LANDSCAPING POTENTIAL OF ROADS IN RURAL AREAS

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Abstract:

Until now, the role of vegetation which accompanies roads in rural areas has been usually understood very narrowly as it has been mainly considered from the point of view of transport. Therefore, this paper aims at defining the role which this accompanying vegetation plays as an integrated part of a complex landscape treatment. The landscaping mission of these vegetation systems may be understood in a much broader context, as they simultaneously fulfil a wide array of functions related to ecology, amelioration, microclimate, society and culture. Country roads play a significant role in opening the landscape to an ever-growing need of movement and traffic. Within our system of road classification, country roads, which include less frequented third-class public roads and local roads, are of extraordinary importance for landscaping. On the basis of practical examples from a rural micro-region, the paper defines sixteen different methodological approaches which may be taken to create a complex and multi-functional system of accompanying vegetation as well as its functional subsystems.

Key Words:

Rural areas, rural settlement, country roads, landscape composition, accompanying vegetation, tree avenues, fruit tree

Introduction:

The main task of landscape architecture is to create rural landscapes while bearing in mind their overall context. Landscape architecture is to promote permanent and multi-functional vegetation systems which are a highly significant component of Czech landscape. Currently, the role of these systems in Czech rural areas has been changing due to a number of economic, technological, ecological, demographic, social and cultural changes. One of the challenges we are facing today consists in the future of the vegetation which grows along country roads – this accompanying vegetation is the most typical but also the most endangered formation of what we call “scattered greenery”. Within our system of road

classification, a special landscaping importance may be attributed to country roads, which are defined as third-class public roads and local roads. Considering the overall road network size on 1 July 2008, third-class public roads accounted for 61% of the total road length of 55 541.07 km, while highways, first-class public roads and second-class public roads accounted for only 2 %, 11 % and 26 % respectively. This paper is thought to be a small contribution to the issue.

Materials and Methods:

Landscaping potential of country roads is mainly determined by their number and their systematic territorial layout, (Wichsová, 2002, Kolektiv, 2007, Hos, Veselý, 1958), less frequent use (Wichsová, 2002), their mainly positive relation to the landscape (Vaníček, 1951, Löw, Míchal 2003, Pospíšil, 1977, Žák, 1947, Říha, 1948), their role in the historical evolution of the landscape (Květ, 2003, Pacáková et al., 1999) and by the development of rural settlements (Slepička, 1981, Sýkora, 1998). Since mid-20th century there has been a growing need for a new and revised approach to a further development of country roads, and consequently also to the role of their accompanying vegetation. This was due to a gradual increase in traffic and due to emerging needs for a complex landscape treatment. (Žák, 1947, Sklenička, 2003, Simons, 1961, Bulíř, Škorpík, 1987, Jellicoe, 1995). With regard to their social role and particularly with regard to the expected development of rural areas, country roads were newly and very inspiringly classified by Wichsová (2002) into the following six functional categories: 1. roads for traffic, 2. service roads for traffic, 3. service roads, 4. quiet roads, 5. agricultural roads 6. non-motor roads. This approach, which bears in mind both transport and social aspects, fully depicts a wide range of possibilities for their complex landscaping utilization.

Throughout history, the role of accompanying vegetation has been understood almost exclusively from the point of view of transport. The accompanying vegetation has been thought to improve conditions for pedestrians and vehicles by providing shade and it has also been seen as a means of their spatial delineation and physical protection (Říha, 1948, Hos, Veselý, 1958). Despite being outdated, this approach is still used today and is even enshrined in the Czech norm on roads and highways planning CSN 73 6101 of 2004, which applies a narrow point of view focused on transport. In the past, the accompanying vegetation was considered in a broader context especially in the baroque period which favoured the creation of tree avenues, often of large dimensions, and these formations were mainly perceived as a composition element of the landscape (Pacáková et al., 1999).

Fruit tree avenues are a traditional and long-established form of accompanying vegetation on Czech territory. As they are numerous and ubiquitous, they significantly determine the pattern of our landscape (Němec, 1955, Rejzek, 1957, Mareček, 2008). Currently, the main problem of these avenues is their rapidly progressing disappearance which is due to a great many causes linked to growing conditions, traffic, hygiene, technology and ecology.

