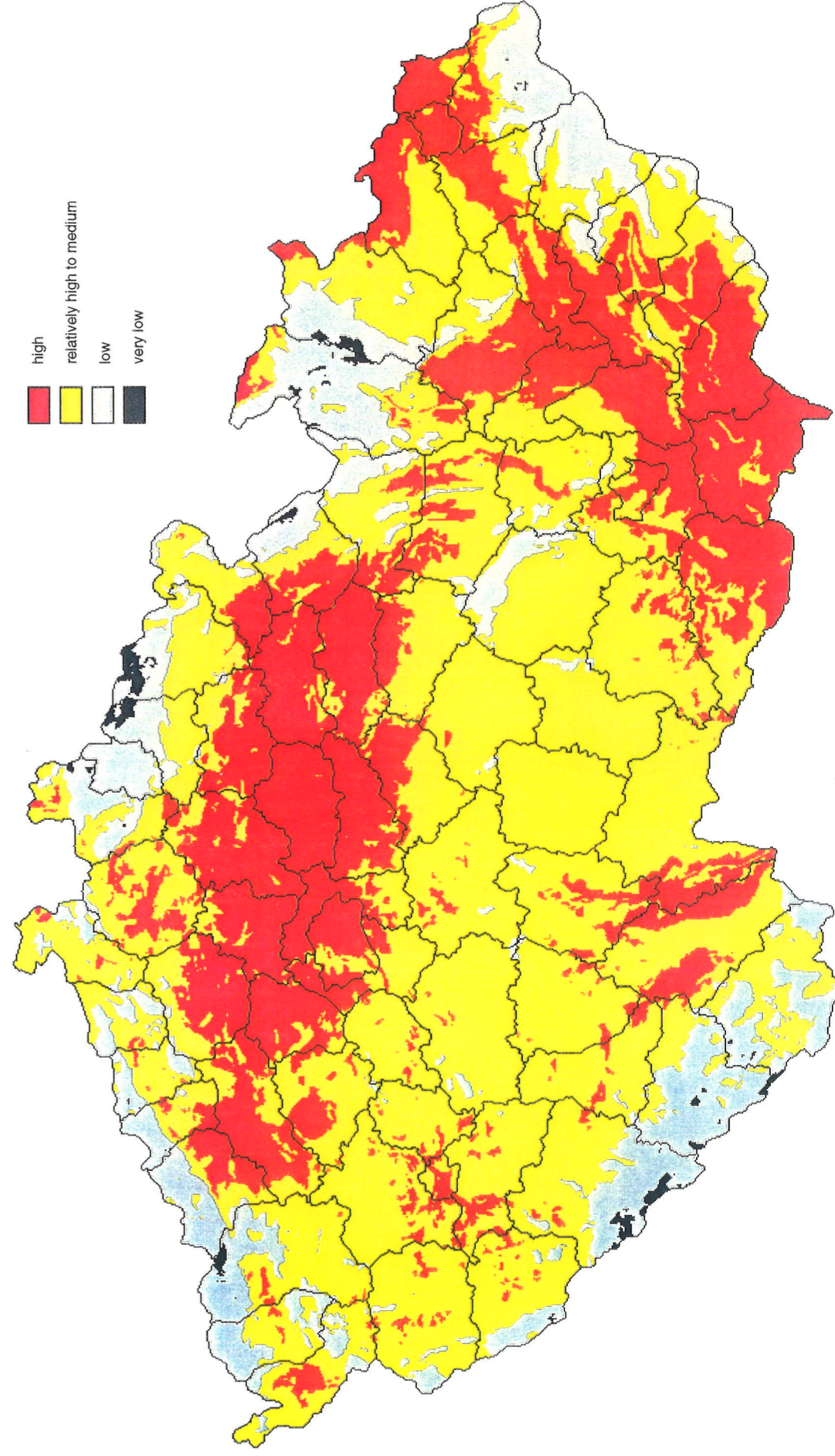
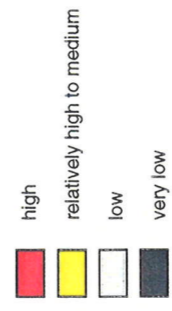


