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THE MAIN FUNCTION OF PLANT DESIGN OF PARKS AND GARDENS

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ABSTRACT: The parks and gardens, and public open spaces can be used for passive and active recreation. Thus they differ in size, shape - form and function they perform. Strategic approach should be set to assess community needs and to plan an enrichment of the green system network. Environmental characteristics of plants play an essential role in the scale - spatial composition of parks and gardens. The positive impact of plants on air, soil and water is undeniable, and their positive effect on the microclimate is an invaluable asset to an urban environment. The enormous possibilities of the trees and shrubs to protect the architectural buildings and parks space of wind, noise, dust and harmful gases should not be understated. Parks are formed on existing parks, on formed and shaped surfaces as well on completely unformed surfaces. Beside the environmental factors, the parks provide to establish and preserve the natural environment. areas for sports and recreation are planned as part of the parks.

Keywords: park, garden, design, landscape, vegetation.

1 INTRODUCTION

Parks and gardens are available for local residents; generally providing for rest and recreation, but can also provide a sense of identity and place in the community, especially when it incorporates important landscape features or historical feature.

The main theoretical productions in the park art are closely linked with the principles of the general theory of composition. The combination of plant design in greenness planning also obey the principles of unity, expediency, proportion, balance, etc. The specificity of the materials and the extent to which it is the volume-spatial composition of plant, require a special approach in the application of these principles in landscape design.

2 COMBINATION OF ARCHITECTURAL AND PLANT COMPONENTS IN PARKS AND GARDENS

Trees (woody plant species with trunks) and shrubs or shrubbery (relatively short woody stem which gives many branches) are the basic elements of a park area. Grass (herbaceous short stem) and flower surfaces complement the space and increase the effect of the sight and sites.

Environmental (ecological) characteristics of plants play an essential role in volume-spatial composition of parks and gardens. The positive impact of plants on air, soil and water is indisputable, and their positive impact on the microclimate conditions is an invaluable asset in an urban environment. The enormous possibilities of the trees and shrubs to protect the architectural buildings and parks space of wind, noise, dust and harmful gases should not be understated. The design of the parks are actively used and another important feature of the vegetation - aesthetic. This feature is its affordable and comprehensive feature the art park.

The specificity of the design of parks and gardens (design of the park) requires thorough knowledge of the building blocks - ornamental plants. Knowing the morphological, ecological and biological features of plants are of great importance in the design of parks and gardens.

After the determination of the composition of plant skeleton, next step is to begin developing a detailed plan separately for each park space. In this process there is a fundamental point of reporting all morphological,

ecological and biological characteristics of the elements that act, namely plants with high urban ornamental values. Through those characteristics they are built in an area as large arrays of trees, shrubs as well as groups of trees and shrubs, and some accents in open spaces.

In practice, landscape designs are application of specific and numerous ventures, which are used extensively in the solution-space of plant and are closely related to the main compositional principles in art park.

The design of parks and gardens addresses two main issues: the composition of architectural planning paths (avenue network) and volume-spatial composition of plants (vegetation, often urban dendroflora). The first major composition is referred as horizontal elements (sidewalks, water areas, lawns, etc.). In terms of spatial composition the horizontal elements play a decisive role in plant scaling.

Groups of trees, shrubs and arrays, and structured park area of open and closed spaces, are built around the horizontal elements, and thus define the main sights.

The environment has great importance and interconnectedness that creates balance between plant and architectural content in the construction of parks on large areas. The complex nature of this process has emerged an obvious priority plant volume, offering significantly more favorable opportunities in building spaces for recreation in the park as well as in the urban environment.

In modern urban practice plant volumes (Fig. 1) are often used as the primary means of spatial structure on the larger public areas (a1, a2 and a3).

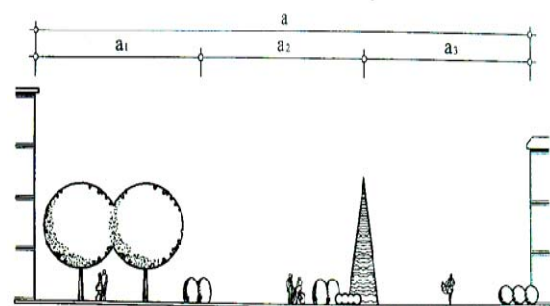


Figure 1: Plant volume as a prime structure of larger space

In spatial arrangement of streets and boulevards crown of trees define the characteristic appearance of the silhouette of the street. Plant volumes (Fig. 2) absorb various architectural styles of the buildings (a) and combine the total scale of their walls (b).

