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D. Zachar: Forest damage by immissions	61	D. Zachar: Forest damage by immissions	(Low Tatras) Mts., Špišská Magura and Volovské vrchy Mts. are threatened by combination of regional and local resources of immissions. On the other hand, wide-spread small parts show local resources of damage (agglomeration of Bratislava, Košice, Nováky, Žiar nad Hronom etc.).	
E. Bublinec: Forest ecosystems of Slovakia and their functions	67	The main harmful material — SO ₂ , resulting from charcoal burning quickly increased in the second half of the last century which caused the damage of forest stands in the surroundings of industrial objects and towns where coal was used for heating. It is estimated that today approximately the half of European forests is damaged by immissions, i.e. about 150 mil. ha and this phenomenon may be considered as a catastrophic state. The increase of SO ₂ during the last years became slower, but the intensity of emissions NO _x , NH _x , C _x H _g , heavy metals and other materials permanently increases. It is caused mainly by motorism, agriculture and also by other branches of national-economy. The most marked damages in Europe appear after the year 1982/83. In the year 1987 the countries of Holland, England, Switzerland, Lichtenstein, Germany, Czechoslovakia, Belgium as well as certain republics of USSR, the territory of former GDR and Poland had the most intensively damaged forests by immissions — in average 40—60%. Denmark has very strongly damaged forests — it announces the highest official data from 22 European countries — 61% damaged forests. From the analyses follows that immissions influence first of all coniferous trees, than deciduous ones, to the most the stands older than 60 years, later also the younger ones. Coniferous tree species are damaged to the most in higher age-categories, deciduous tree species also in younger age.	V. Samek: Extinction of forests and nature protection	Proclamation of large-scale protected areas brings a new moment into the problem of protection — the need of zoological management of anthropogenized landscape including natural ecosystems as well as ecosystems changed by human activity. Regional management of large-scale protected areas sets out either from the knowledge of landscape ecology, from zoological strategy, but also from social-economical base. Today is particularly actual the formation of a new zoological strategy. To a greater extent it is valid for protected areas destroyed or damaged by immissions. Its way out ought to be first of all the "inventarization" of the problems and predictions of presumably probable development of forest damage by immissions. The author divides the large-scale protected areas in ČSFR into 3 groups according to the damage or endangerment and he marks 3 different possible approach to the present-day zoological problem of protected areas. He suggests that KRNAP becomes a biospherical reservation in which would be verified the management of forests damaged by immissions.
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D. Kollár: The tasks of social geography in the research of country inhabitants	101	E. Bublinec: Forest ecosystems of Slovakia and their functions	The area of forests of the Slovak Republic is 40.3% of its territory. From forest tree species beech (29.5 %), spruce (26.4%), oak (11.7%), pine (7.5%) and fir (5.8%) has the greatest representation. The yearly growth is approximately 5.4 mil. m ³ , yearly logging is 5.6 mil. m ³ , it means about 1.06 m ³ /inhabitant. Energetical value of the yearly growth is 855 000 t of fuels. The production of stock of game (1840 t) and forest fruit is also significant. Ecological and environmental function of forests exceeds the productional function several times. Forest is able to accumulate 200 l water on 1 m ² . Yearly productivity of oxygen of the Slovak forests presents more than 59 millions ton. A hectare of forest stand in the litter accumulates 150 000 kg of dust, 600—700 kg compounds of iron and aluminium, 100—150 kg of manganese, 90—100 kg of fluor and sulphur, as well as a large amount of heavy metals. Especially mountain ecosystems are damaged by immissions, crests and summits of the Biele Karpaty, Javorníky and Beskydy Mountains, but also the Nízke Tatry	
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J. Štursa: Reflections on the fate of the Krkonoše forests

In the year 1984 the Krkonošský Národní Park (National Park of Krkonoše) came to the list of the most threatened national parks of the world. Longer than 20 years the area is under the strong influence of immissions leading to quick decomposition of spruce forests, to serious symptoms of the damage of Swiss mountain pines and also to changes of non-forest ecosystems. The used forms of forest management are not adequate to the statute of the national park. On condition that the jurisdictional relations between the Forest management and institutions of state forests will be solved, is necessary to significantly limit the extent of destruction of mountain forests and begin with their reconstruction. In the final resolution of the international conference INCN held in the Krkonoše Mts. in 1990 is suggested that the Krkonoše Mts. ought to be put in the world network of biospherical reservations with all duties following from this fact for our society.