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Map No.8

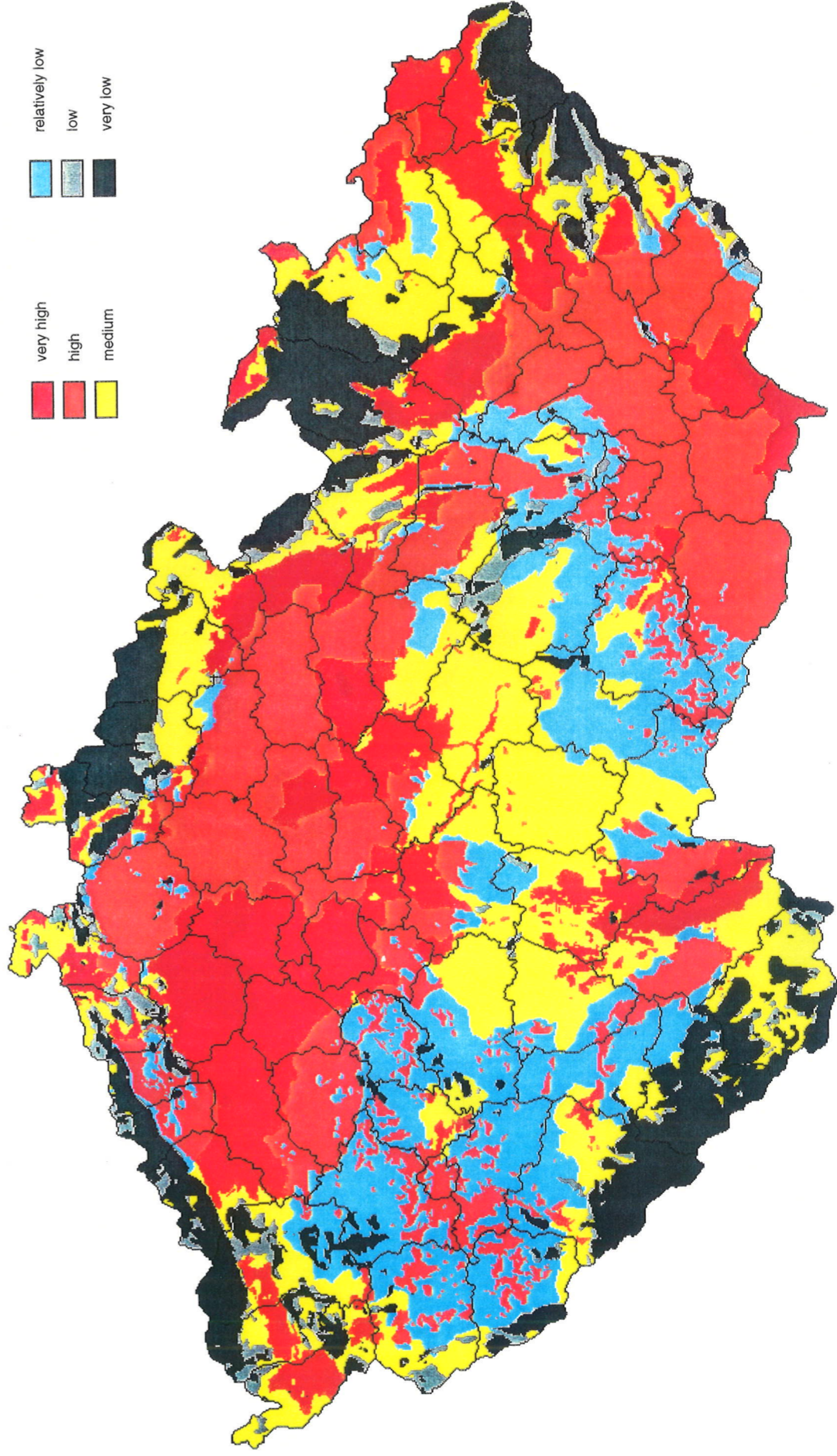
CZECH REPUBLIC LANDSCAPE PRODUCTIVITY

Urbanization Potential



CZECH REPUBLIC LANDSCAPE PRODUCTIVITY

Overall Landscape Productivity

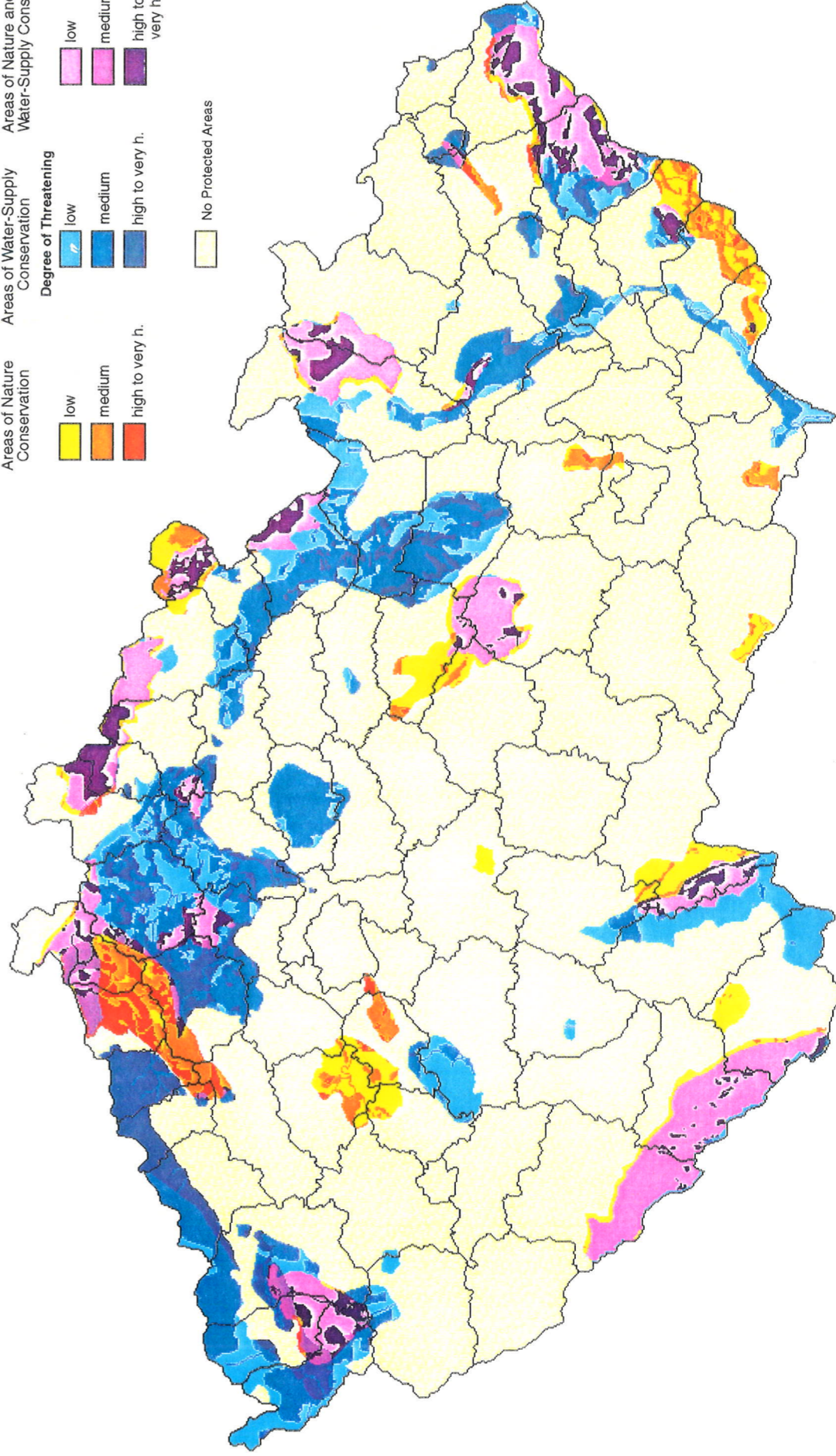
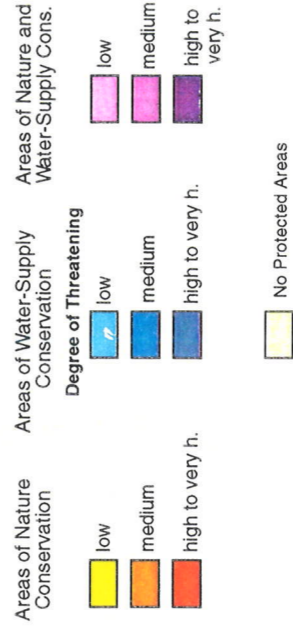


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Map No.10

CZECH REPUBLIC LANDSCAPE THREATENING

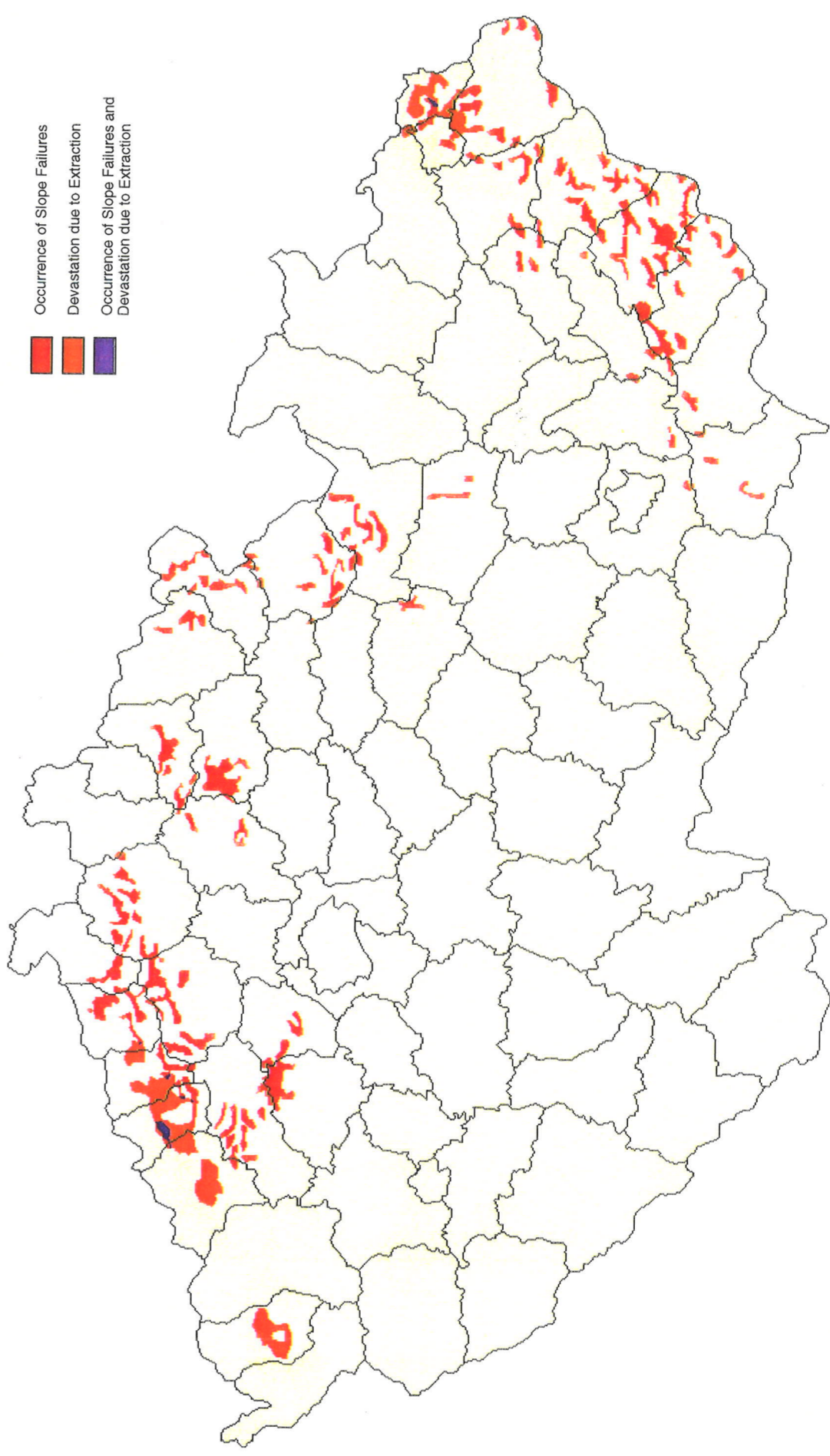
Threatening of Legislatively Protected Areas