The accompanying vegetation is a topical matter of great concern not only because old tree avenues are dying out, but also because this vegetation is currently understood as an important integrated part of the landscape and as a means of opening the landscape to movement and traffic (Mareček, 2005, Sýkora, 1998). Some interesting examples of this approach are the spectacular utilization of country roads and agricultural farms for tourism in the United Kingdom (www. greenways.gov.uk, 2001), Denmark and Germany, or "scenic roads" in the form of park-like recreational byways in the United States, etc. The concept of an open landscape is highly important for modern development of rural micro-regions (Mareček, 2005, Květ, 2003). Pospíšil (1977) deals with routes of the roads because from the point of view of composition they are the most important factor. Pospíšil defines three forms in which routes relate to the landscape, distinguishing between "roads subordinate to the landscape", "roads emphasizing the landscape" and "roads dominating the landscape". An important function of accompanying vegetation should be its role in maintaining the ecological stability of the landscape, particularly in creating rich "biological infrastructure" of interactive elements (Sklenička, 2003, Löw, Míchal, 2003, Mareček, 2005).

In order to define the term "complex landscape treatment of country roads", the authors of the paper analyzed a model area of Jizera Micro-Region in the region of Liberec (Table 1). The results quoted are provisional and derive from the work carried out between 2005 and 2008.

Table 1

Basic features of Jizera Micro-Region			
General data		**Road type and its accompanying vegetation**	
Total area	5 505.8 ha	First-class roads	10.8 %
Number of inhabitants	4339	Second-class roads	13.7 %
Population density	79.7 people per km^2	Third-class roads	75.5 %

Total number of municipalities	12	Healthy and complete avenues	35 %
Total number of settlements	32	Avenues in decay	51 %
Altitude interval	237 – 419 m asl	Newly planted avenues	4 %
Bioregion	1.4, 1.34, 1.35	Vegetation-free segments	10 %
Proportion of agricultural land	71.3 %	Fruit woody species	2059 pieces, 92 %
Proportion of forest land	18.1 %	Non-fruit woody species	84 pieces, 8 %
		Woody species Class A (woody species in good condition)	5 %
		Woody species Class B	15 %
		Woody species Class C	35 %
		Woody species Class D (woody species in poor condition)	45 %

The project was based on an analysis of current situation and on expected needs of the area. The following methodological approaches and foundations were applied.

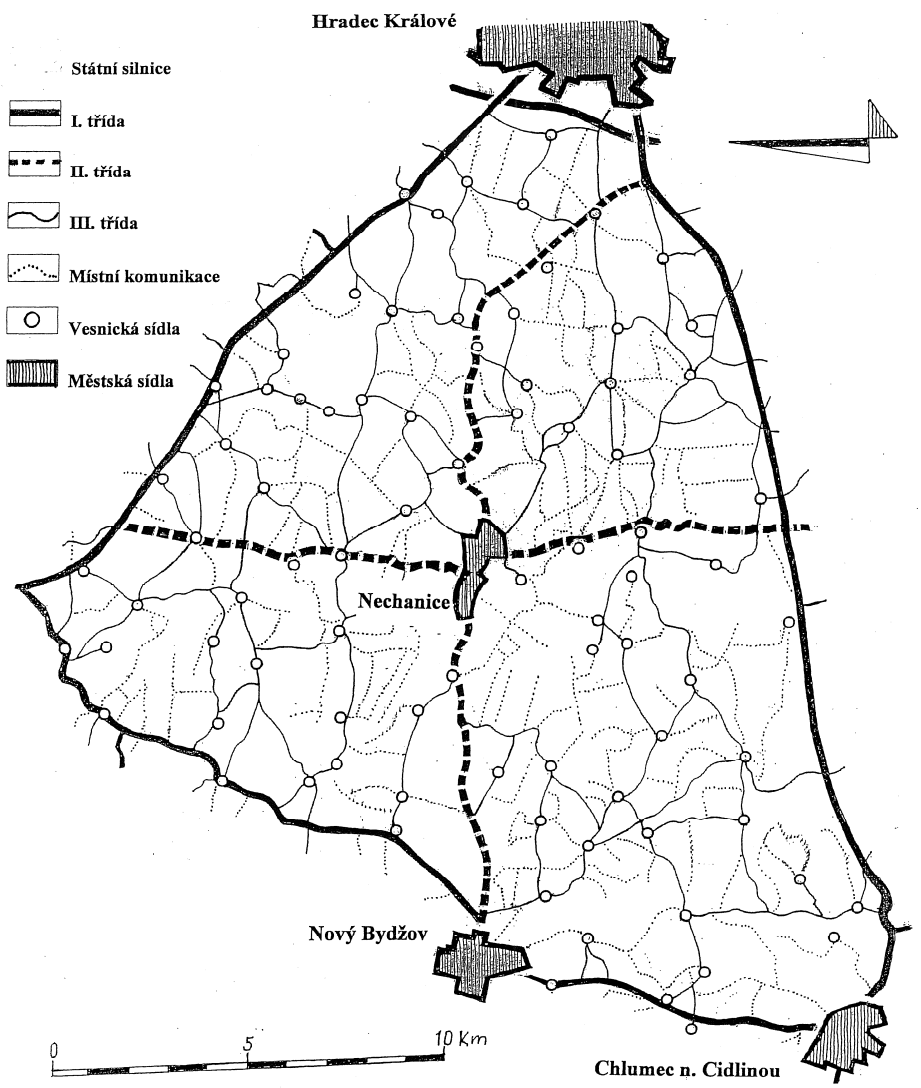
1. The basic landscape-forming function of roads consists in their route which may be complemented, stressed or subdued by accompanying vegetation.
2. The existing accompanying vegetation along the majority of roads is mainly composed of tall fruit trees, the species and cultivars of which reveal a clear orientation on fruit-growing and production.

