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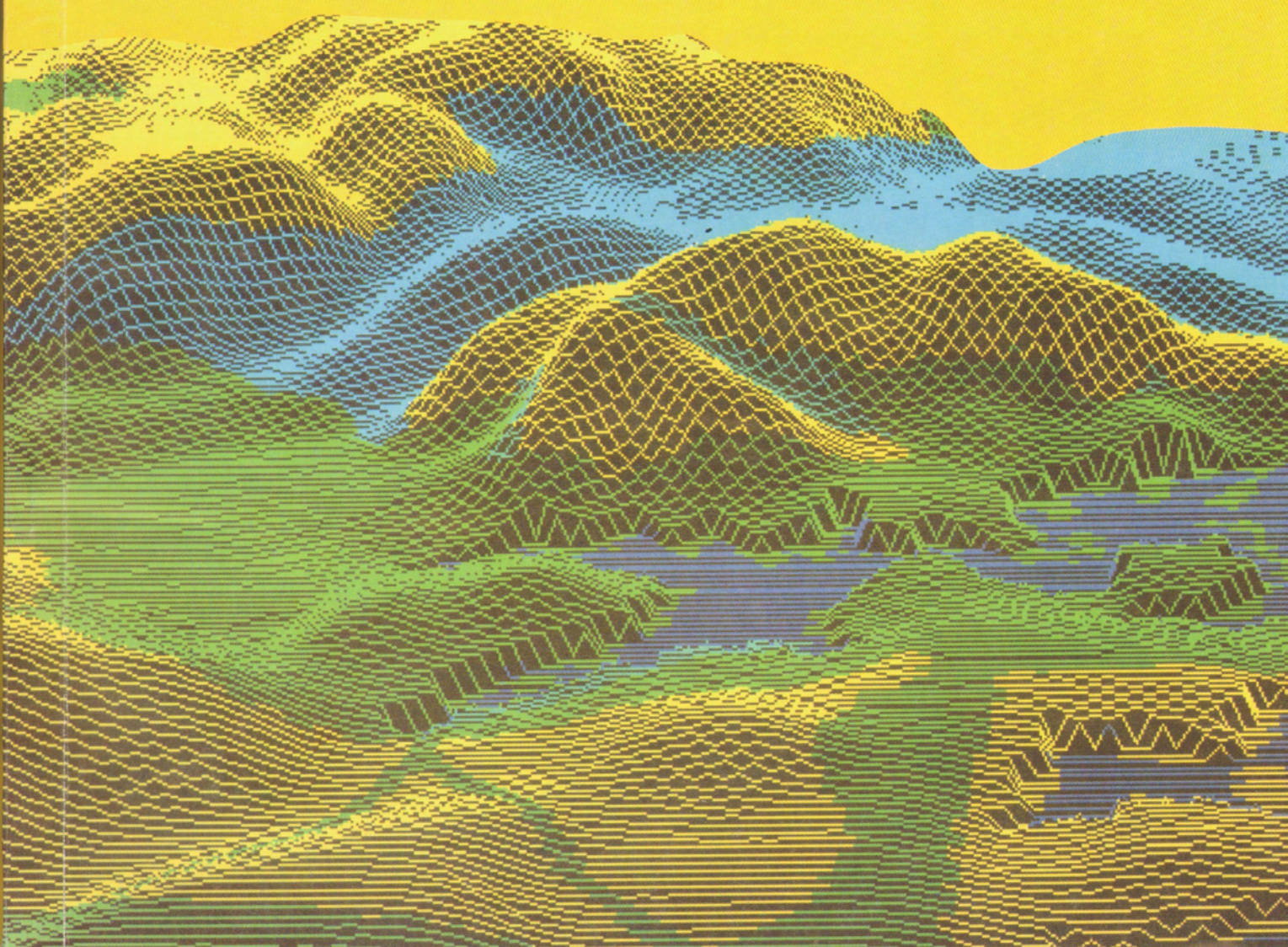

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GREEN SPACES AND URBAN SUSTAINABILITY IN BUDAPEST

István TÓZSA

Abstract

The past and the present of green areas in Budapest is subjected to an analysis and major sustainable conditions are formulated for future development. Land use development in the city is assessed as related to greenery as well as responsibility and role of politicians in green space management.

Shrnutí

Je zkoumána minulost i současnost zelených ploch v Budapešti a formulovány hlavní trvale udržitelné podmínky pro budoucí rozvoj. Je hodnocen vývoj ve využívání pozemků ve městě ve vztahu k zeleni a odpovědnost i úloha politiků při udržování a obhospodařování zeleně.

Key words : land use, green areas, sustainable conditions, Budapest

Introduction

'There are more cars than trees in Budapest' reads a headline in the environmental supplement of a leading Hungarian daily paper on 2nd December 1994. Since 1965, the number of cars many of which have two-stroke motors have increased twentyfivefold in Budapest alone. Not considering the cars of tourists, they number today some 600,000 -- more than the trees within the city limits. The areal proportion of the green surface is far less in Budapest than would be desired. Economic pressure at present does not seem to encourage the protection of green space. Building, selling business centres, hotels, garages, apartments, et cetera are much more profitable in the short term than creating new parks or even maintaining the existing ones. And at a time when monetary deficiency rules the economy on government level, the civil servants of the municipality are unable to pay adequate attention not only to the parks but to basic health and social welfare duties as well. After this dark picture, let us examine the past, present and possible future of the green areas in Budapest.

Green spaces in the old urban structure

The present site of Budapest had always been affected by wars and armed conflicts, in fact up to 1956. The mediaeval cities of Buda, Pest and Óbuda were destroyed several times during the Tatar invasion (1241-42), the Turkish wars (1541- 1686), the war of independence against the Habsburgs (1848- 49), World War I and revolution in Budapest (1918-21), World War II (1944-45), and the revolution of 1956. The first parks and gardens, however, were created during the 18th and early 19th centuries in Buda and Pest. After the Turks were driven out from the area, well to-do officers of the Austro- Hungarian Army and members of the aristocracy began to obtain pieces of land in and around Buda Castle and Pest. They had mansions and palaces built, surrounded by gardens and parks. The original locations of the first, most famous parks of Buda and Pest can be seen in Figure 1. In Óbuda, it was Count Zichy whose family developed a garden in the 1700s at the present bridge head of Árpád Bridge. Unfortunately it has been almost completely destroyed. The same thing happened to the once famous garden of the Száraz-Rudnyánszky Palace at Tétény, in the southern edge of Buda. Though these parks had survived almost 200 years and the wars, they were really destroyed and cutoff after 1945 when the palaces were nationalised and the new state institutions occupying them decided to use the so far green spaces for other purposes, rather than maintaining public gardens in them. The Horváth Garden in Buda used to be a famous public park in the beginning of the 20th century. What remains of it is a narrow park, or rather a broad row of trees between two main roads at the northern foot of the Castle Hill. The "Vérmezö" (Blood Meadow) is also a remaining park north of the Castle. The Orczy Garden used to be the largest park in the Pest side. In the first part of the 19th century the Hungarian Army bought the area and had a military academy built in the middle of it. Thus the public character of the park was reduced, though its real destruction occurred after 1945 when hospitals, the ELTE university, a bus terminal, a shoe factory, a sport club, a summertime pioneer camp and other institutions divided much of its original territory. Today a small fraction of the Orczy Garden has survived with a small lake in the middle. The Nádor Garden at Lágymányos