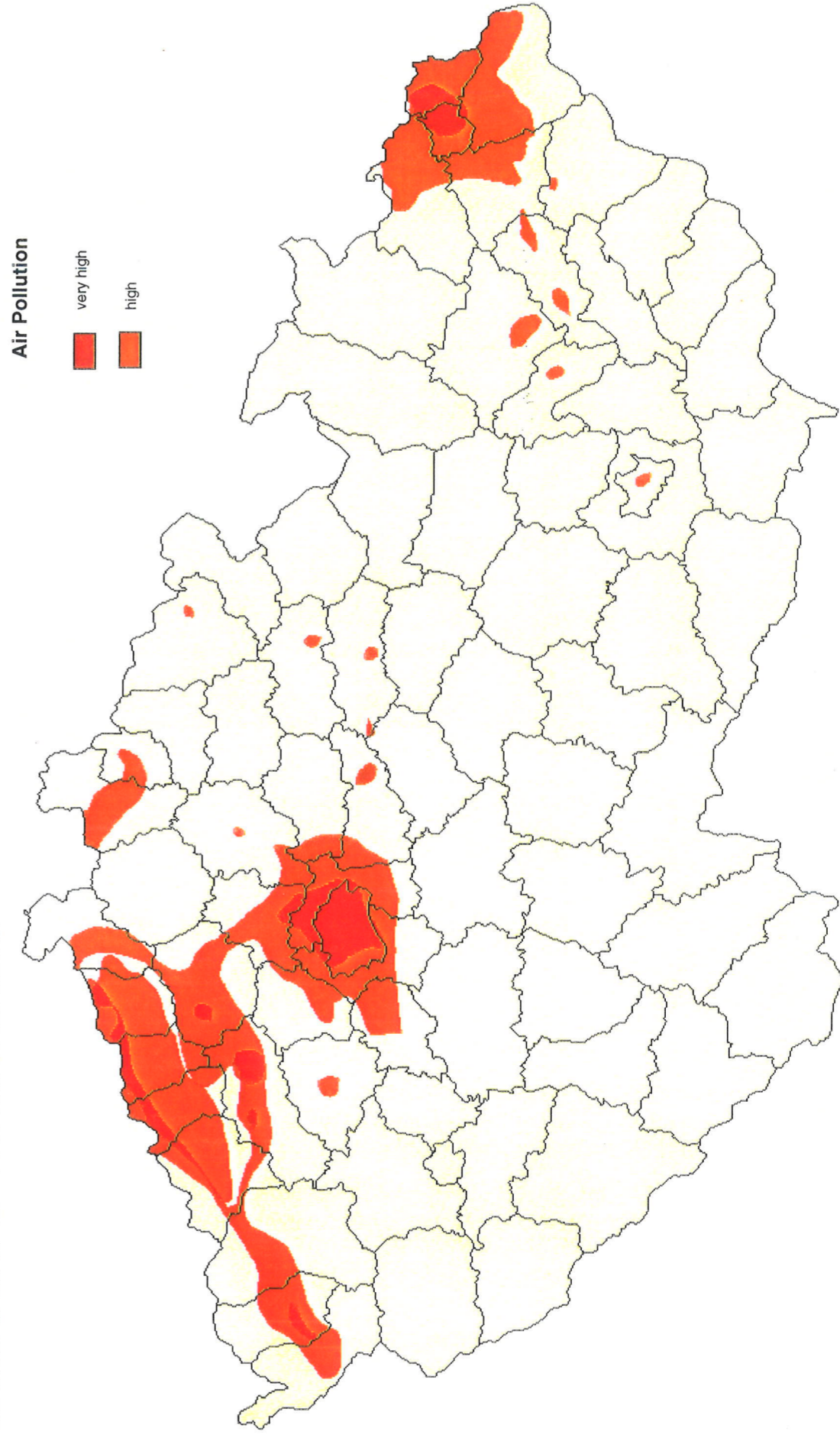
CZECH REPUBLIC LANDSCAPE THREATENING

Bedrock and Relief Deterioration

- Occurrence of Slope Failures
- Devastation due to Extraction
- Occurrence of Slope Failures and Devastation due to Extraction