3. A significant part of the fruit trees are in poor condition due to ill health, advanced age, long-term neglect in terms of care, and due to harmful effects of traffic and agriculture.
4. The current and future state of this vegetation is a matter of deep concern for a number of civic initiatives which pinpoint the role of these trees in a broader context and stress mainly their functions related to ecology, culture and society.
5. In case of almost all evaluated roads, the accompanying vegetation is considered narrowly from the point of view of transport, and the executive and control authorities responsible for transport in the individual administrative units lack any official conception for its future development.
6. There is a need for preparing a prospective conception of accompanying vegetation which would consider a broader context and landscaping potential. This conception could serve as a basis for a complex landscaping policy.

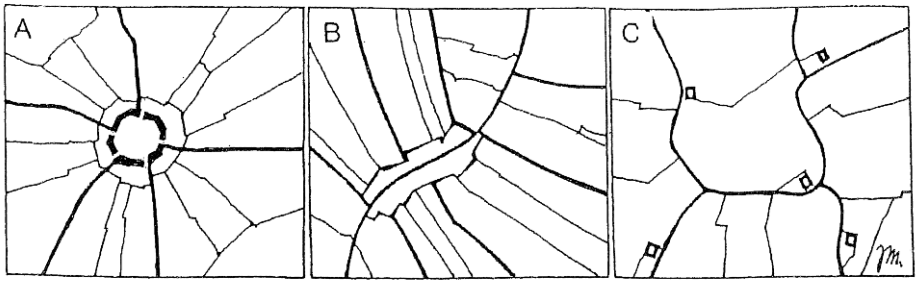
Results and Discussion:

By processing data from the project the authors identified 16 methodological approaches to creating multi-functional systems of accompanying vegetation, and these approches may be considered valid not only on the area covered by the project, but may also be applied generally in other similar areas.

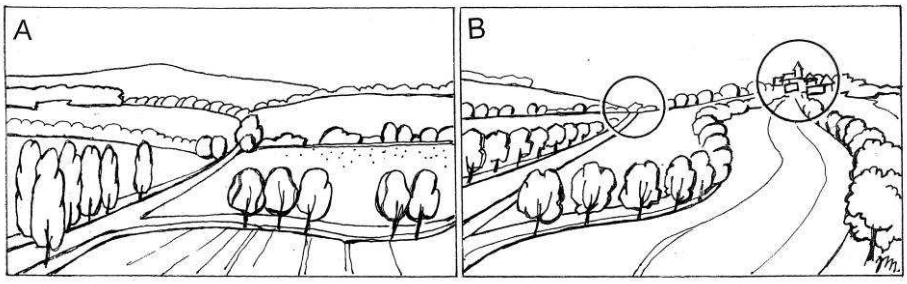
1. High density and spatial layout of country roads may be used to create a basic system of permament vegetation treatments. Unlike first and second-class roads which tend to be but running lines in the composition of the landscape, country roads cover very wide and spatially continuous areas, and therefore, they have a different relation to rural settlements and landscape details. Therefore, the system of country roads gives rise to zones with ideal conditions for a specific type of new landscape treatments.