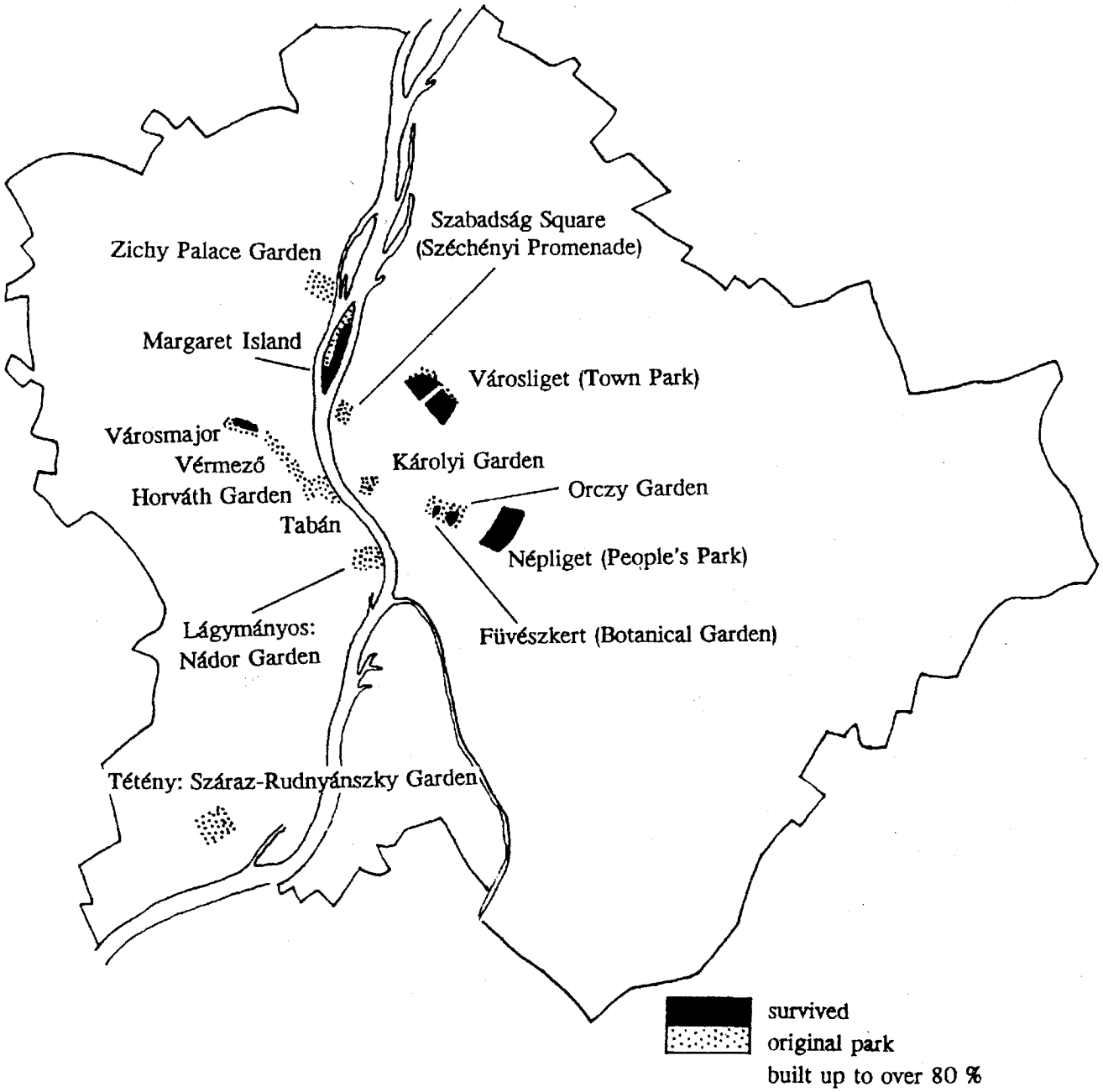

Fig. 1. Locations of the old parks and public gardens in the historical Budapest (after Gombos Z. 1974)

(southern part of Buda) was severely destroyed during World War II and it virtually disappeared after 1945. The Károlyi Garden in the heart of Pest has also been reduced to a tiny green space. The Hortus botanicus universitatis, the garden of the university (the Füvészkert), used to be adjacent to Orczy Garden. Much of its territory was occupied by medical clinics, however. Today the ELTE University cannot afford its maintenance cost and the municipality is not in the position to undertake a new park to look after. The Városmajor is also an old public park in Buda. Though less in territory, it has been reconstructed in recent times. The Városliget (the Town Park) is perhaps the most famous public park in Budapest, housing the Vajdahunyad Castle Museum, the Zoo, the Amusement Park, the Circus, some cultural and tourist institutions and a lake that is an ice rink in winter. Consequently the once conterminous green space of the park is interrupted now and then by built up surfaces. Otherwise the park is one of the best-kept and most visited green surfaces of Budapest. The largest park in Budapest is the Népliget (the People's Park) whose first trees were planted in the mid 1800s to bind the wind-blown sand of the Pest Plain. It suffered its greatest loss during the siege of Budapest in World war II. Margaret Island, in the Danube, lies in the middle of the city. Its wonderful park, which used to cover the whole island, was first constructed in the very beginning of the 19th century. Today there are numerous sporting

and tourist facilities (hotels and restaurants) on the island as well. Only a very small fraction remains from the once famous Buda park, the Tabán, at the Buda bridge head of the Erzsébet Bridge.

When summarising the history of the public parks in Budapest, the following statements can be made:

- they all were created during the 18th century by the members of the Austrian or Hungarian aristocracy;
- they all were designed to follow the patterns of either of the then fashionable 'English garden' or the 'Versailles style';
- they were all situated originally in the area what can be regarded as the central part of Budapest today;
- they were all more or less reduced in size in the 19th century by public buildings;
- they all suffered severe losses during the two World Wars, especially in the Second when heavy fighting, bombardment and shelling took place in Budapest;
- some of them totally disappeared after the nationalisation policy of the communist government was introduced and most of them were greatly reduced in size either by public or industrial institutions.

Land use and the greenery in Budapest

Had the town planning after 1945 had the means to preserve and take care of the old public gardens and parks in Budapest, the inner structure of the town, the City, could be richer in green space today. Previously, the political setting encouraged industrial and social development above all, even with such sites located in the parks. And, in the past decades, the planned economy prevented the district municipalities and the capital from restoring the old green spaces or restructure the inner city. The main factors (besides the shortage of maintenance money) causing the eventual degradation of the originally rich park reserves of Budapest are:

- the parks being dissected;
- their ownership being unambiguous, and
- their usage being not regulated.

Apart from the planned and built parks mentioned above, the major green spaces in today's Budapest include what remains of the forests of the Buda Mountains within the city boundaries (1), the remnants of the alluvial forests of the Pest Plain (2), the major cemeteries (3), the horse racing fields and the airfield of Ferihegy. In the outer districts of Pest there are agricultural fields as well. The major squares in most cases have trees, though they cannot be regarded as real parks (4).