CZECH REPUBLIC LANDSCAPE THREATENING

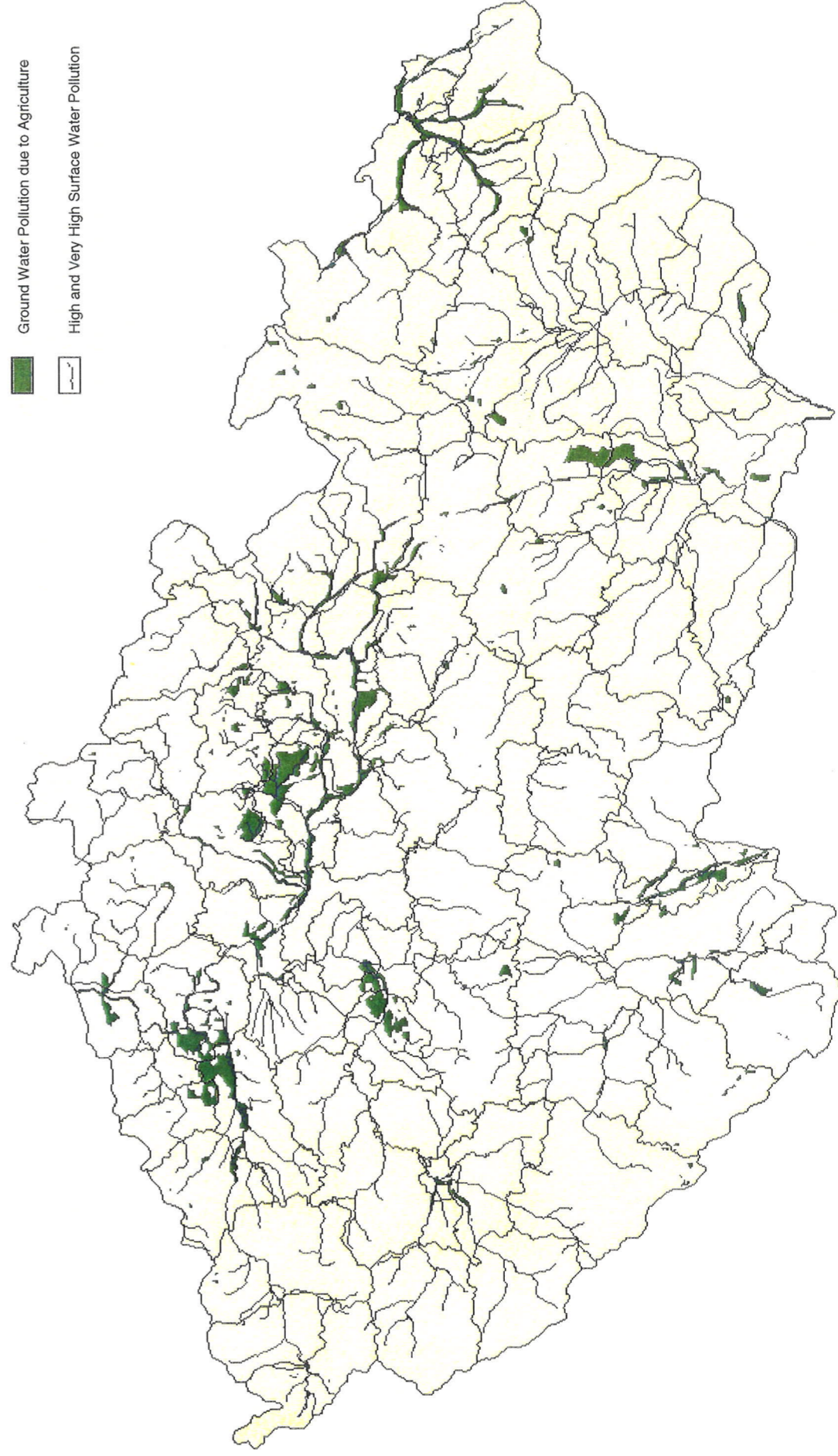


CZECH REPUBLIC LANDSCAPE THREATENING

Surface and Ground Water Deterioration

Ground Water Pollution due to Agriculture

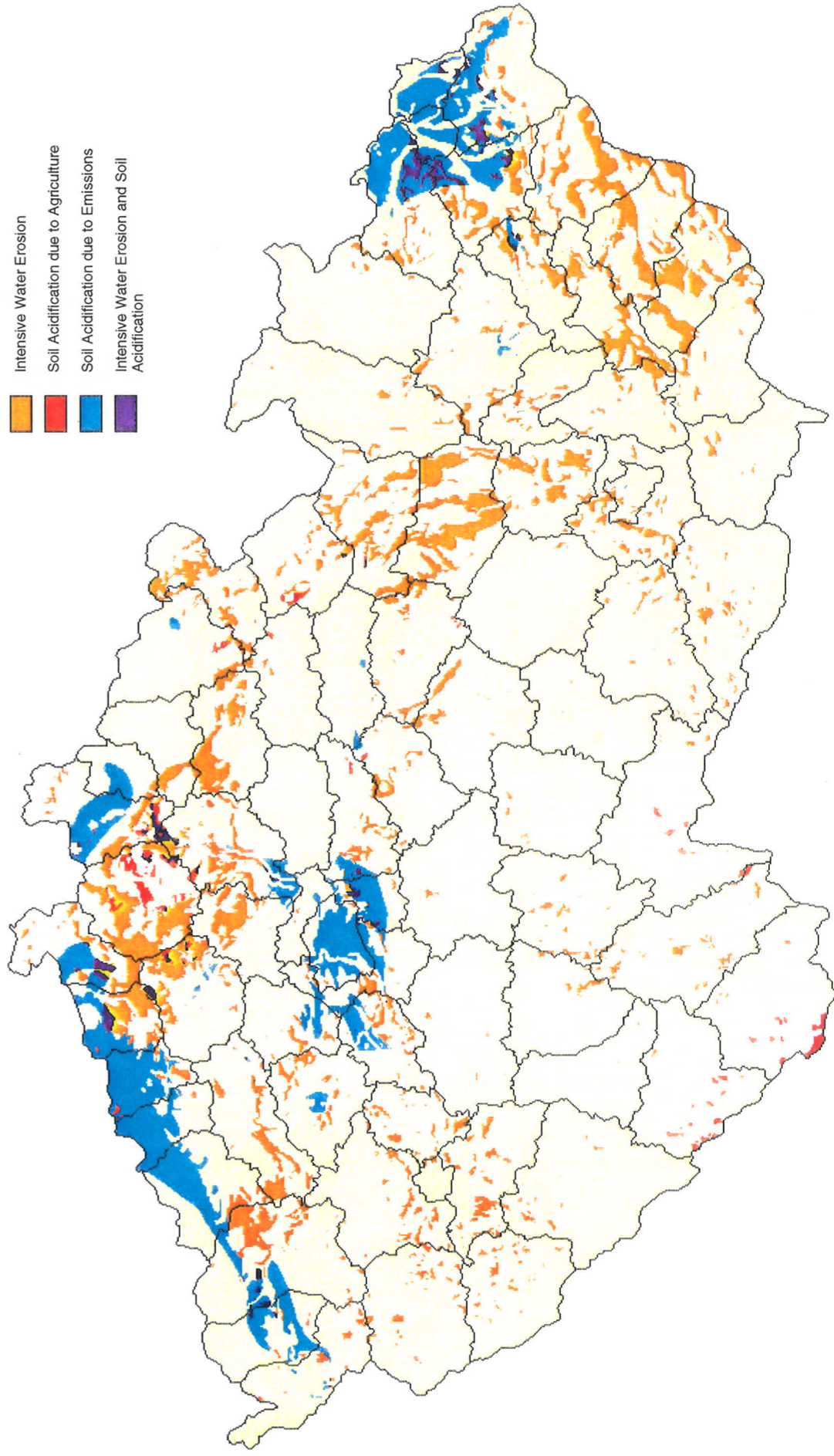
High and Very High Surface Water Pollution



CZECH REPUBLIC LANDSCAPE THREATENING

Soil Deterioration

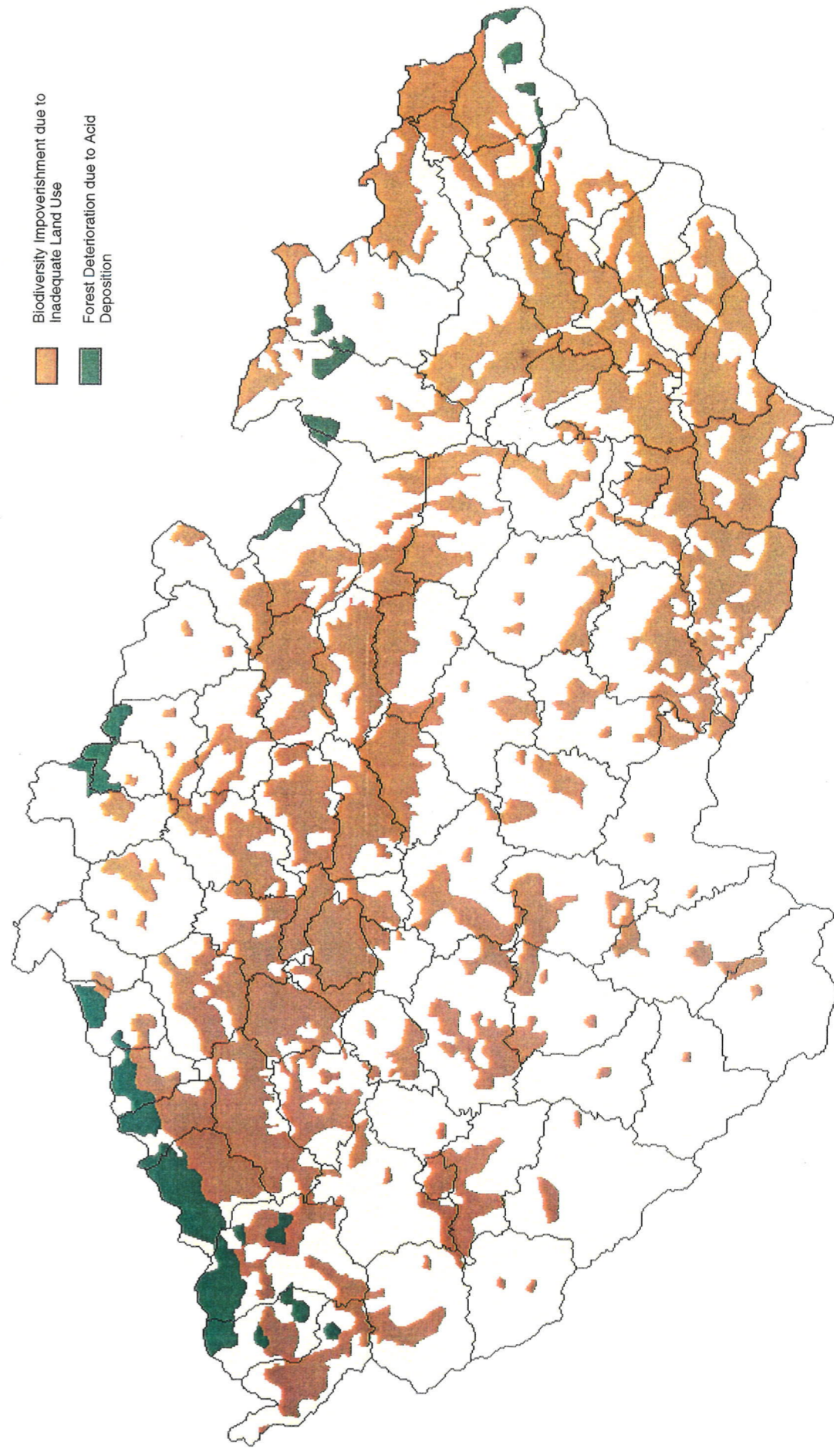
- Intensive Water Erosion
- Soil Acidification due to Agriculture
- Soil Acidification due to Emissions
- Intensive Water Erosion and Soil Acidification