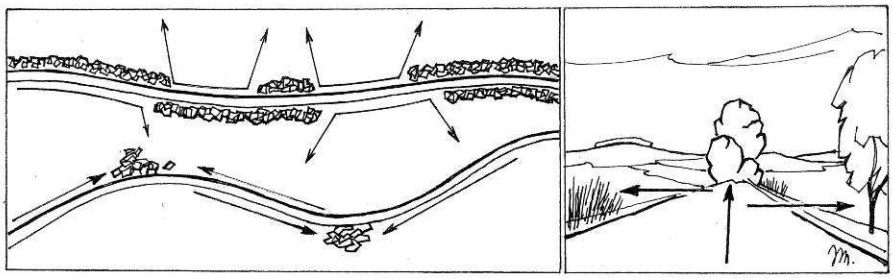
2. <u>The routes of country paths and roads may be preserved, renewed or given a modern interpretation.</u> Their ground plan and orientation are the most important historical evidence of the first anthropogenic impacts on the landscape, they express spatial and functional relations between settlements and the landscape, and they are also linked to the ground plan of villages and to original systems of land ownership. Therefore, country paths and roads are a basic key which opens the historical identity of a territory. (A) village with a circus in the centre and plots of land organized into a star (B) street organization of a village with markedly parallel crofts (C) farmstead organization of a village with segmental land ownership. The routes of paths and roads were designed so as to enable access to the original plots of land.



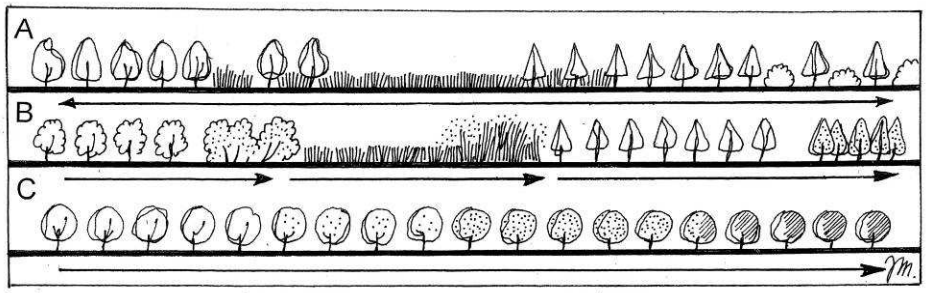
3. <u>The composition of both existing and newly created paths and roads, as well as the composition of relevant limits of plots may be expressed by a changeable system of accompanying vegetation.</u> This may give rise to a new spatial (scale) division of the landscape (A) and to a system of "points of special interest" (B) which are places of a particular value from the point of view of composition. The refined lines of country roads and of relevant plots of land which are differentiated according to specific interests are a basic phenomenon of landscaping practice in Czech rural areas.



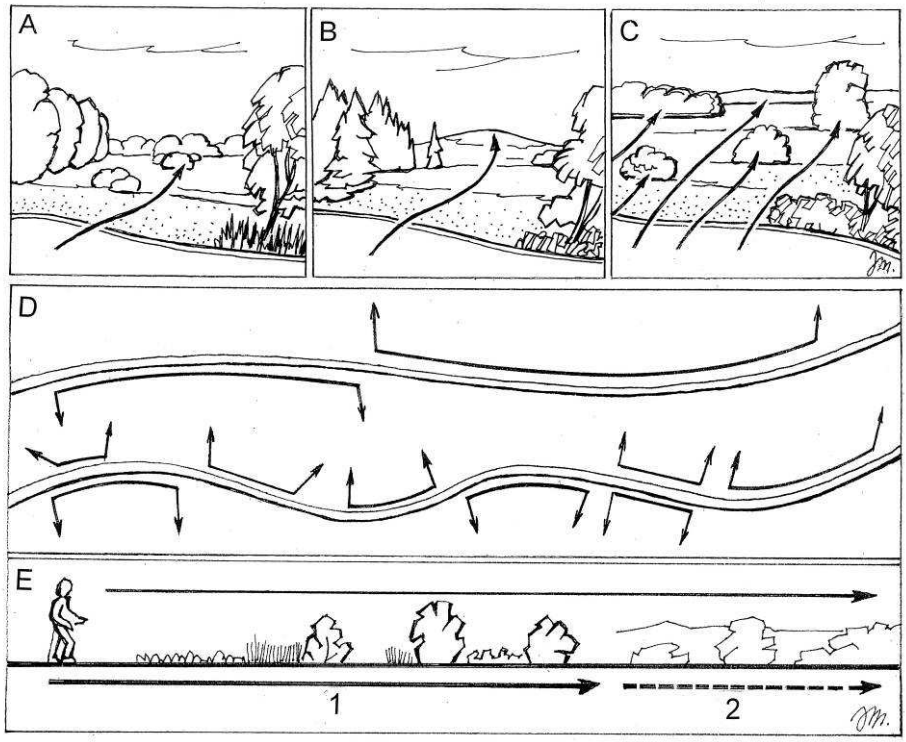
4. <u>Roads may be utilized as basic lookout posts for observing proposed landscape compositions.</u> The perception of landscape is determined by the route of the road, by the type of its accompanying vegetation and by the duration of an open view. By programming these factors, we may affect how the landscape and its contents will be perceived. Apart from panoramas along the sides, we can design views which will open in the direction of our way. For this purpose we can make use of external curves that are very typical for country roads. By closing the views which open in the direction of the road and on its external curve we also remove an undesired "view into nowhere".