(1) There was a very favourable physical endowment within Budapest that resulted in an abundance of greenery on the western half of the town: the Buda Mountains situated on the right bank of the Danube River were densely covered with forests. In fact, today it is the most endangered green space in Budapest. There is virtually nothing (no regulations and means) that could stop their gradually being built up with residential estates and villas. The remaining greenery of the Buda Mountains within Budapest from north to south include the Ezüst Hill (208 m), the Csillag Hill (237 m), the Csúcs Hill (447 m), the Hármashatár Hi ll (497 m), the Hárs Hill (458 m), the János Hill (529 m), the Széchenyi Hill (439 m) and the Kakukk Hill (430 m). The Szabadság, formerly Swabian Hill and, of course, the Castle Hill are now entirely built up. The easternmost members of the Buda Mountains are totally encircled by densely built up, mainly residential areas. They are declared as natural conservation areas, though now and then one can always spot new buildings on their slopes. They are the Mátyás Hill and the Ferenc Hill, hiding wonderful hydrothermal karst caves in their depth, the Martinovics Hill, the Gellért Hill (235 m) offering the tourists the most famous view of the town and the Sas Hill (259 m) being the most valuable nature conservation area with typical dolomite rock-slope vegetation. Figures 2-3 show how the gradual loss of the greenery is taking place in the Buda Mountains within the city boundaries. The green areas in 1943 (Figure 2) can be compared to the greenery in 1980 (Figure 3). It is only in the past few decades that the building up became very rapid though.

(2) The remnants of the alluvial forests in the Pest side include from north to south the Káposztásmegyeri Forest, the Páskomliget, the Halmi Forest at Pestlörinc, the Újtelepi Forest at Pesterzsébet and the Háros Forest in Csepel Island.

(3) The major cemeteries of Budapest also contribute to the dimension of green space with the largest, the New Common Burial Ground, being located in District 17 in the eastern part of Pest. Closer to the City there are the Kerepesi Cemetery on the Pest and the Farkasréti Cemetery on the Buda side in districts 8 and 11 respectively.

(4) The largest squares with trees in or in the vicinity of the City include the Köztársaság Square, Szabadság Square, Erzsébet Square, Kálvária Square and perhaps the Museum Garden. Others, with just a few trees in them, cannot be regarded as parks or gardens.

Figure 4 shows the present day proportion of the greenery and the built up areas within Budapest. Compared to other major Hungarian towns, Budapest is in a rather disadvantageous situation as far as the proportion of the greenery is concerned (Tab.1.) From the point of international trade, Budapest lies in a very favourable site. As the reviving business activity of not only Hungary, but that of the whole Carpathian Basin and Eastern Central Europe is beginning to concentrate in Budapest, the need for newer and newer office buildings is undoubtedly going to grow. All the multinational companies which have moved to Budapest wish to have their own headquarters and chain of shops and offices. They are either having them built in the centre of Pest

Fig. 2. Green areas on the Buda side in 1943 (Kovács M. 1985)

Fig. 3. Green areas on the Buda side in 1980 (Kovács M. 1985)

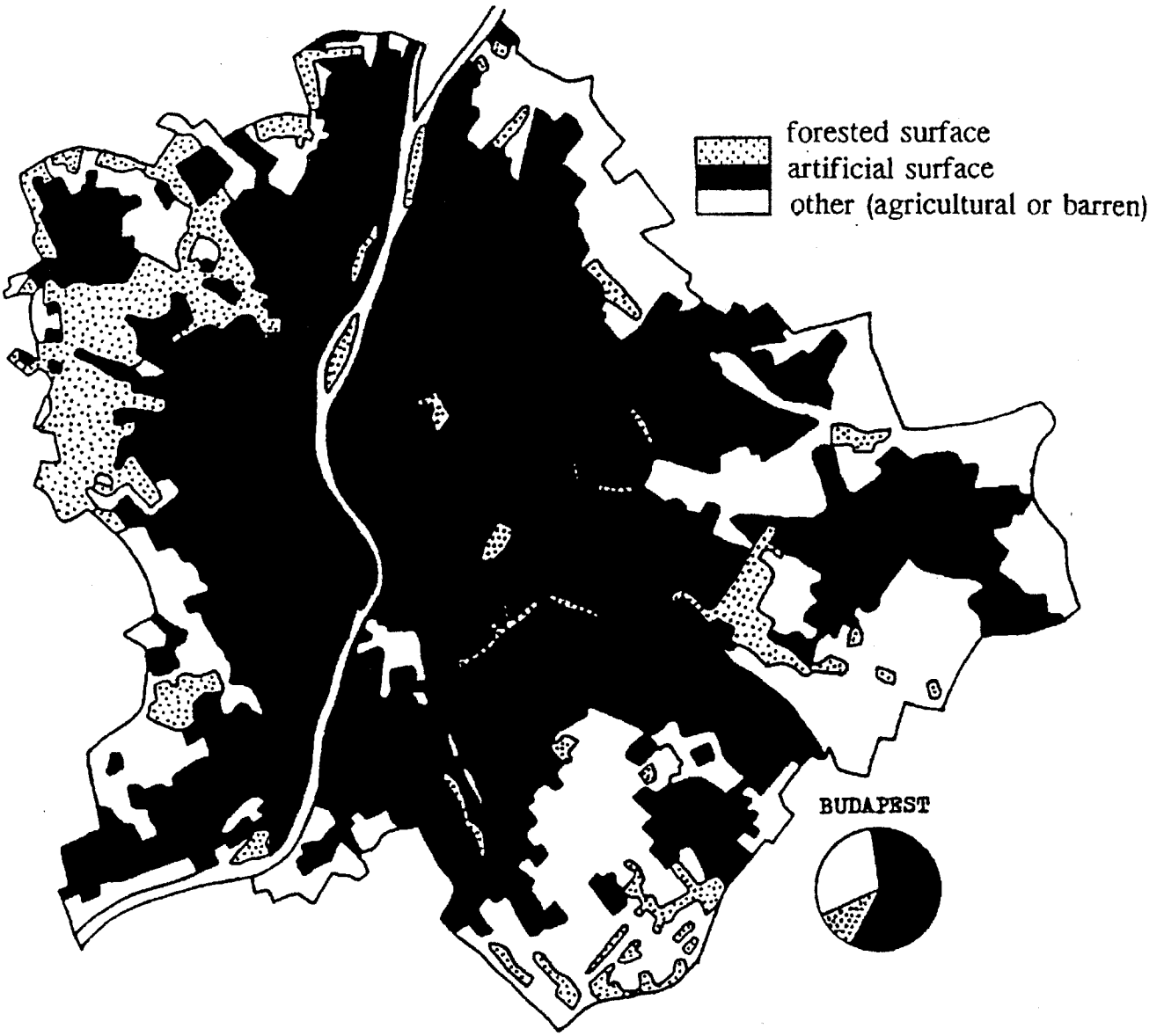

Fig. 4. Basic land use in Budapest in the 1980s (Tózsa I. 1989)

or on the Buda side of high reputation (in the 'green belt'). The centre is especially poor in greenery; the remaining green areas of the Buda Hills are especially endangered by the residential function. Thus both regions exposed to the multinational drive are among the most sensitive ones. Unfortunately, the situation is forcasted to worsen as far as the proportion of the green spaces is concerned. The proportion of the green surface per capita is the lowest in District 7 (0.2 m^2) on the Pest side and the highest is in District 12 (123.3 mi) on the Buda side.