CZECH REPUBLIC LANDSCAPE THREATENING

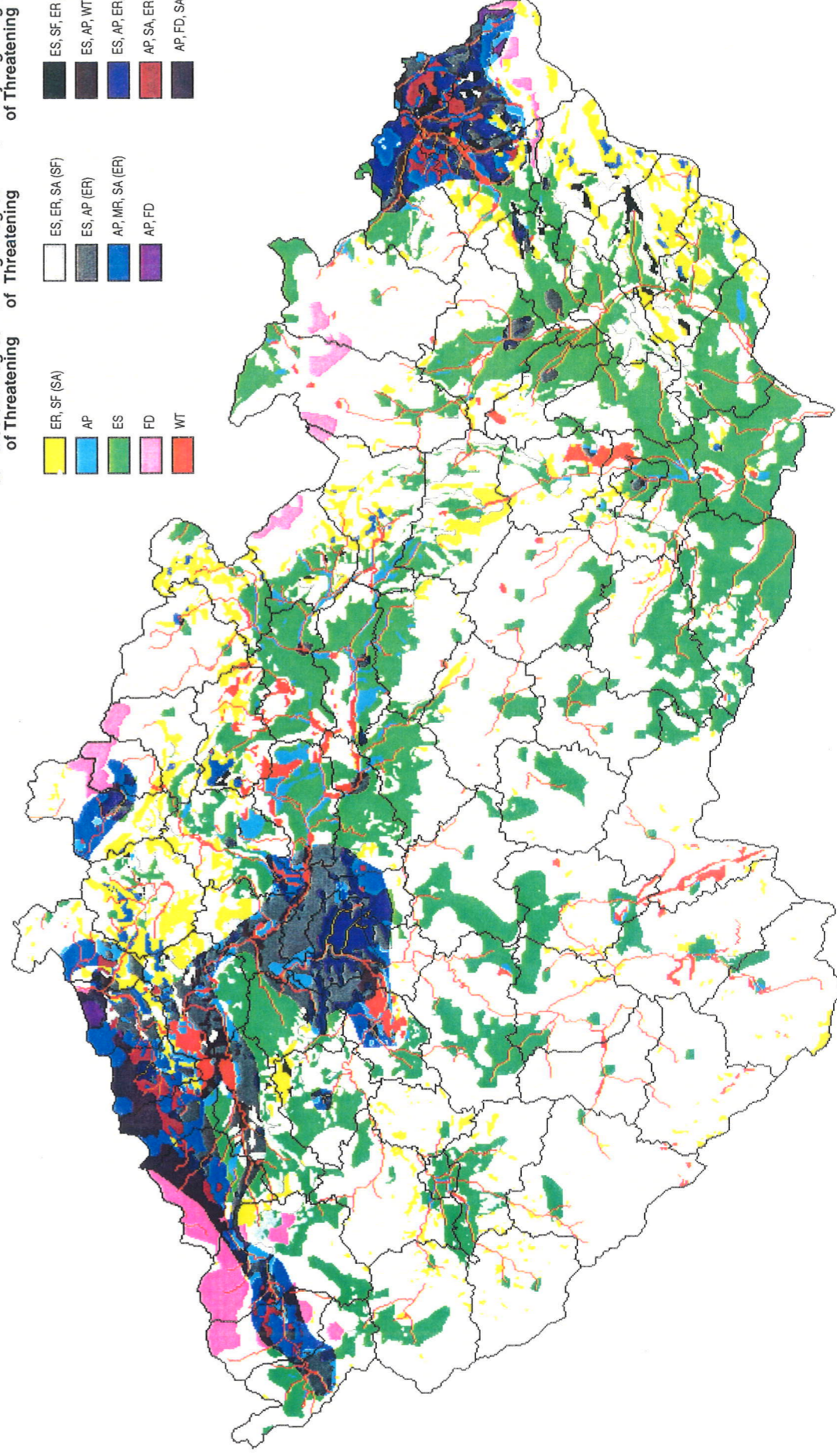
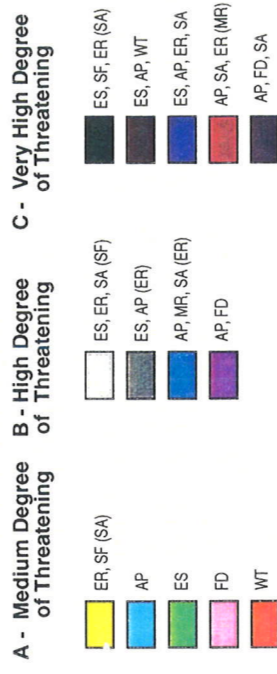
Threatening of Genetic Pool

- Biodiversity Impoverishment due to Inadequate Land Use
- Forest Deterioration due to Acid Deposition



CZECH REPUBLIC LANDSCAPE THREATENING

Overall Environmental Hazards and Risks



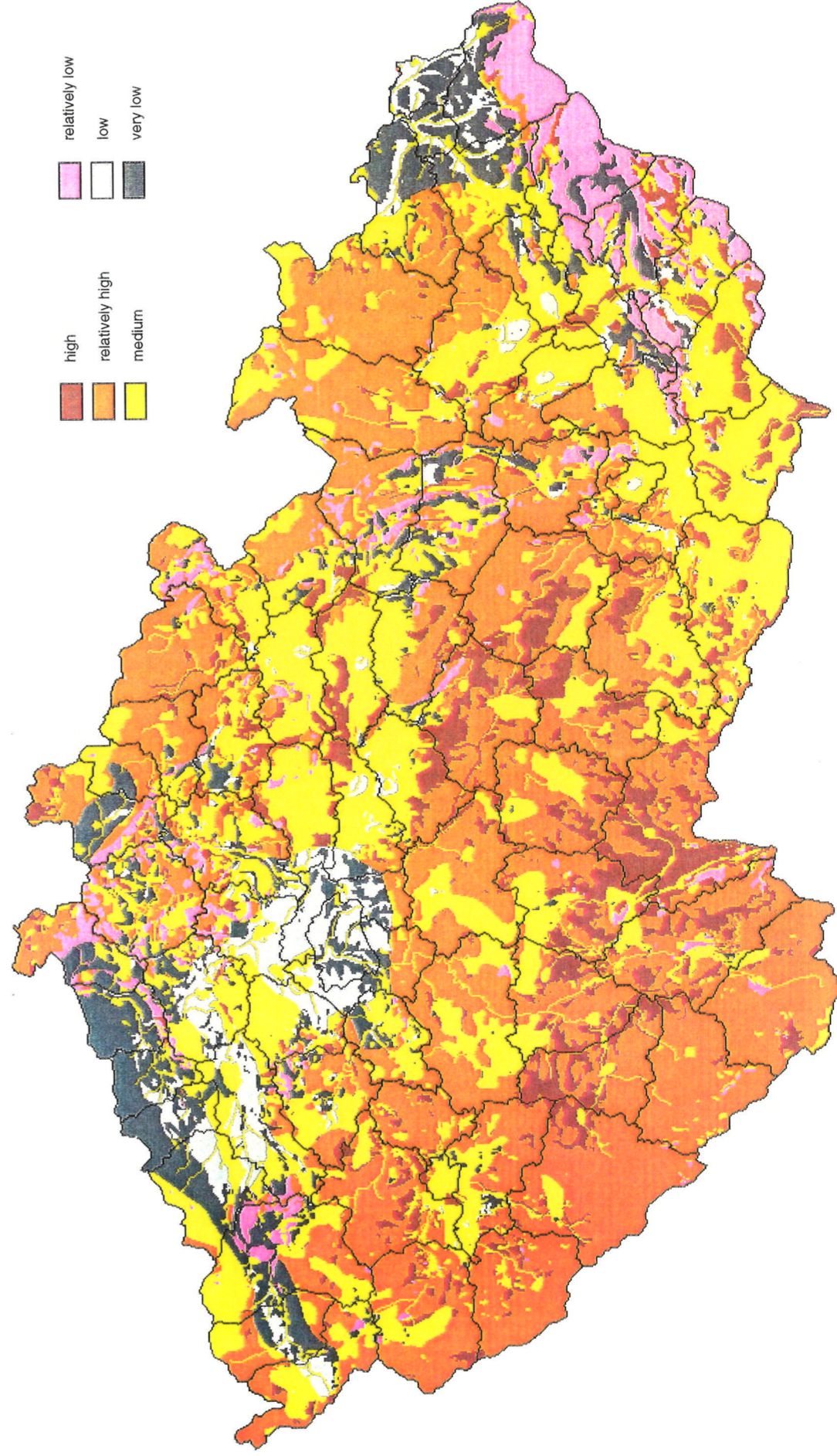
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MR - Bedrock and Relief Deterioration due to Extraction of Mineral Resources, ER - Relief and Soil Threatening due to Soil Erosion Processes, SF - Relief and Soil Deterioration due to Slope Failures, SA - Soil Threatening due to Acidification Processes, AP - Environmental Deterioration due to Excessive Air Pollution, FD - Forest Deterioration due to Acid Deposition, WT - Surface and Ground Water Threatening due to Excessive Pollution, ES - Biodiversity and Ecological Stability Impoverishment due to Inadequate Land Use