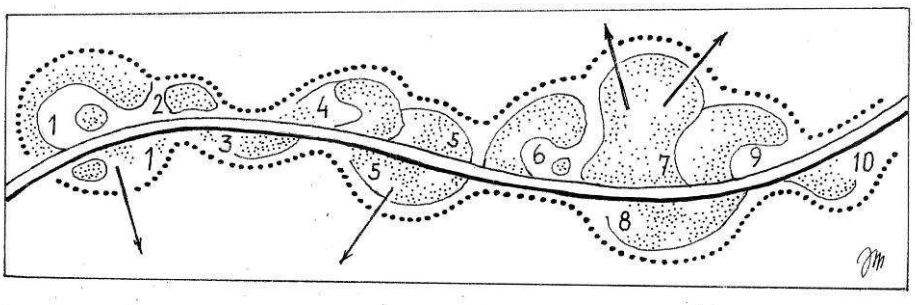
5. Landscape treatments along roads should be series of thematic units which follow one another and intensify the impressions of viewers. While creating these series, a great deal of importance must be given to the accompanying vegetation which is their key element. Gradation may be achieved by interweaving different themes into a gradual sequence (A), or by intensifying the impressions within each of the individual thematic units (B). A very harmonic form of strengthening impressions is a continuous gradation where there are no striking changes in the composition (C).



6. The whole conception of landscape treatments along roads may not be considered separately from the external landscape which will be simultaneously perceived by the viewer. Landscape compositions can be classified as “closed” (A), “partly closed” (B) and “open” or “see-through” (C). The breadth of the composition will depend on the speed of the moving object (D). Spatial depth (E) will be determined by an “operating area”, which will be subject to clearly visible landscape treatments (1), and by a “borrowed area (2), which will be optically incorporated into the composition without any active landscape treatment. In normal landscape, operating areas (1) should be sufficiently wide so as to allow that all real landscape treatments, such as trees, groups of shrubs, crops or division of land plots, be clearly visible. Their width should usually oscillate between 200 and 250 metres.

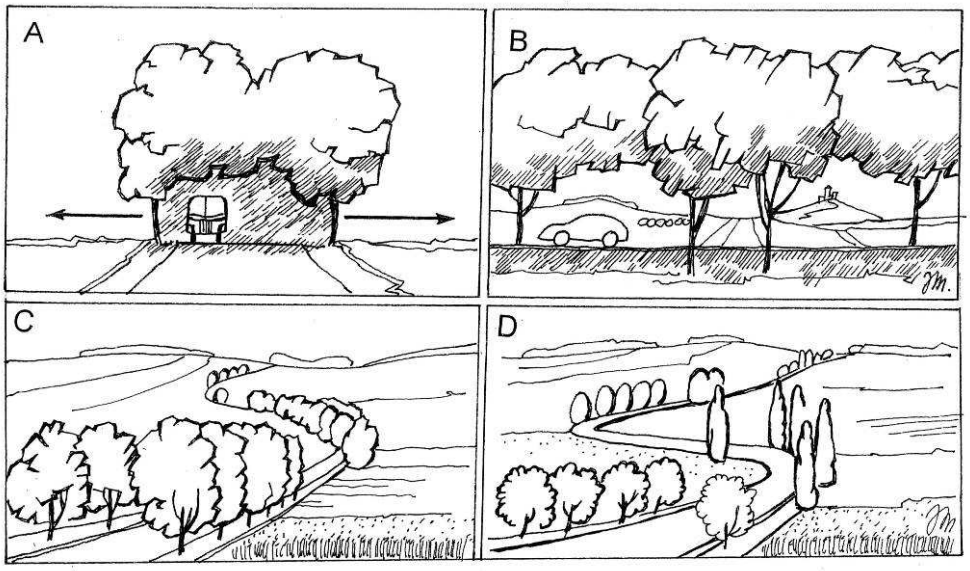


7. A group of small basic road compositions form a bigger composition of a higher degree. As a part of the landscape plan, the bigger composition should include fixed parameters in terms of how its area will be used, and these parameters should be binding for all related levels of urban planning and for agricultural development programmes (urban planning, land treatment, revitalisation programmes, etc.). Practical solutions of these optically delineated sites should be directly proportional both to their frequency of use and to the role which these sites play in the society. (1 – 10) - a set of partial compositions (thematic units).