Usefulness of the parks and other green territories in filtering the polluted air and improving the humidity of the air is widely known, so is their aesthetic value and role in urban recreation. In this, the ecological state of Budapest green areas is examined next. Figure 5 shows the state of the lichen population over Budapest. Lichen can be regarded as an indicator of the degree of air pollution or, in other words, the environmental suitability for trees to thrive. As it can be seen, the whole central part of the city is a lichen desert, representing rather unfavourable environmental conditions. On the one hand this situation caused by pollution renders the life expectancy of trees short and on the other hand the lack of the sufficient amount of trees themselves permits pollution to dominate environment. As industrial activity has decreased in the course of the economic transition and restructuring, the main source of air pollution is the ever increasing number of motor cars emitting nitrogen-oxides.

Table 1. Order of Hungarian county seats according to the ratio of green space and built-up areas

Town	Order*
Miskolc	143.14
Debrecen	138.24
Salgótarján	134.96
Veszprém	131.94
Eger	127.92
Tatabánya	118.80
Szekszárd	115.04
Pécs	88.20
Kecskemét	87.26
Zalaegerszeg	81.60
Nyíregyháza	79.68
Szolnok	78.22
Győr	77.48
Szeged	76.46
Békéscsaba	76.10
Kaposvár	59.32
Szombathély	57.46
Székesfehérvár	48.02
Budapest	**-11.72**

* Order is 3 times the areal percentage of forest minus all other land-use categories.

Before the intensive urbanisation took place in Budapest, the original vegetation of the hilly Buda side consisted of mainly turkey oak mixed with oak (Quercetum petraea-cerris), hornbeam groves with oak (Querco-Carpinetum) and pure oak (Orno-Quercetum) forests. The flat Pest side had a vegetation of sandy oak (Festuco-Quercetum) and alluvial forests of the Danube (Fraxino-pannonicae--Quercetum roboris). From the original 1,300 plant species in the territory of today's Budapest, some 100 became extinct in the past century. Beside the indigenous species there are an increasing number of neophytes, many being Mediterranean and sub-mediterranean species. In Budapest the most common, newly (in the past hundred years) introduced trees are American false acacia (Robinia pseudoacacia), catalpa (Catalpa bignonioides), celtis (Celtis occidentalis), western thuya (Thuja occidentalis) and juniper (Juniperus virginiana). Figure 6 shows the tree species constituting the rows of trees and many of the parks in Budapest. Soil in the urban quarters in Budapest is compacted, alkali and dry. The micro-climate at most places is arid, in winter it is often freezing. Owing to the concrete and asphalt surfaces, and the massive buildings accumulating heat in summer, the relative air humidity is very low. Gases and falling dust pollute the air. In the past fifty years, the maple and the elm trees have

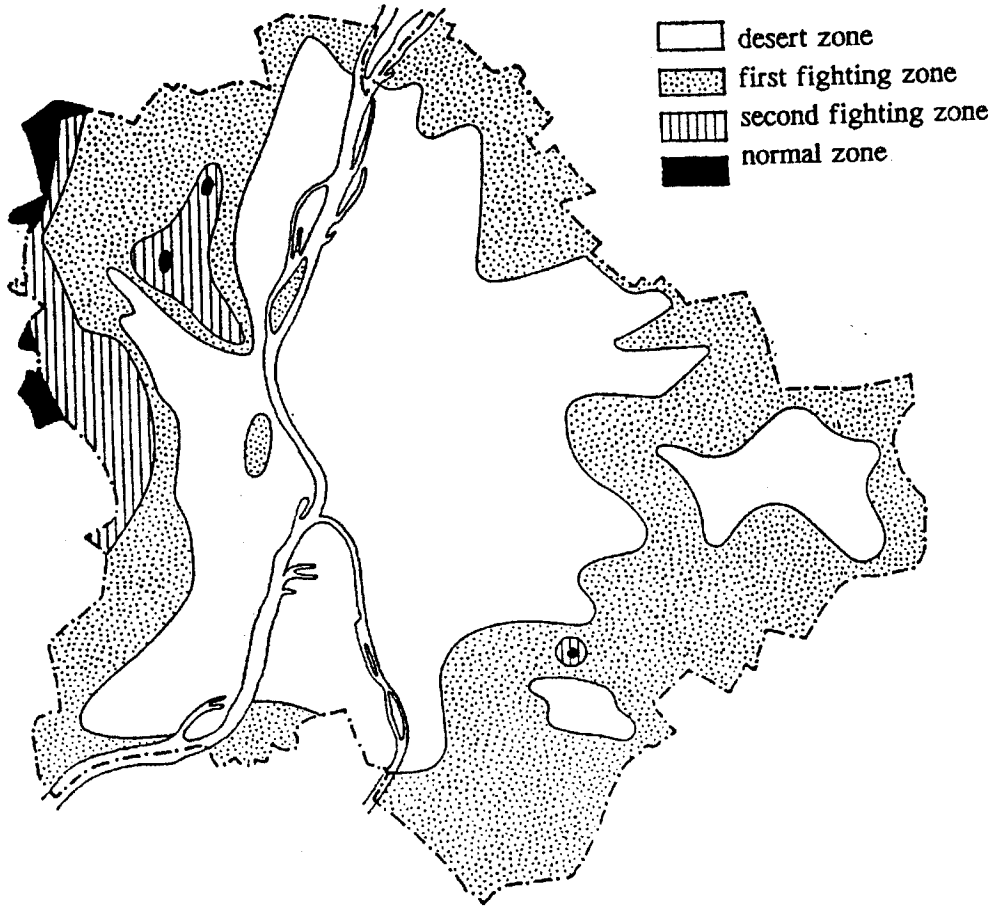

Fig. 5. Lichen population map of Budapest (Farkas E. 1982)

tended to die out the most. In Budapest sumach (Ailanthus altissima), celtis and acacias (Robinia pseudoacacia and Sophora japonica) have the highest adaptability to the severe urban environment (Kovács M. 1985); though sumach trees grow only wild. They are avoided by the Budapest Gardening Company, which is in favour of plane trees (Platanus acerifolia) and celtis instead.