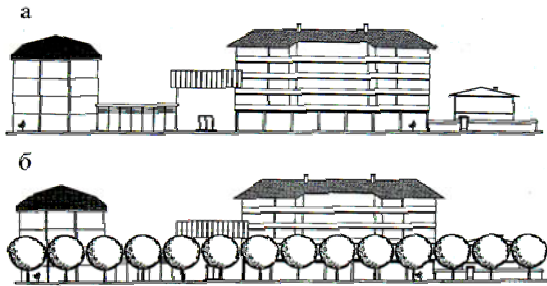


Figure 2: Plant volume as an absorber in urban architectural design

The habitus of the plants, their size, structure and texture of the crowns can define the horizontal and vertical structure of plant composition. Depending on these characteristics and the density of planting (Fig. 3), park spaces can be viewed as (a) open, (b) half-open, (b) semi-closed and (r) closed.

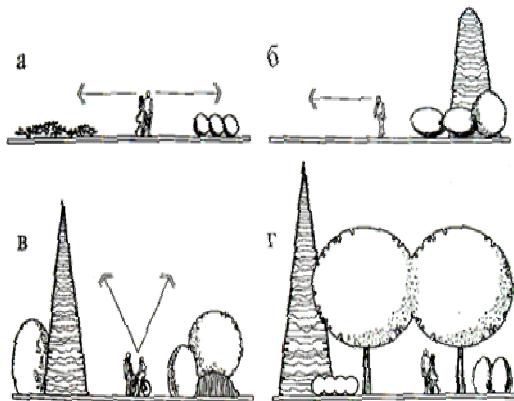


Figure 3: Park spaces in correlation with morphological characteristics of plants and the density of planting

Vegetation (Fig. 4) can visually soften (a) or stress (b) relief forms in park areas.

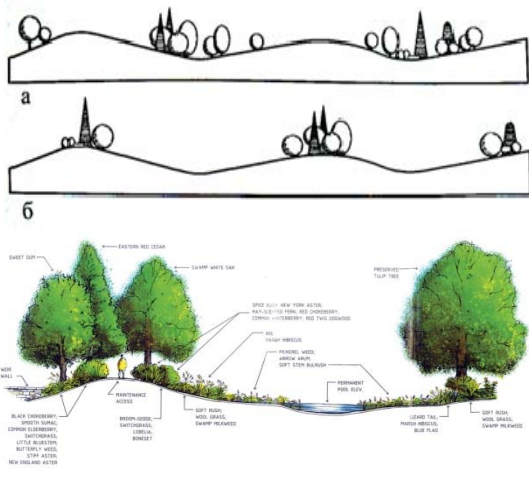


Figure 4: Visual influence of vegetation on relief forms

When composing an ornamental plant in groups of trees and shrubs (Fig. 5), it is recommended shrubs to be planted in chaotic separate small spots (a) and can be deployed and incorporated in compact groups in terms of trees (b).

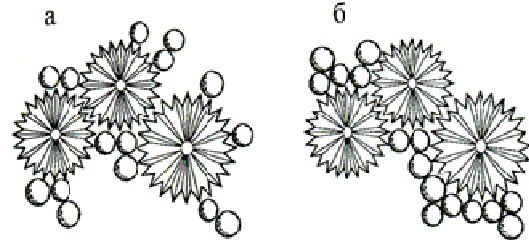


Figure 5: Combination in groups of trees and shrubs

By combining the deciduous and coniferous tree species in decorative groups, should be required of such available conifers which have characteristic of vertical impact and can serve as unifying elements of the composition: needle-leaf trees can both divide and unite the composition (Fig. 6).



Figure 6: Conifer in composition- a combination of group of deciduous broadleaved trees and needle-leaf tree (both unifying and dividing visual element)

If there is a sufficiently close to each other species (Fig. 7; a), it is recommended to unify the scattered plants into a single composition by introducing additional trees or shrubs in the empty spaces in between (b).