Map No.17

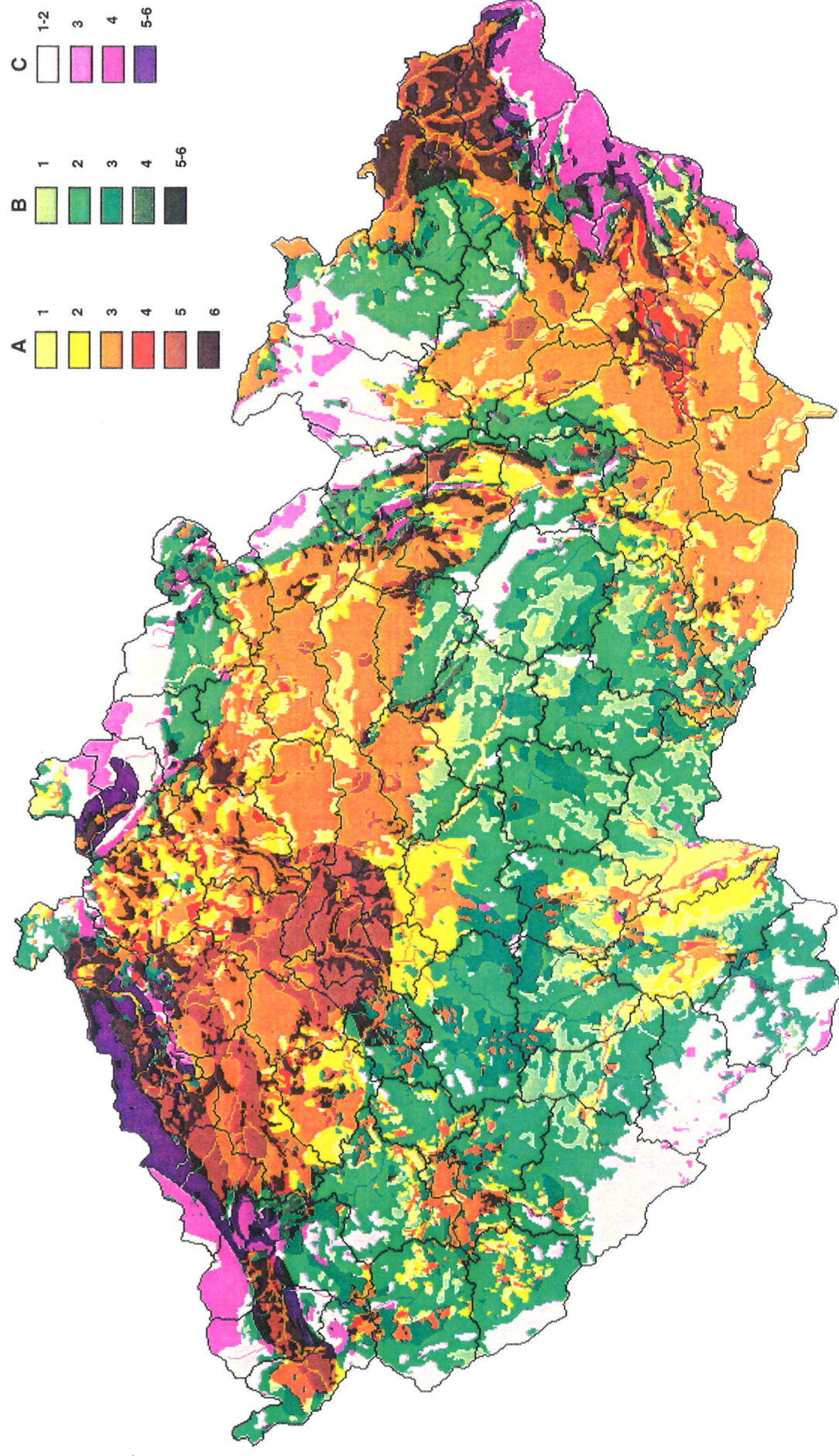
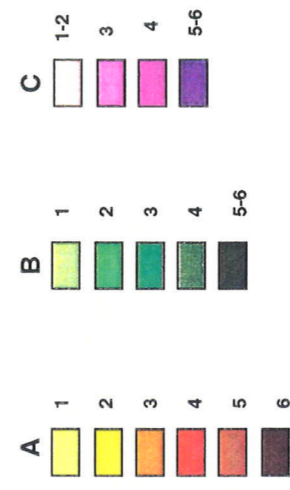
CZECH REPUBLIC LANDSCAPE SUSTAINABILITY

Landscape Potential for Sustainable Use



CZECH REPUBLIC LANDSCAPE SUSTAINABILITY

Territorial Preconditions of Development



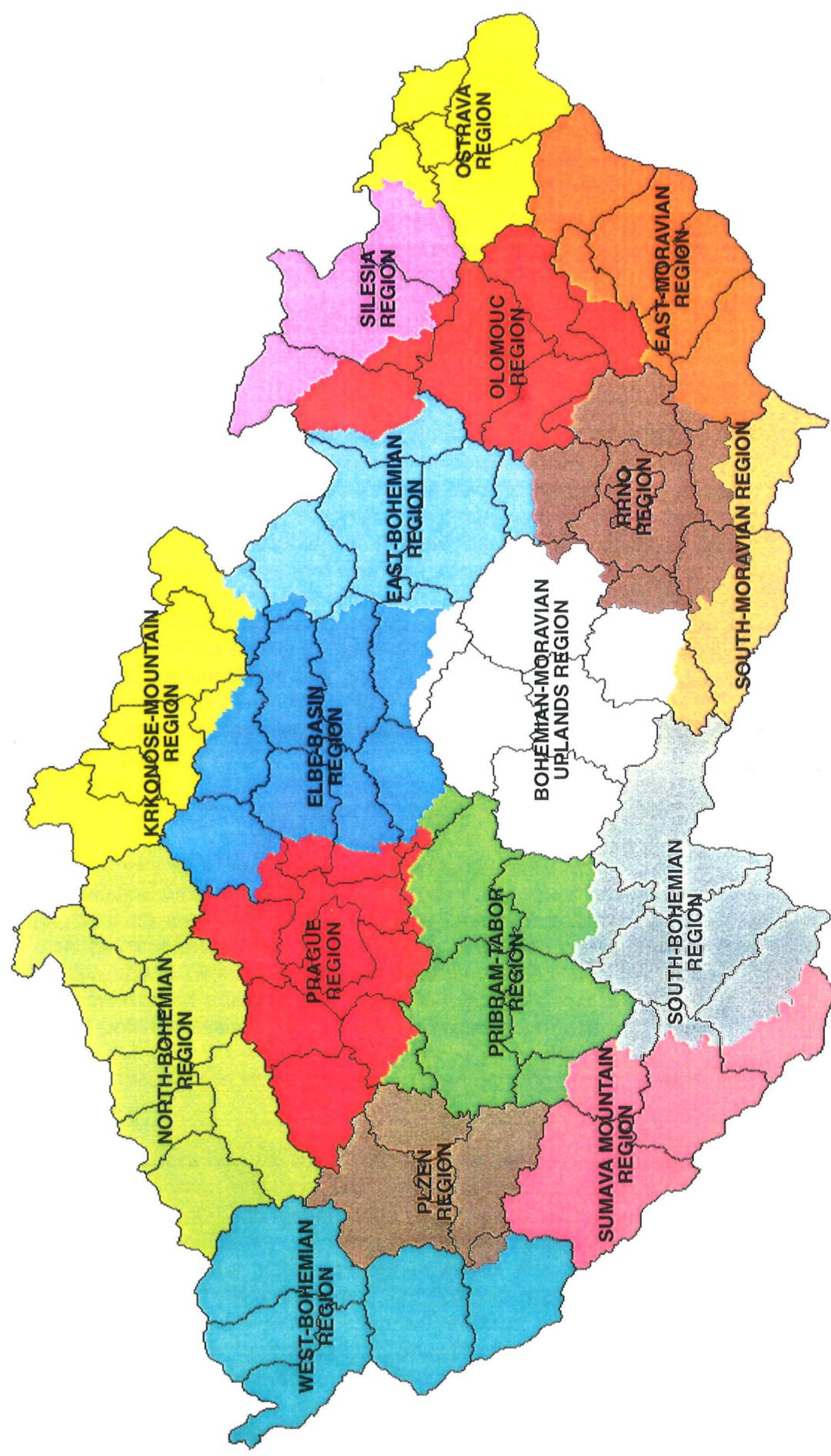
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Overall Landscape Productivity: A - high to very high B - relatively low to medium C - very low to low
Landscape Potential for Sustainable Use : 1 - high 2 - relatively high 3 - medium 4 - relatively low
5 - low 6 - very low

Map No.19

CZECH REPUBLIC

SOCIO-ECONOMIC REGIONS



The Implementation of Sustainable Development

On the previous pages we have tried to formulate a strategy of sustainable development. It may be an imperfect attempt, nevertheless it can be a challenge to us to try to work out a *positive and democratic alternative* to the contemporary way of development in a better and more perfect way. But it is not enough simply to formulate a strategy of sustainable development, it is necessary to push it through as well. Who and how can one accept the implementation of this strategy and how can one help?