Geographic research in the early 1980s considered a possibility to survey and map land use categories over Budapest through digital processing of multispectral scanner (MSS) LANDSAT images (Tózsa I. et al. 1982). The different land-use categories were mapped according to their physical property, namely their proportion of green surface. The densely built-up territory was defined in the training sites as having no green surface at all. The resulting map from the digital LANDSAT image classification can be seen in Figure 7 (see enclosure) as 'commercial and older residential built up areas'. Housing estates were defined as more loosely built-up areas (as 'modern residential'), garden suburbs were detected as having even more green space and weekend areas were selected as very sparsely built-up areas with much green space (under the title of 'orchards and recreational areas'. The parks and the Buda residential garden suburbs were defined as almost totally green (named as 'green residential') and the forest as totally green area. The LANDSAT land-use map sequence thus applied the proportion of the green surface to detect the certain land-use categories as far as they can be characterised through physical properties of the surface. These maps derived from LANDSAT data are

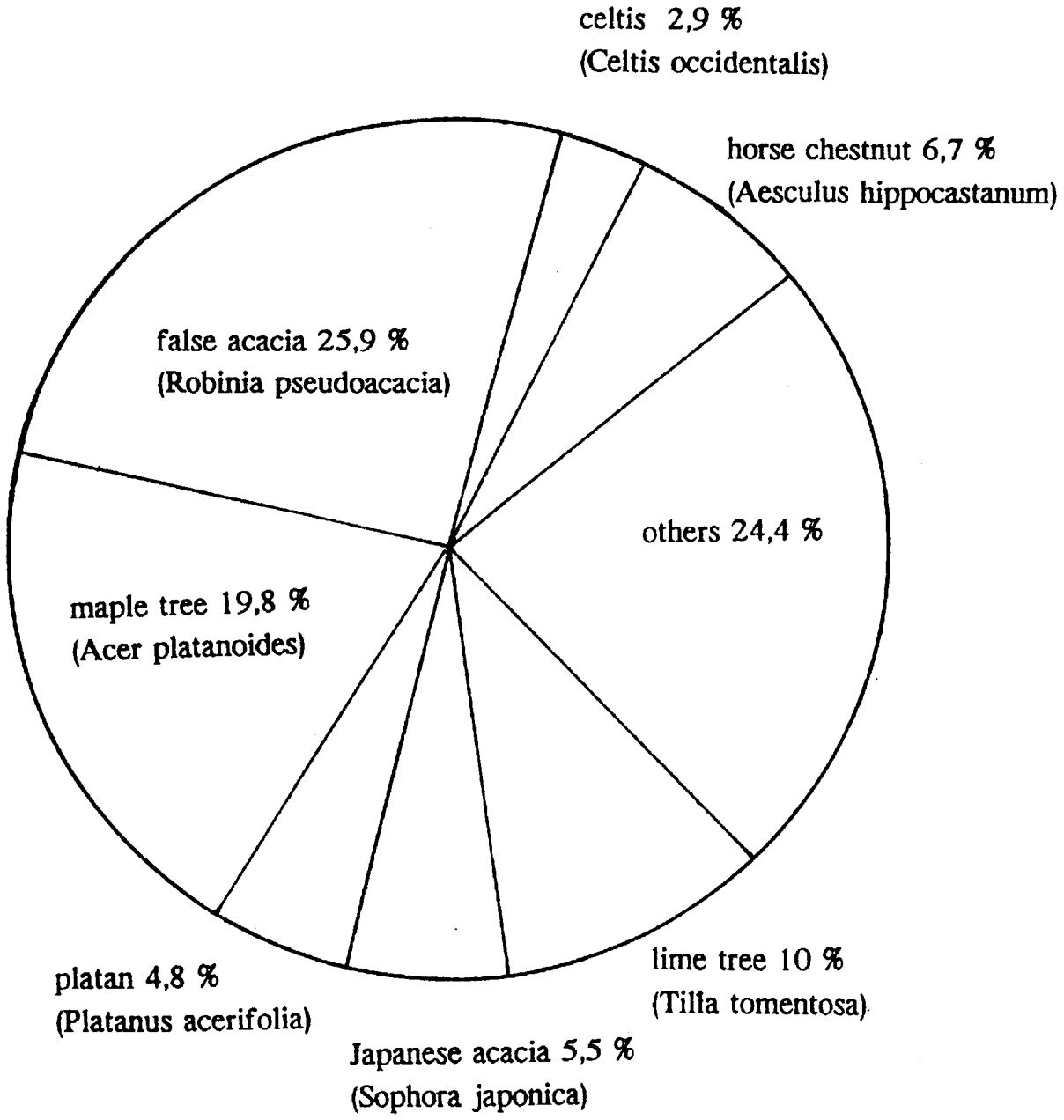

Fig. 6. Tree species composing the rows of trees and much of the public parks in Budapest (after Kokics T. 1978)

significant from the point of view of the survey of the green spaces. The municipalities and the Budapest Gardening Company have a registration list of the trees in the public parks and gardens and of the trees lining the roads and streets. Within the inner yards of many private residential estates, villas, gardens and even in the territory of industrial and transportation areas, there are more or less green surfaces as well: a few trees, bushes, grass or flower beds. The maps from the space images reveal the whole of the green biomass over the territory of the city. The proportion of the green surface compared to the artificial (asphalt, tile, concrete, iron and glass) surfaces show a decrease from 'forest' (90%) through 'green residential spaces', 'orchards and recreational areas', 'garden suburbs' and 'modern residential' to 'commercial and older residential built up areas' (about 10%).

Another urban ecological survey is that of Galambos J. et al. (1990), which concentrated on one of the inner districts of Budapest, the many-faced Józsefváros (the 8th District). Each green surface of the district was examined considering the average age of the trees, the general state of the park or garden or trees in a square, the degree of their being intersected by walkways, path or kiosks, shadow-effect of the surrounding high buildings (if any), the proportion of the biologically active (grass) and inactive (asphalt or gravel) surfaces within each green area, the rate of attendance, the micro-climate of the area (if any) and finally the degree of the damage in trees. On the basis of these eight factors, all green surfaces of District 8 were classified into qualified areas as relatively high quality, good, moderate and poor quality (Fig.8). Such spatial information can serve as a background information in the hands of the decision-makers of th e district municipality to maintain the parks, or to interfere where there is the greatest ecological need to do so.

Management of the green spaces in Budapest

In 1992, a new regulation (Határozat...1992) was introduced in the Mayor's Office of Budapest and in every district municipality 'to protect, to use and to maintain the green areas of the capital'. The regulation was accepted by the Assembly of the Capital and by each of the 22 (since then 23) district self-governments of Budapest. The regulation is to be applied to the public parks, promenades, rows of trees along roads and streets, inner gardens of public and industrial institutions, gardens and inner yards of housing estates and resort houses, green surfaces around public open- air