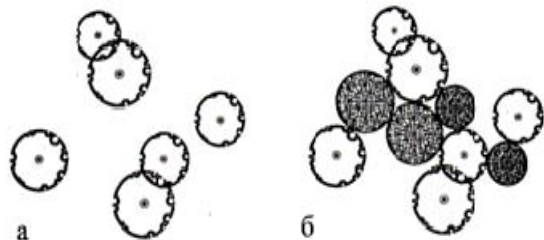


Figure 7: Unifying a composition by planting a number of woody plants in spaces between scattered individual trees or shrubs

When connecting strip of needle-leaf trees with strips of deciduous broadleaved species (Fig. 8) it is recommended not just to plant the species in places of connection (a), but to make two overlapping strips in place of their union (b), while coniferous go behind.

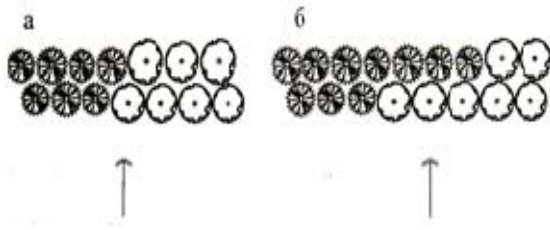


Figure 8: Linkage of deciduous broadleaved and needle-leaf tree species

When creating decorative groups of trees and shrubs, the participation of the understory vegetation should be taken in to consideration i.e. shadow-tolerant species should be placed in the lower levels of the floral composition to avoid heavy mowing parts under the crown of trees (Fig. 9).



Figure 9: Decorative group

When a decorative group consists of a relatively small number of trees- up to seven (Fig. 10), it is better recommended the number of the species to be odd (6), because even number of trees (a) create a sense of tentativeness of the composition.

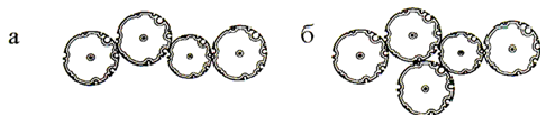


Figure 10: Comparison of even and odd number of trees planted in small groups

The normal perception of a given element of the park (plant group, solitaire, architectural sculpture or volume) is needed to provide the minimum distance from it by $2H$ (twice its height), which provides about 27 degrees vertical angle from the point of observation (Fig. 11).

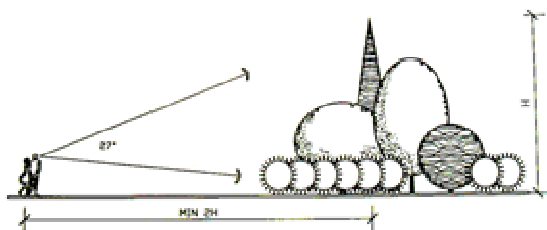


Figure 11: Minimum distance of the object and the bystander is twice as height of the object ($2H$) or about 27 degrees vertical angle from the point of observation

The overall silhouette of groups of trees, shrubs and other plants arrays of different sizes and shapes of crowns/habitus (pyramidal, spherical, oval, umbrella etc.) contributes to more vivid and dynamic form of their contours (Fig. 12).



Figure 12: Various habitus of the species contribute to the overall contours of the composition

The decorative groups of trees and shrubs from one plant species can be dominant in the composition and stand out among the rest either by its size or shape, or ornamental qualities (Fig. 13).



Figure 13: Dominant trees in the composition can have very high ornamental values

Pendulous habitus or weeping forms of creepers and vines can be used to visually reduce the height of retaining walls or other vertical surfaces. This morphological feature of some plants brings aesthetic characteristic of “life” to the monotonous and rough concrete surfaces (Fig. 14).

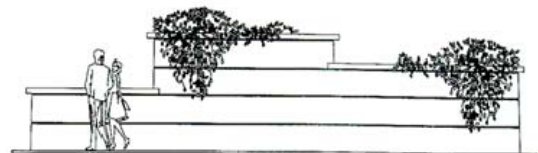


Figure 14: Creepers, vines and pendulous habitus of ornamental plants can visually bring “life” to vertical surfaces

Ornamental plant species with darker foliage (Fig. 15) look optical closer to the observer (a). In reverse - plants with bright colored leaves look far distant (6).

When grouping ornamental plants, it is recommended that the plant with bright color of leaves to be positioned in front of those with darker leaf color (Fig. 16). These configurations depend on the intended point tracking and directly affect the overall perception of the group as a individual plant and compact composition.