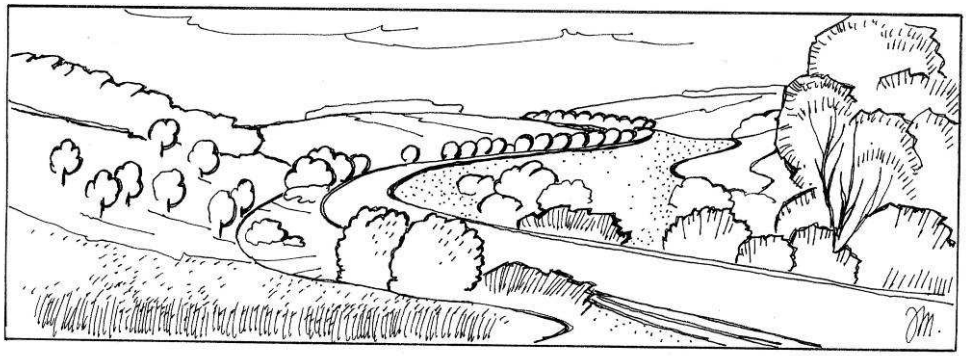


8. The conception of landscape treatments should work with the principle of contrast which is a very typical element used in compositions. Apart from bringing aesthetic values into the composition, contrast is also an important element of safety as it

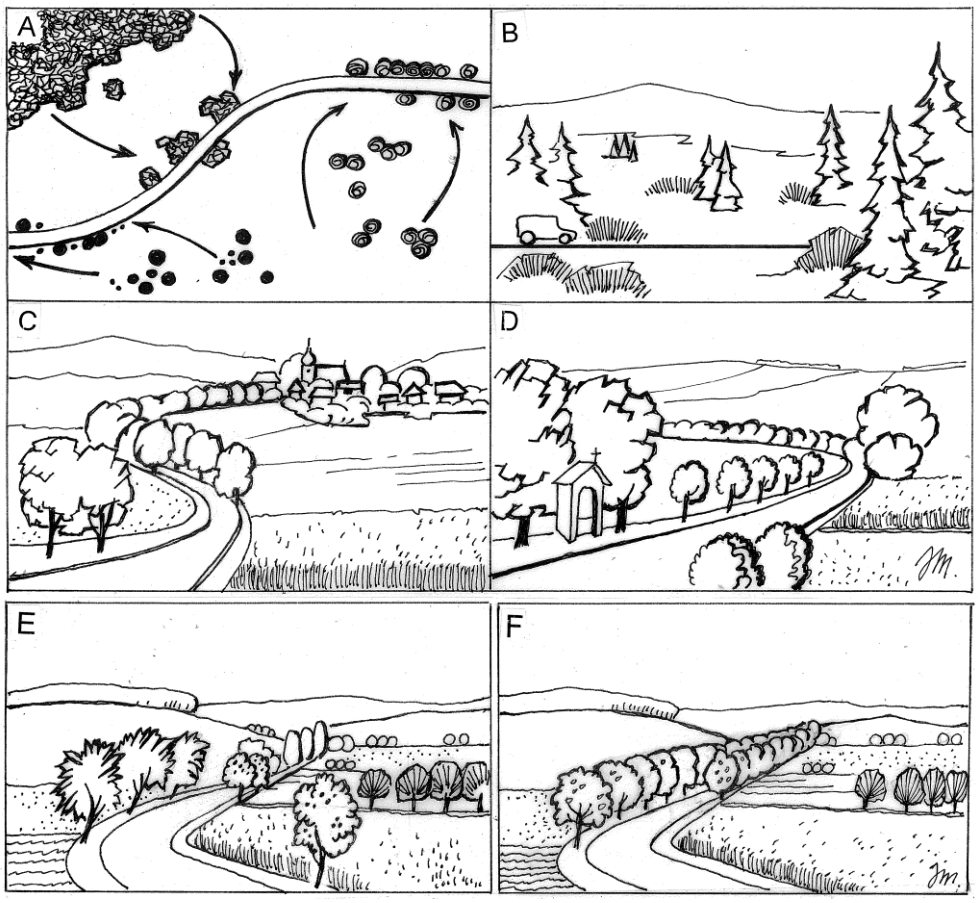
breaks sense of monotony. Contrast may affect our perception and may be expressed in a number of ways: (A) perception of a bigger space from inside a smaller space (B) simultaneous perception of natural details and a wider whole, (C) contrast between fully closed “tree interiors” and open space, (D) use of contrast in terms of different vegetation elements and their shape and colour.