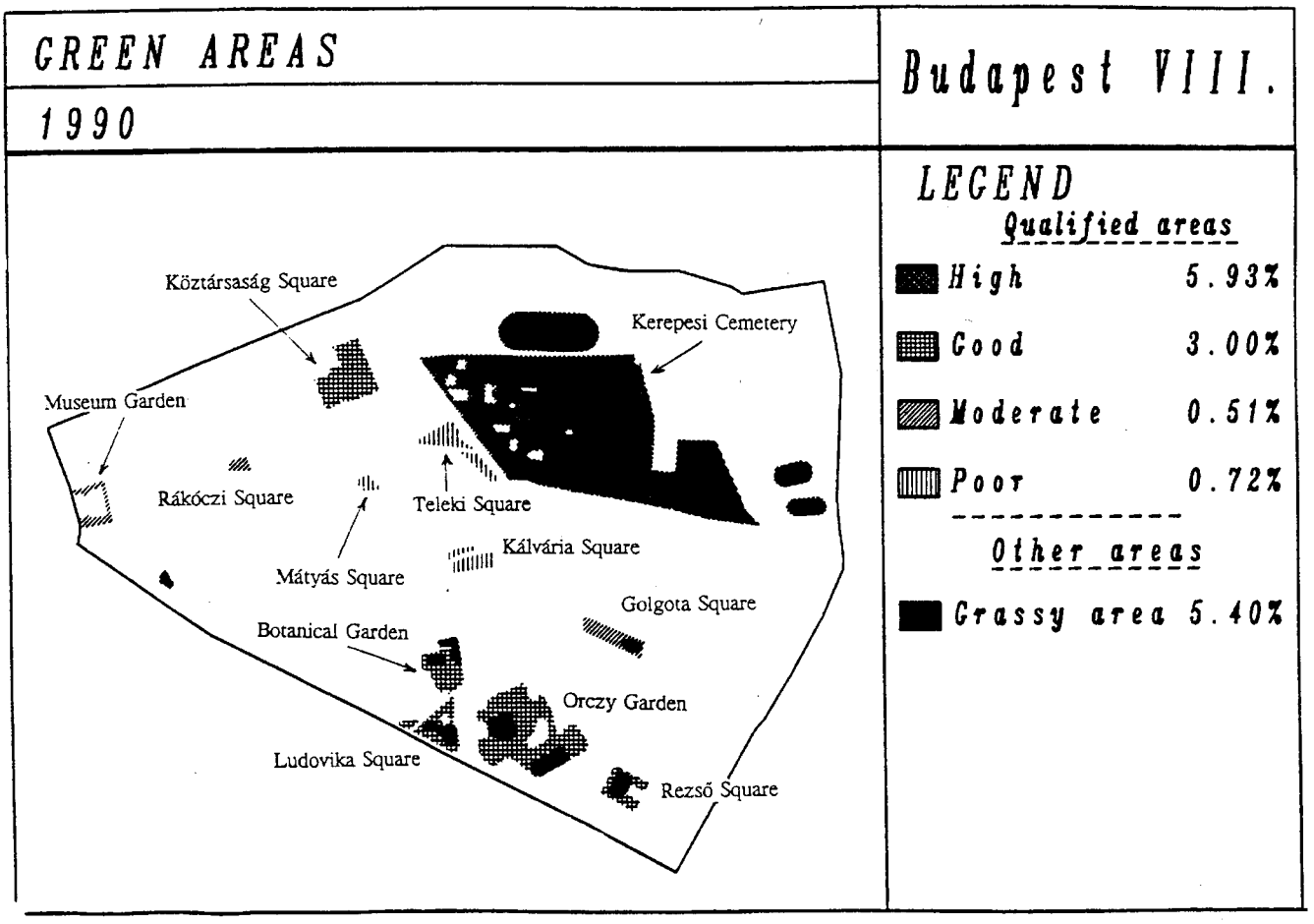

Fig. 8. The quality classes of the green areas in District 8 in Budapest (Galambos J. et al 1990)

pools or sport fields, botanical gardens, cemeteries, river and lake shores, islands in the Danube, residual marshlands, and nature conservation areas (Fig.9). The regulation does not apply to the forests situated outside the residential areas (they are under the Forest Act), privately owned orchards and fruit gardens and agricultural areas. The regulation aims to protect the green surfaces from damages, to replace the damaged plants, to prohibit land uses other than recreational in the green spaces and to maintain these spaces.

Since the green spaces in Budapest can be considered as an integrated system, their protection and development ought to be co-ordinated by one executive organisation, the Mayor's Office of Budapest City, putting into effect the decisions of the assembly of the self-government of the capital. It co- ordinates the activity of the districts' mayor's offices (the local authorities of the first instance) and the environmental protection authority. It has to report both on general urban planning, and detailed district level urban planning issues

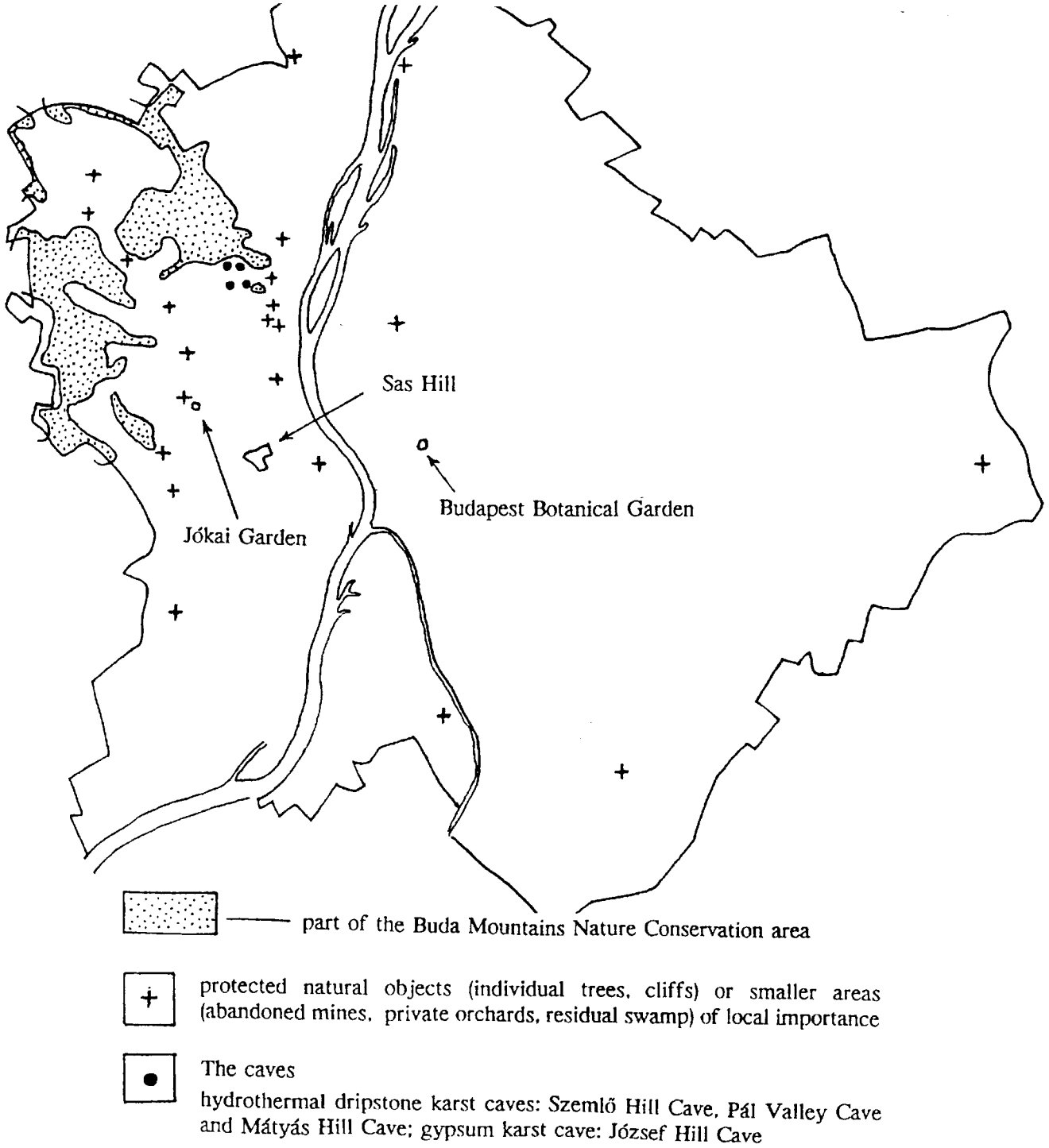

Fig. 9. Nature conservation sites in Budapest (after Rakonczay Z. 1992).

from the viewpoint of green preservation in Budapest too. The effectuation of the decrees and their supervision is the responsibility of the city-clerk.