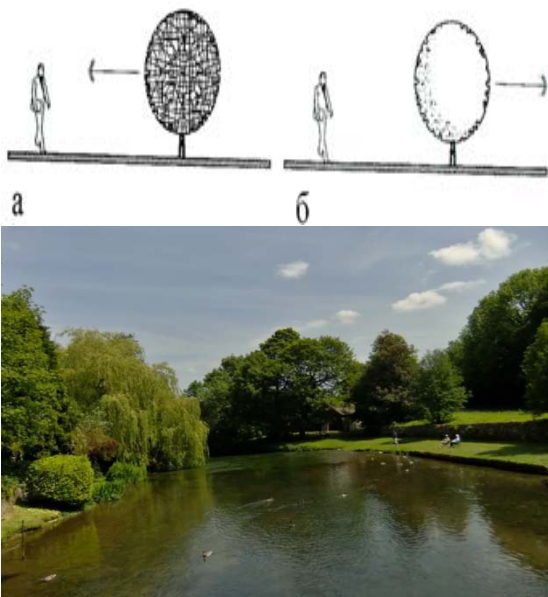


Figure 15: “Optical distance effect” of plants with darken and bright foliage

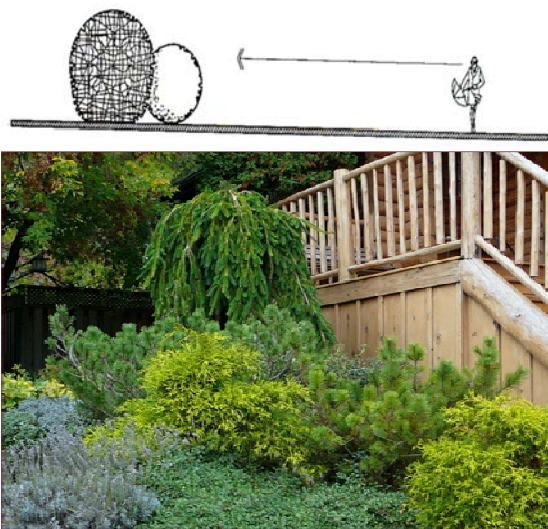


Figure 16: Position of trees and shrubs with bright leaves in front of species with dark foliage

Plants with rough leaf texture visually approach the observer and vice versa - with a smooth texture of the leaves seem distant in space (Fig. 17).

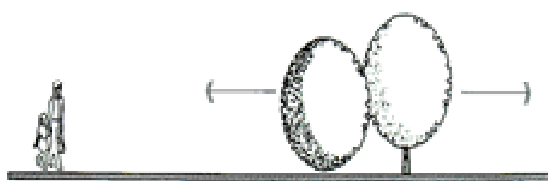


Figure 17: Effects of plants with rough and smooth leaf texture

To ease the strong contrast between the close plants with very bright and very dark leafage it is recommended

to combine them into whole plants using medium or neutral tone of leaf colors (Fig. 18).

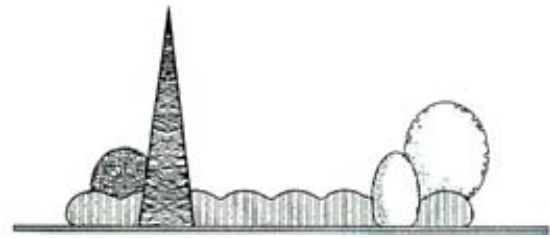


Figure 18: Contrast represented by the leaves of the vegetation

Plant composition with evergreen and deciduous species is interesting for planning because certain morphological characteristics of deciduous trees and shrubs are in particular ornamental during autumn and/or winter season. This composition is highly decorative if the background consists of coniferous and significantly affect the aesthetic value (Fig. 19).



Figure 19: Combination of deciduous (in front) and evergreen species (in background)

When plants with various form crowns are in groups, those with vertically elongated shapes are dominant in the composition (Fig. 20).