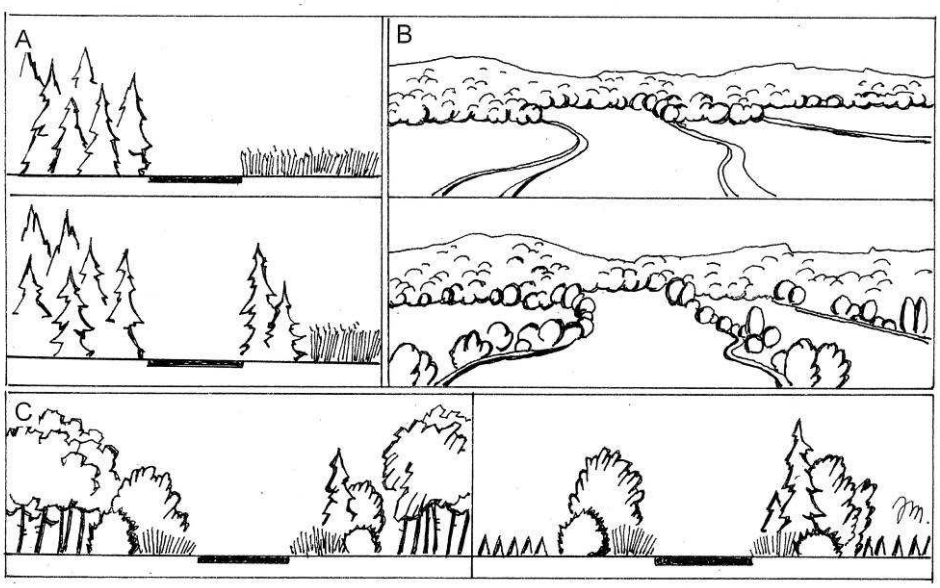
9. The basic composition principle in landscaping should be elegance expressed by harmony and scale. The role of this principle in Czech landscape may be compared to the role of melody and rhytm in the perception of Antonín Dvořák` s work both in Czech lands and abroad. The essence of harmony consists in repetition and change, whereby the change must not exceed the basic values of the repeated element. Harmony may be achieved by designing the route of a road in tune with other lines in the surrounding landscape, and by using similar plant species both in the landscape and along the road. Scale refers to the size of the vegetation system as compared to the spatial segmentation of the terrain and to other related elements of the landscape. An important precondition for harmony and adequate scale rests in the conservation of spontaneous routes and in respecting the number of country roads.



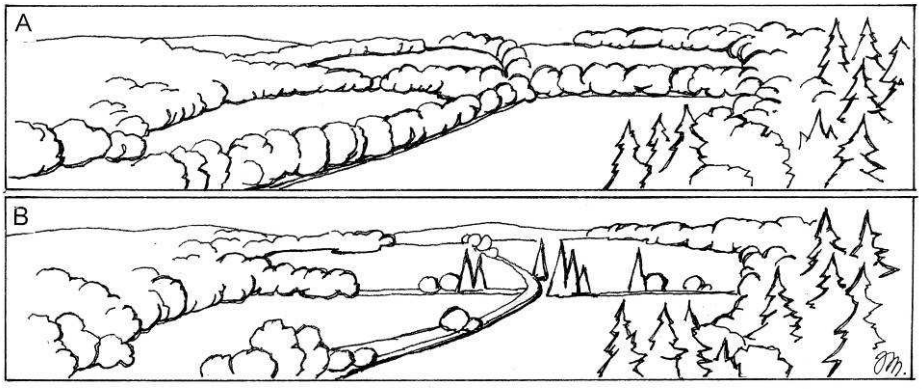
10. <u>The composition of landscape along country roads should express a certain degree of unity between content and form.</u> (A, B) The content, understood as an intention to smoothly incorporate the road into the surrounding landscape, is in accord with the form of the composition, which is expressed by a repetitive distribution and by the use of similar plant species in the landscape and along the road. (C) The content, understood as an intention to create a symbolic and "historical" access road to a village with a great many baroque features, is expressed in the form of a glorious chestnut tree avenue. (D) The content, understood as an emphasis on a piece of folk architecture, is expressed in one of the typical forms of folk landscaping – by symmetry and by use of plants which are different from the surrounding vegetation. (E) Irregular fruit tree avenue which was formed from trees that had been planted individually on the borders of plots that used to belong to different landlords. Its form – irregularity and diversity of species – is in tune with its content, which is given by the needs of individual farmers who were working on the surrounding fields. (F) The form, a monocultural and clearly production-oriented fruit tree avenue controlled by a distant subject, is not in accord with its content as it does not respond to the needs of individual farmers. The relation between content and form may frequently give rise to totally different types of composition.