Every person or office wishing to cut down a tree that is situated either in a privately owned or rented piece of land has to report it to the authority responsible for the area. Depending on the quality of the area it can be:

- the district mayor's office (in common residential areas);
- the Forest Survey (in forested outskirts);
- the Mayor's Office of the City (in a nature conservation area of local importance) or
- the Budapest Environmental Inspectorate (in a nature conservation area of national importance).

The authority may or may not give permission to cut down the tree and it can order that a tree be replaced or replanted. Permission to cut down a tree can be obtained if it is too old to replant or if it is dying, damaged or dangerously inclined to fall.

One of the most difficult tasks is to ensure that the bans on building construction should not be lifted in green areas. Another difficult task is to prevent the building activity from damaging the trees existing in the construction area. Permission to put the building into use should be given only after the planting of the new green surface is accomplished. This latter obligation is often neglected too.

Those cutting down or damaging a healthy tree without permission, lopping the branches inefficiently, or failing to replace trees by a deadline are committing a summary offence and are fined up to 10 000 Ft (100 USD) -- as the regulation reads. In petty offences, the fines are imposed by the district mayor's office.

The nominal values for each cut down tree have to be established regardless of the permission being granted or not. The standard is a 4 year old member of a row of trees along the street. Its value is 250 Ft (2.5 USD) taking the 1992 price. (Inflation may have raised the prices some 60 % by the end of 1994.) A 10 year old tree's value is tenfold (2500 Ft/25 USD). A 20 year old one is 10 000 Ft (100 USD), a 30 is 21 000 Ft, a 40 is 40 000 Ft, a 50 is 75 000 Ft, a 60 is 125 000 Ft and a 70 year old tree is 175 000 Ft (1750 USD). A protected tree, regardless of its age, costs 250 000 Ft (2500 USD) at the 1992 price level. The nominal values of the ill or already lopped trees are proportionally reduced according to a very detailed table. Besides trees, the nominal values of other green space elements are given in the regulation like those of pine tr ees expressed in metres of height; bushes expressed in one third cubic metres of their foliage; bushy pines (thuyas, junipers) per piece; hedgerows in half cubic metres per length in metres; soil cover in quarters of square metres; grass in square metres; and flower beds in square metres. Sums answering the nominal values have to be paid as a compensation to the Green Development Fund of the capital. This Fund is designated to support the development of Budapest green areas through tenders.

Maintenance and development of the green area is the duty of its owner or user. Technological steps and frequency of their application are included in the regulation in detail regarding the grass, paths, bushes, trees and soil, different kinds of flowers, hedges, children's playing grounds and fountains, benches, fences, dust bins, et cetera. Efficient ways of tree planting, pruning, fertilising, watering are also included in the regulation. The Mayor's Office of the capital and the Budapest Environmental Inspectorate work out a plan to develop the green surface within the city. Within the Mayor's Office of the capital it is the Environment Protection Department that deals with the green areas as well as with the pollution of the urban environment.

The cost paid for the protection, maintenance and development of the Budapest green areas is always to be covered by their owner or user (either by private or government institutions, or local residents). The expenses for the public parks and gardens and the nature conservation areas of local importance are covered by the Mayor's Office of the capital, while those nature conservation areas of national importance in the capital belong to the Budapest Environmental Inspectorate.

The responsibility and the role of policy in green space management in Budapest

As already stated above, the authority in the first instance regarding the management of the green spaces and facilities in the Hungarian capital is the local district municipality, of which there are 23 in Budapest at present. This applies to most cases in residential areas. In non-residential areas the management of the green spaces and facilities are the responsibility of various groups depanding on location and function. The most important groups are:

- co-operative farms or private farmers in agricultural lands;
- State Forest Survey in forested pieces of land;
- Budapest City Mayor's Office in nature conservation areas of local importance and
- Budapest Environmental Inspectorate in nature conservation areas of national importance.

The duty of these groups is to maintain, protect and develop the green areas within the Budapest city limits. In the residential areas, however, it is the responsibility of the local (district) municipality to exert the executive power in this respect, with the district clerk having the ability to appprove decisions concerning the management of green spaces. The technical effectuation of the decisions is then designed by the municipality's technical department. The technical department usually pays

the Budapest Gardening Company to work out actual required procedures and to carry out the field work.

Apart from the decisions regarding the petty offences, all decisions concerning the continuous protection and development of the green surfaces of the districts have to be first voted by the district's assembly (the body of the district's self government). Practically all decisions that require financial expenditures have to be first approved by the general assembly of the district's freely elected representatives. The body of the representatives is usually divided according to political parties in the districts' assemblies and in that of the City alike. In Hungary there have been 6 parliamentary parties since 1990. In the first post-socialist governmental period, the Hungarian Democratic Forum (MDF) held the majority in the Parliament. During the second round of elections for the representatives in the local authorities, the second strongest parliamentary party, the Union of Free Democrats (SZDSZ) obtained the majority. So from 1990 to 1994 the party members of the SZDSZ dominated the local policy of the municipalities in general in Hungary, though in Budapest the MDF also gained a majority in a few districts. However, the Mayor of Budapest (Mr. Demszky) and the majority in the general assembly of Budapest City belonged to the SZDSZ. So in the local policy (including green space management) the will of the SZDSZ tended to prevail. The meetings of the district assemblies often gave way to political confrontations and debates. In the 1994 national elections, the middle-right-wing MDF parliamentary majority was overthrown by the middle-left-wing Socialist Party (MSZP) and the Union of Free Democrats (SZDSZ). During the following local elections of the municipalities, the MSZP won first place and the SZDSZ came in second. So in the second governmental period the political setting seems to be more consolidated and favourable for the local self-gover nments as they are not in opposition to the central government any longer. So the policy of the local authorities could be more effective nowadays, as decisions could be easier to put into action. Unfortunately, financial means at a disposal of the local governments are less than in the first governmental period, so as the saying goes "what is made up on the rounds, is lost on the swings". As many social benefits are due to be cut or drastically reduced in 1995, the local (and district) self-governments will face a very grave situation and very little can be done in favour of maintaining public parks and green areas. Other social responsibilities will have precedence.

Sustainable future development

As it has partially been mentioned earlier, the main problems affecting and ruining the green spaces in Budapest are as follows:

1. huge motor traffic emitting NOx;
2. incorrect lifting of building bans in green areas;
3. insufficient amount of newly planted trees;
4. unfavourable urban (technical) structure of the City;
5. still low environmental awareness of the residents;
6. lack of new technologies to increase green spaces.