First of all, there are *citizens*, individuals. Although it seems that the majority of inhabitants are apathetic towards environmental problems, in reality a great shift in the attitudes and interest of the inhabitants has taken place in the last twenty years. Even at the beginning of the 1980's, environmental problems were understood by the majority of citizens as the concern of a small number of specialists and somewhat eccentric "lovers of plants and animals". Today the situation is different and the sensitivity of the inhabitants towards the environment will increase. But it is important that the motivation is not only a negative one, caused by the fear of a coming crisis. To stimulate the activity of the inhabitants, hope, a vision of the way out is necessary and sustainable development should become a kind of hope. If sustainable development is understood and accepted by the citizens, it is clear that it will be reflected very strikingly even in the interest of political parties which compete for the support of voters.

Educational institutions and the mass media can help the most to influence public opinion. Mainly schools and teachers have a great power and responsibility. Unlike adults, children are very sensitive. If a teacher manages to interest them and win them over to ecological environmental policy, it is practically sure that when these young people grow up and some of them occupy important positions, they will behave in a much more responsible and conscious way, than our generation is able to. In addition, children are able to influence their parents the most. We, adults, are often inwardly ironclad against other people's arguments and we take our fellow-workers as potential rivals, as somebody who casts doubt upon our opinion and threatens our authority. But we are sensitive, receptive and open towards our own children. So a teacher can indirectly, through children, influence the opinions and activity of adults.

It is not necessary to stress how *the mass media* can influence public opinion. A newspaperman has a great influence and also responsibility which is totally comparable with the influence and responsibility of politicians. It is a mistake that ecologists and environmentalists are often able and willing to publish their attitudes and opinions only in professional magazines or newsletters of various movements where the converted preach to the converted. According to sociological research, television has unquestionably the greatest influence on public opinion. A little less influence is typical for national newspapers and radio. The influence of professional periodicals on public opinion is practically negligible. In the present period of "the information revolution", it is advisable to keep in mind all the time, that it is not the quantity of given information which is important, but what is more important is information that because of its content, layout and arrangement leads to recognition which consequently helps understanding.

Political parties and movements campaign for the support of the citizens (especially before an election). Also in our country the point is when and what kind of real political power will be formed, the power, one of whose main tasks will be the introduction of a strategy of sustainable development. A lot may be indicated by the 1996 election, but for the beginning of the transformation of our society to sustainable development the election in 2000 will be decisive.

The activities of non-government organizations are irreplaceable and their activities will grow with the development of civil society. But it would be possible to compare the opportunities and the means which they have at their disposal, to a shovel, which is used to turn over sand heaps. A political party that participates in government has means of a totally different level, in this comparison let us say corresponding to a bulldozer; so it can make the fundamental changes quickly and effectively. And the speed of change, or time is involved here as well.

Winning political parties are given two key positions for one period of government - a government and (partly) Parliament. Their fundamental disadvantage is mainly the short-term perspective of deliberations - till the next election. If the politicians do not want to commit political "suicide", they are often really limited by this perspective, at the same time the implementation of sustainable development needs necessarily also a long-term perspective of deliberation. Already from the definition it is clear, that the matter is the rights of future generations. How can we get out of it? It needs a strong and worked-out vision and politicians - personalities, who will have the courage to push through what they think is right, though for them personally it is disadvantageous in the short term.

The *president* is above direct political rivalry. It may be better to emphasise and strengthen his powers (moving closer to the U.S. model), he should be elected directly by the citizens for periods of fundamental social change. But this is not a topic for our consideration.

We think that the most important thing for the head of state is to point out the threat of global (not only ecological) crisis and with the help of this authority he can help us to look for and indicate possible ways out. For example - in 1992 the leader of the Czechoslovak delegation at The World Conference on Environment and Development was the federal Minister of the Environment Josef Vavroušek, an immensely qualified man, but "only" a minister. This delegation should have been led by the president and he was expected in Rio de Janeiro to address the world community and to help to better the relationships between the countries of North and South and these countries towards the Earth. The conference was at the same time as elections in our republic; this might be the reason why Václav Havel did not go to Brasil. Fidel Castro "adopted" his role and it is said he even got a round of applause for his speech. But in his presentation all moral appeals must have sounded false. It will be the same here in our country - it will be a wasted chance if there is no moral appeal for a responsible relationship towards future generations, towards living beings and nature as a whole as soon as possible from a state and moral authority - i.e. the president.

Also the *business community* is indisputably of great importance. Businessmen and their firms are sometimes considered to be "the greatest enemies" of the environment, mainly because of their strategy "to be equals to grow" and the resulting attitude to the environment and resources. But this is a simplified view. On the supranational, national and regional levels there are many firms and

corporations that try to behave responsibly (for some of them it is of course only a game, the creation of a better business "image"). The business world can be influenced by the (political) adoption of the principles of environmental economics and the adoption of appropriate economic tools. But it can also be influenced by culture and the knowledge that it is possible to make money from the environment, both from ecological machinery and from an emphasis on the greater longevity and utility of products. An immense economic influence will be concentrated in the hands of businessmen and above all in the hands of multinational companies. Multinational companies and monopolies are not under state control and this has been recently intensified by the further deregulation and liberalisation of international trade.

Also *trade unions* could have their role in the implementation of sustainable development. For many decades they struggled for the rights of working people, for better working conditions and dignified social security for workers. As with human rights, the right to a healthy environment started to be understood as one of the basic rights only recently, so trade unions could also accept their task to aim at a quality environment and the responsible behaviour of employers towards future generations and towards nature and natural resources. It should be a new impulse for their activity and role, above all in developed countries.

Churches will have an irreplaceable role. Churches everywhere, in our country mainly Christian churches, face, at the turn of the millennium, many serious challenges to which they should react, from environmental problems to questions of genetic engineering and biological revolution.

Generally and publicly churches adopt a very responsible attitude towards the environment resulting from the responsibility of man - the custodian of Earth for his Creator. But in real life churches give the impression in the field of environmental problems, as if they were sleeping or at least as if under the weight of other problems (restitution, charity, evangelical activity etc.) they did not have enough energy to fight for a more effective, responsible attitude not only towards human life, but also towards organic and inorganic nature.

However even from a secular point of view, churches have two excellent prerequisites for pushing sustainable development through:

- their perspective of deliberation is (unlike politicians and businessmen) long-term, the sense of our existence is to aim at eternal life and if we have this Earth, entrusted to us by God, we have a duty to take care of it as best we can.
- churches can very effectively influence the thought, behaviour and actions of their congregations in all layers of society and in all regions of the republic (unlike ecologists - specialists who are mostly able to address mainly educated people and particularly in towns, they usually fail to address people in villages).

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NON-GOVERNMENT ORGANIZATIONS AND SOCIAL MOVEMENTS WILL HAVE THE MOST IMPORTANT ROLE IN PUSHING SUSTAINABLE DEVELOPMENT THROUGH

Nevertheless we believe that people involved in trying to make a change through *non-government organizations and social movements* will have *the most important role* in pushing sustainable development through. The non-government and also non-profitmaking sectors is only starting to develop, but it will be more and more important, as it is in developed countries. It is a symbol of the readiness of people to take part in creating the future and to take joint responsibility for the development of society. Social movements have the power to bring great social changes to pass. However to achieve this aim takes years and sometimes even decades and the results of one person's efforts are often adopted by another.