J. Kukla, E. Bublinec, M. Dubová: The stress of the Carpathian forest ecosystems by acid rains, nitrogen and sulphur

The crowns of spruce forest stands decrease the average reactions of rainfalls about 1—2 units of pH. By increasing density of forest stands the concentration of hydrogen ions in undercrown rainfalls decreases. The value of pH in water flowing down the stems of spruces decreases up to pH_{2.5}. Buffering ability of beech cover humus of rendzinoid soils is high and shifts the pH of soil solutions to optimum sphere from the viewpoint of the stability of forest ecosystems. The acidity of rainfall is influenced to the greatest by nitrogen and sulphur ions. The entrance of nitrogen into soil of Carpathian forest ecosystems exceeds the critical value 30 kg · ha⁻¹/year, the entrance of sulphur into soil of deciduous ecosystems reaches 30—35 kg, into soils of coniferous ecosystems about 80 kg on 1 ha/year. The most nitrogen in its both forms (N—NO₃, N—NH₄) is captured in the humus soil profile (15—16 kg). Accumulation of sulphates appears mainly in litter (1/3—1/2 of the total mass) and in the humus horizon of andosol cambisol rich in allophane. From the mentioned basic data follows that forest ecosystems have an important regulative influence in transformation of acidity of rainfalls and dynamics of nitrogen and sulphur.

A. Příhoda: Tumorous diseases of trees and shrubs

During the last years begins to spread dangerous diseases of tree species caused by microscopical fungi living in vascular bounds of wood and certain infections caused by bacteria. The complex of diseases, the so called "mass decline of oaks" is spreading again on which participate the fungi of close relationship with the originator of graphiosis of elms and always appear further diseases of vessels caused by fungi (tracheomycosis) in beech, ash, alder, birch, poplar trees and in pine and spruce. From bacterial diseases it is first of all "scarlet fever" of Rosacea and apple trees and shrubs, European decline of cherry and sour cherry trees and the so called Pferovian disease of poplars. The genus *Ceratocystis*, *Diplodia* and *Verticillium* belong to the most dangerous fungi causing tracheomycosis. The phycomycetous fungi *Phytophthora cinnamomi* brings on a new type of tracheomycosis causing the decline of horse-chestnut. Especially man brings on the spreading of tracheomycosis and bacteriosis by the traffic of plants and wood and also by weakening of plant resistance against infections that are reproduced in wastes from logging. Also chemical spray is used in combination with fertilizers.

V. Ložek: Forest decline in Czechoslovakia and Molluscs

Apart from a study concerning the changes of molluscan fauna of the Beskydy Mts. during the time-span 1950—1986 and various occasional observations there is no direct evidence for the impact of forest destruction on molluscs in Czechoslovakia. Despite this, from these data several conclusions can be drawn which may throw light on some aspects of this problem. They be summarized as follows:

- The depauperization of molluscan fauna in declining woodlands is due to two processes: 1) destruction of forest habitats and 2) direct impact of air pollution and acid rains on molluscs. Both processes are controlled by further factors as climate, substrate, chemical properties of the litter and also by ecological demands of particular species.
- The present-day destruction of montane and supramontane woodlands may lead to an extinction of snail fauna in this altitudinal zone. All less tolerant species characteristic of this zone are thus critically endangered, only *Arianta arbustorum* (L.), *Semilimax kotulai* (West.), *Euconulus fulvus*

(Müll.) and *Discus rudratus* (Fér.) are considered comparatively resistant.

- In lower lying areas the situation is more favourable, since the forests are less affected by airborne pollution and have a higher proportion of several tree species (linden, maple, ash, elm) whose litter provides favourable life conditions for molluscs, even strongly contaminated areas.
- Dust deposition injures the molluscan fauna much more in open country habitats than under a dense forest cover as documented in the area of Prague (Praha).
- Dendrophilous species representing the main component of woodland malacocoenoses in the montane and supramontane zones are most endangered, this is particularly true of *Clausilia cruciata* Stud., *Pseudofusus varians* (C.Pfr.) and *Macrogastra badia* (C.Pfr.).
- Pedophilous species living on the soil surface are less affected, particularly in sites with Ca- or Mg-rich bedrock or with litter predominantly consisting of leaves of favourable trees (linden etc.). This is true even in areas with high air pollution.
- Species living in screes are strongly damaged by dust deposition accumulating in free crevices separating the stones.