1. The road network of Budapest is unable to support the amount of motor traffic existing today. The slowly developing ringway around the city will keep out most of the transit traffic in about five years' time. Replacing of the former East-German two-strike motors (constituting almost 20 % of all the cars in Budapest) will also contribute to environmental improvement. The lack of parking spaces in the City may be resolved by building a number of deep parking lots, though these probably will raise groundwater problems on the Pest side of the town. The underground lines ought to be extended with very spacious parking lots built at their terminals. The inner City's traffic bans should also be extended so that only taxis, buses and freight lorries could enter the greater part of the City. In doing so, the worst pollution of the Budapest air could be improved, ensuring better living conditions for the little green there is, and moreover, the people living and working there.
2. The existing green areas of the hilly Buda side are endangered most by residential building, which is in spite of the building bans. With the help of false information and corruption it has always been possible for new residential development to be located in (formerly) green areas. The forest is being pressed higher and higher towards the tops of the hills by the villas. The need of the well to-do to move into the 'healthy' and highly reputed environment with a panorama is so great that there seems to be no remedy against this social process. Like in Athens, many of the once forested hills are doomed to be covered by residential houses during the next 20 years or so.
3. The Mayor's Office of the capital, maintainer of the public parks, is not in the financial condition to have an efficient number of trees planted per year and to take care of the existing parks. The success of their activity though, depends on the financial budget of the government and the national economy.
4. Another major obstacle of the healthy proportion of greenery in Budapest is the technical inner structure of the centre of the town. As much of the territory of old parks and gardens was built up, Budapest has no Hyde Park, Regent's Park or Kensington Gardens in the City. There is no space left for any new park either, and the estates are so expensive in the City that it is much more profitable for a district self-government to sell them, than to convert them into parks.
5. The environmental awareness of Hungarian people had been very low during the decades of communist rule, because publication of environmental research results was discouraged by the Party. Consequently,

the voice of the greens can only be heard in Budapest, and mostly only in Buda where the wealthier with higher educational level live. In recent years, there have been a few demonstrations against intensive motor traffic. There was a weaker protest in the press when they cut down three old oak trees at the Nyugati Railway Station for the sake of a temporary site of the Tent Theatre. But these protests, even including their political supporters, are not strong enough to influence government policy or to represent the interest of local residents.

6. New technologies to spread green surface are very rare to find in Budapest. In districts 1, 5, 6, 7, 10 where there are very few green surfaces, one cannot find the vertical green structure introduced: grass h as covered flat roofs or climbing plants covered walls. Or fountains (built in small bare squares in order to raise air humidity, absorb pollution and induce micro-climatic air circulation, in other words to replace the effect of a green area where there is no place for the trees).

To conclude this study in an optimistic way, however, sustainable condition of the Budapest green areas can be expected, if:

- the transit motor traffic is diverted from the City;
- the environmental awareness of people keeps on growing;
- the vertical green surfaces are introduced in the City.

There is no basic impediment to the above criteria and normal economic growth is sure to bring about each of them in the future which should not be too remote.

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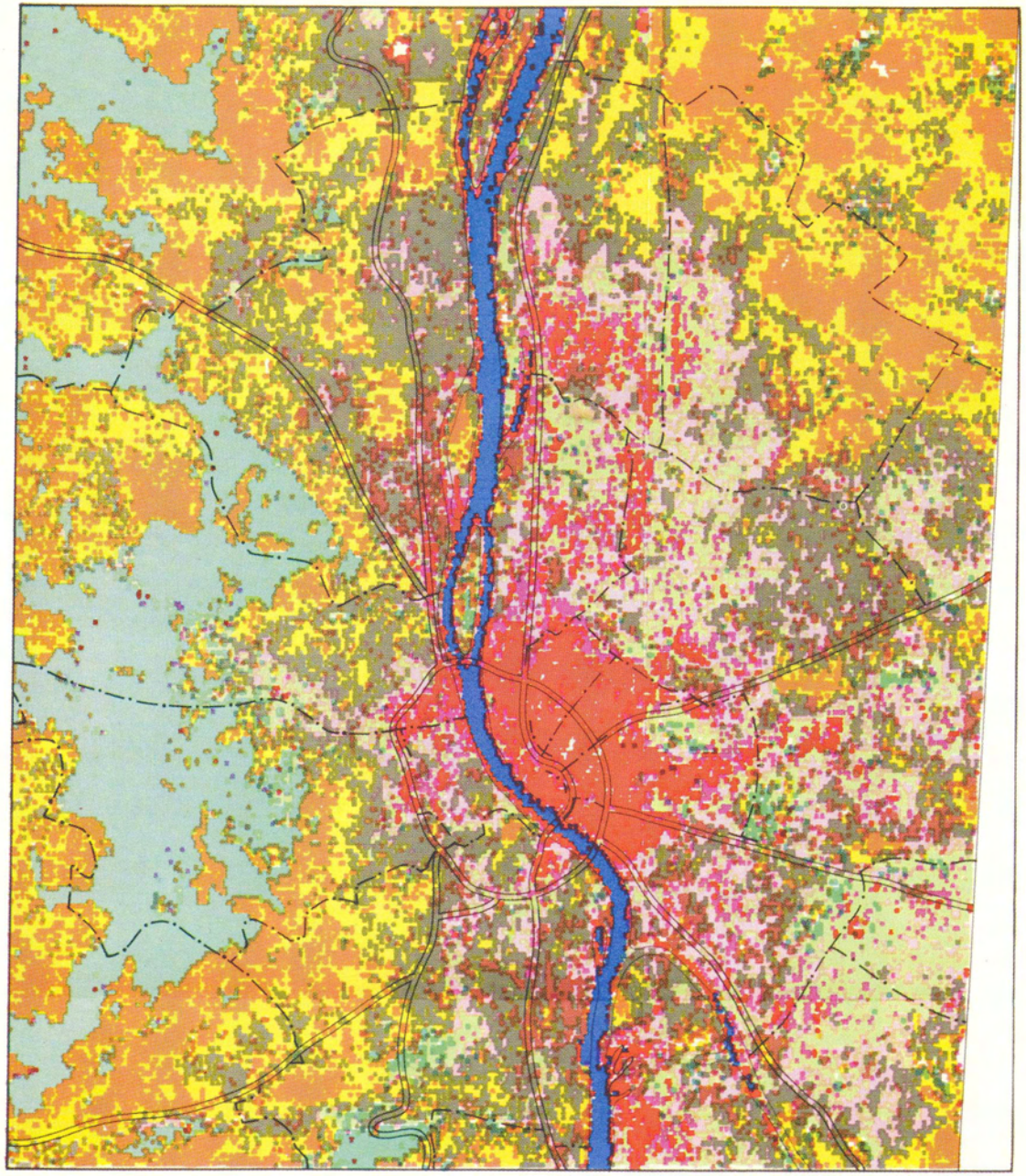

The green areas of Budapest on the basis of LANDSAT digital survey (I.Tósza, Fig. 7).

N

- Water surface
- Commercial and older residential built-up areas
- Transportational and industrial areas
- Modern residential areas
- Garden suburb
- Orchards and/or recreational areas
- Green residential areas
- Forest areas
- Pasture and agricultural areas
- Cropland and barren land
- Unidentified areas
- Main road
- District boundary