Conclusion

We have tried to formulate the principles of sustainable development. But is it possible to put them into effect in real life in our country? It seems that we are still too absorbed in the ideal of a consumer-orientated society. The postrevolution idea of some environmentalists (including the writer), that our country would not have to repeat all the mistakes which were made by western societies in taking care of the environment, is still not being fulfilled. And even if it is possible to find a real political power that will manage to push this vision through by democratic means, what will the results be?

Because sustainable development was defined for the first time only in 1987 and because its implementation means a lot of gradual but fundamental changes not only in the economic and legal systems, but also in other fields, we can expect a lot of problems which we are not able and which are maybe not possible to foretell. It is even possible that a country, which accepts a strategy of sustainable development and starts to implement it, can expect resistance to it. Society can be taken by surprise by the number and size of problems and after a certain time it can (through election results) decide to abandon this strategy of development. This, however, is a risk which is taken by those who go first.

Are there in the world some countries which could act as initiators of change and as catalysts of these processes? Maybe there are.

The U.S.A. has as vice-president a man who supports the transformation of his country and the world to a sustainable way of life. Al Gore devoted to this question a book which became a bestseller in many countries: "The Earth in Balance". He suggests a new, ambitious global Marshall plan which would try to save the environment and the dignity of the lives of all the inhabitants of the planet through 5 strategic aims: the stabilization of the world's population; the fast establishment and development of ecologically economical technologies; complete and general changes in the economic norms used for the evaluation of the ecological impact of our decisions; the discussion and approval of a new generation of international agreements; the formulation of a common plan for the education of the citizens of the world about the environment of the planet.

As an integrating aim of the whole plan there should be the creation of such social and political conditions which would - especially in developing countries - most contribute to the forming of a sustainable society, i.e. above all social justice (including equal ownership of the land); the upholding of human rights; a guarantee

of adequate nutrition, housing and health care; higher literacy; greater political freedoms, taking part in controlling political life and the responsibility of governments towards their citizens.

A traditionally good attitude to the environment is typical for the inhabitants and governments of Canada and the Scandinavian countries. The Scientific Council of Canada as early as 1975 stated: "If there is a priority matter, which should determine the orientation of scientific policy in the coming decade, it should be an essential deviation from present-day consumer society, especially in the sense it is understood in the industrialised world, in the direction of what we call a conservator society."

Norway and the Netherlands are an example of very good cooperation between environmental non-government organizations and government institutions. For the time being we can only dream about the healthy self-confidence and the involvement of the citizens in the relationship to state authorities. The Netherlands and Scandinavian countries also rank among the most generous and active countries in help for and cooperation with the countries of the developing South.

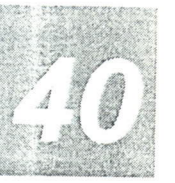
Even among less industrial countries it is possible to find "signs of hope". Costa Rica has worked out perfect plans for the protection of the environment, above all its tropical rain forests. This country is surrounded by politically unstable states and in spite of this it has no army and is a democratic country. Costa Rica has a chance to be a model for other not too rich countries in pushing sustainable development through.

The well-known example of the Indian state Kerala has become famous all over the world. India is a poor developing country and Kerala is a poor South-Indian state. The government of the state is implementing ambitious social, health and educational programs. People have a chance as in hardly any other developing country to develop their human potential.

Israel is a country exhausted by constant tension and quarrels with surrounding Arab states. But Israel has possibly the best agriculture in the world (at least in some branches, as for instance irrigation and cattle rearing) and enormous human potential. After a 2,000-year exile, Jews have brought the experience and inspiration of many cultures into their country. They are a nation with a several thousand-year history. They have changed the countryside, in which they live, from deserts, swamps and rocks into a country with a western European standard of living in the course of nearly one hundred years. If they were not forced to spend so much energy on the defence of their country, it would be they who could find the key to effective help and cooperation with non-industrialised poor regions.

There are other countries or groups of countries. The South African Republic where in the next few years chaos may rule or, if they manage the transformation from apartheid to democracy, the South African Republic may become an "engine" in changing southern Africa into a prosperous region.

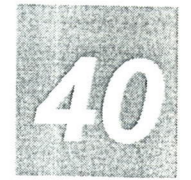
An enlarged European Union may find its mission in sustainable development. Development, traditionally understood as an increase in the standard of living and measured by an increase in gross domestic product, will not be tempting for Europe any more. Partly because of competition with cheap labour and work efficiency in the countries of the Pacific Regions, we do not have a chance in a long-term



IF THERE IS A PRIORITY MATTER, WHICH SHOULD DETERMINE THE ORIENTATION OF SCIENTIFIC POLICY IN THE COMING DECADE, IT SHOULD BE AN ESSENTIAL DEVIATION FROM PRESENT-DAY CONSUMER SOCIETY



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perspective, partly because the present efficiency of production may already be sufficient and its only further quantitative increase will not satisfy us any more. It is necessary to look for new quality. Maybe in this way Europe will be able to start cooperating with the African continent again. But not any more as with dependent and colonised countries. Europe can enrich Africa with technology and knowledge connected with the mastery of matter and the production of material products. Africa can enrich the old, good but tired and too one-sidedly rationally-orientated Europe by its emotionality, vitality, and ability to make direct contact with nature.

On the global level it will also be necessary to make essential changes if the lives of people on Earth should be sustainable in the long term. It concerns above all the most important secular global institution, the United Nations Organization. Especially recent experience from Somalia, Rwanda, Bosnia and other crisis areas is convincing evidence that the UNO in its present-day state is out-dated, too bureaucratic, expensive, narrow-minded, without essential powers and so not very useful. But this should not lead to the rejection of global institutions but to their basic reform.

Josef Vavroušek suggested that the UNO should be based on four fundamental corner-stones:

- a UNO security system whose task would be to resolve international conflicts with the help of peaceful means and which would be controlled by the UNO Security Council.
- a UNO economic system which should support balanced global economic development with the help of suitable financial, trade and other measures. It would be controlled by the UNO Economic Council.
- a UNO social system concentrating on the support of culture, education, health care, social insurance and similar activities, controlled by the UNO Social Council.
- a UNO environmental system orientated towards the protection and regeneration of nature generally and the environment of man, controlled by the UNO Environmental Council.

Each system would be worked-out not only at the global level, but there would be similar continental or national and regional centres, ensuring the functioning of the links between these systems in the framework of single national levels.

Besides the four corner-stones described by J. Vavroušek, there should perhaps also be established one "complementary" corner-stone for non-government and non-profitmaking organisations, there should be established a fundamental global legislature (a Constitution and a globally acceptable understanding of human rights) and a global tax system. Global matters should be specified and it would be good for states to give up part of their national sovereignty. Today there are four possible ways national states can behave towards the UNO:

1. to ask for its abolition;
2. to try to reform it;
3. to provide the UNO with only the most necessary financial contributions and leave it to live a poor existence;

4. to support selectively only certain activities and to link our contributions to them.

Great power is in the hands of supranational financial institutions, above all The World Bank and the International Monetary Fund. Projects, which have been so far supported in developing countries by these institutions, have been problematic and the conditions imposed were often hardly acceptable for social reasons to the receiving country. Nevertheless even here a change is desirable and possible. One British bank, for instance, gives shareholders slightly smaller dividends, but it guarantees that it will invest only in environmentally-acceptable schemes. It is highly successful which is a good sign of the commitment of the shareholders.

In the 21st century a key role will be played by important religions. They have a lot in common and a lot of differences. However at least three aims should bring members of various religions together - love, desire for knowledge and creativity.

Among other sayings from the Bible in Christianity you can find: "Love and then you can do everything". Or in the words of C. Caretto: "Everything will fall apart, but love, with which we have built up this world, remains".

Another saying is about knowledge. "You will recognise the truth and it will free you". To recognise the work of the Creator means to come nearer to him and recognise him and his will, because he shows himself in the created.

And in the end creativity - knowledge and love lead us to the need to create, to become "Homo creator", creative man. The thing is not what we will do here on Earth but more the efforts, intention and desire with which we work, try hard and create.

The world's religions, unlike political and economic organisations, think in a time perspective of several generations. The change of our way of life will demand foresight, time and a huge amount of energy. Not energy, as G. Barney (1993) says, which comes from coal, gas, crude oil and nuclear fuel, but spiritual energy, of which there would be enough to change the thinking and lives of nearly six billion people on this planet.

KNOWLEDGE AND LOVE
LEAD US TO THE NEED TO
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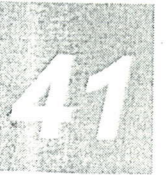
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