In this situation it is evident that the most endangered malacocoenoses are those of montane and supramontane predominantly coniferous forests in higher mountains of the Bohemian Massif, since these consist of acid rocks and are strongly affected by acid rains and air pollution which lead to progressive woodland destruction.

I. Štefančík, A. Cicák: State of health of forests in chosen research objects

The article states the negative influence of immissions on the state of health of forests. The extent of forest damage in Europe determined within the frame of International cooperational programme of evaluation and monitoring of the effects of air pollution on forests is mentioned. According to it in Slovakia has been damaged by different intensity 85% of forests. The aim, resp. the content of international monitoring and also the classification of damage of forest by immissions according to defoliation and decoloration of assimilative organs is characterized in more detail. In Slovakia the Research Institute of Forest Management in Zvolen deals with the monitoring of the state of health of forests — it

has developed the network of 111 permanent monitoring areas.

P. Vreštiak: Leaf area of tree species in town environment

The leaf area is one of the main quantitative indices of the size of photosynthetic apparatus of tree species. The total size of leaf area of tree crowns as well as its spatial distribution is specific for each taxon. Also the increase of leaf area during ontogenesis has a specific course according to tree species and conditions of environment. According to the dynamics and intensity of changes in increase of leaf area the author divides deciduous trees into 9 groups. Almost the half of the deciduous tree species growing in our country does not reach the leaf area of 500 m². In the course of 50 years the largest leaf area has *Aesculus hippocastanum* L., large leaf area has *Sophora japonica* L., *Acer saccharinum* L., *Robinia pseudo-acacia* L. etc. — they ought to form the base of town park composition. Quickly growing tree species reach during their short development only small or average leaf area. In the course of 50 years the majority of domestic species has only average or small leaf area.

D. Kollár: The tasks of social geography in the research of country inhabitants

Long since the behaviour of man, town and country inhabitants was in the centre

of attention of social geography. The author mentions certain examples from its history, he explains the aims of this branch in general and in our country. He states that social-geographical knowledge of space-social relations in the research of country inhabitants is completed by investigations of other branches and it can be applied in elaboration of prognoses of social development, as well as in different alternatives of management and decision in economy as well as in society. New comprehension of social geography and new comprehension of the country problem enable that social geography reaches interesting results of knowledge of the way of life and behaviour of country inhabitants in cooperation with other branches of science.

D. Chovanec: Present view of wood structure

Rastering electron microscope enables the view of the microworld of particular beauty with details characteristic for certain tree species — a part of the article are 22 photos. The author points at cell elements ensuring water transport in the stem of dicotyledonous plants. The circulation of water in the stem of tree species is ensured by vertically oriented cell elements different in the three types of wood structure of our tree species. In coniferous tree species with homogeneous structure the conductive function has

spring tracheids. Elliptically porous deciduous tree species have large differences in the size of conductive elements — spring and summer vessels (oak, ash elm, acacia, mulberry). Other tree species are spread porous with decreasing vessels from spring to summer wood. Basic difference in anatomic structure of coniferous and deciduous tree species is connected also with the speed of water in stems. In deciduous tree species the speed of water was established 1–2 m/hour, in coniferous tree species it is only 20–40 cm.

P. Zach: The function of cambio- and xylophagous beetles (Coleoptera) in spruce ecosystems

The author evaluated the importance of cambio- and xylophagous beetles (Coleoptera) in spruce ecosystems and he pointed at their some most important functions. The testing and sanitary functions belong to them, certain species of cambio- and xylophagous beetles introduce dangerous diseases and their important function is also the decomposition of organic matter. From the article is evident that beetles settled in bark, bast and wood of spruces are not only the so called forest pest damaging the aims and purposes of forest management, but they are very important components of forest biocoenosis that is necessary to be protected as a complex.

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