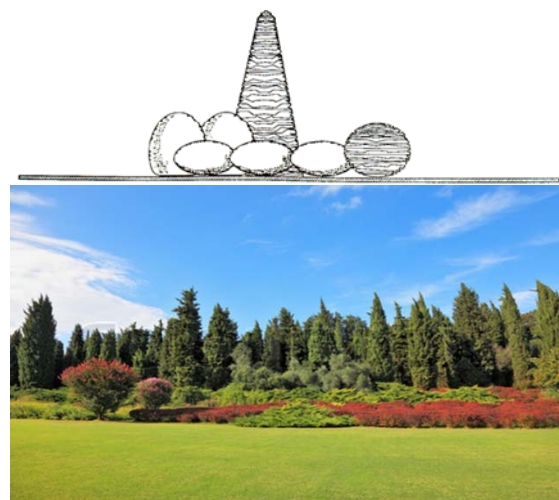


Figure 20: Dominance of elongate/columnar habitus in group combination

In a closed park area (Fig. 21; a) should be kept in mind that parts of borders planted with deciduous trees and shrubs with low density will let unilateral uncovering during autumn and winter (b). This provides seasonal dynamics of the space and uncover other parts of the vegetation and landscape.

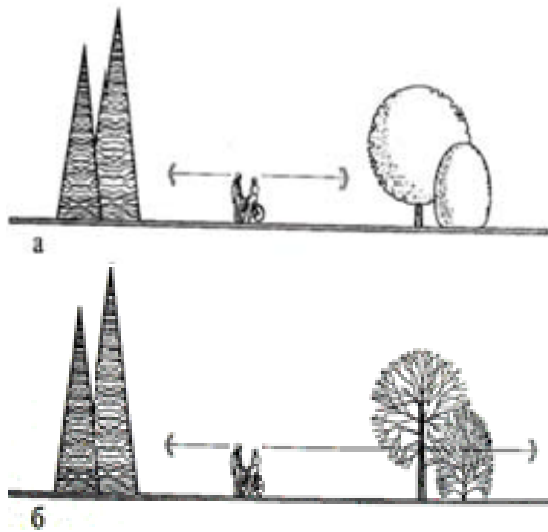


Figure 22: Deciduous trees and shrubs can uncover wide area in closed park composition during winter

It is recommended to plant deciduous broadleaf trees with large crowns on south-west side of the terraces (Fig. 23), playgrounds, recreational corners, etc. in order to prevent insolation from the afternoon sun during the summer months.

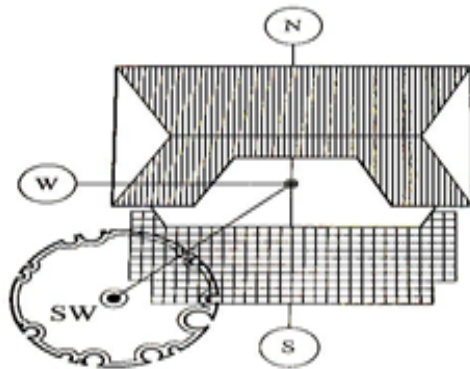


Figure 23: Deciduous broadleaf trees can mitigate insolation from afternoon sun when planted on SW side

In modern urban environment (Fig. 24; a), the use of plants to provide reliable protection of buildings from noise, dust and harmful gases, is of great importance. This can be accomplished by providing so-called transitional spaces between transport and communications entrances of houses (b).

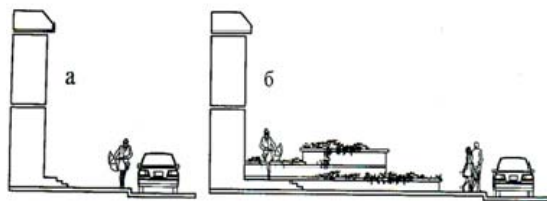


Figure 24: Transitional green spaces- squares, fixed beds with ornamental vegetation, retaining walls

Decorative vegetation can be successfully used for display signs and boards- to attract and focus the eye-catcher from afar (Fig. 25).



Figure 25: Ornamental trees and shrubs as an eye-catcher for signs and boards

Main backdrop for outdoor sculptures are “green walls”- background of densely planted species, sometimes even as hedges (Fig. 26).



Figure 26: “Green walls” of dense plant species make excellent background layer for outdoor sculptures

3 CONCLUSION

The most valuable contribution can be made in the first phase of the project when ideas can be generated along with the technical understanding and the creative flair for design, organization and use of space. The scenic architect should conceive the overall concept and prepare a plan of detailed drawing design and technical specifications. They can also review proposals and authorize and oversee construction. Other skills required are design impact estimates preparation, implementation of environmental auditing estimates, and expert witness requirements for land use issues.

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