11. <u>The accompanying vegetation may intensify landscaping value of nearby growing woodlands.</u> (A) In order to soften a common “sharp border” between a forest and open landscape, we may design small groups of forest trees on the opposite side of the road. (B) Unnatural border between forests and agricultural fields may be softened by introducing selected forest elements along the connecting roads. (C) Thematic strip of permanent vegetation may continuously fulfil functions in terms of composition and ecology, regardless of how the forest is used.

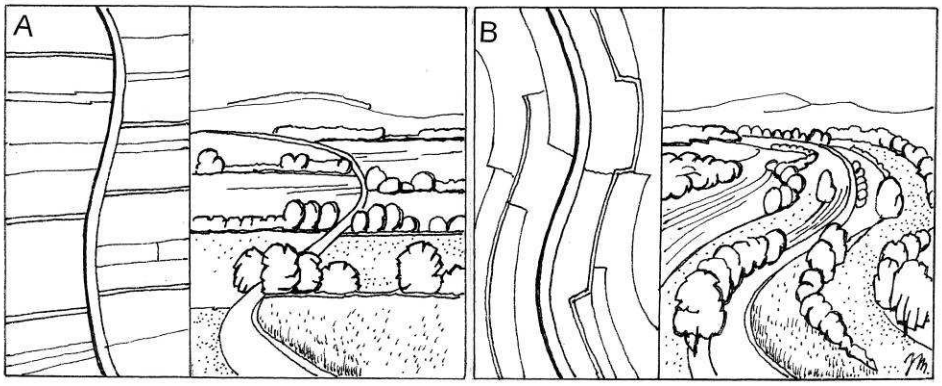


12. <u>The route of the road and its accompanying vegetation should respect, complete and enrich the spatial organization of the area.</u> (A) The area is unnaturally divided by sharp lines of roads and by compact, monocultural and striking avenues. (B) A more appropriate solution respects the spatial frame in question and suppresses the unfitting choice of road routes. In this case, free spaces without any plants may be a positive landscaping solution.

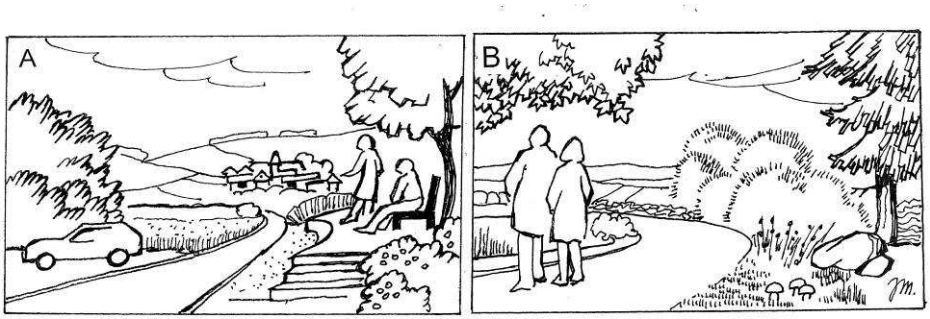


13. <u>From the point of view of composition, the relation between roads and the surrounding landscape is significantly determined by the spatial layout of the connecting roads and paths and by the system of land ownership.</u> (A) When the routes of roads are perpendicular, there is a great deal of space for a more frequent use of contrast and for a gradual intensification of impressions (vegetation, spatial scale and distribution of cultivated crops may all gradually

change). (B) On the other hand, when the routes of roads run parallel one to another, there are ideal conditions for a continuous intensification of impressions.

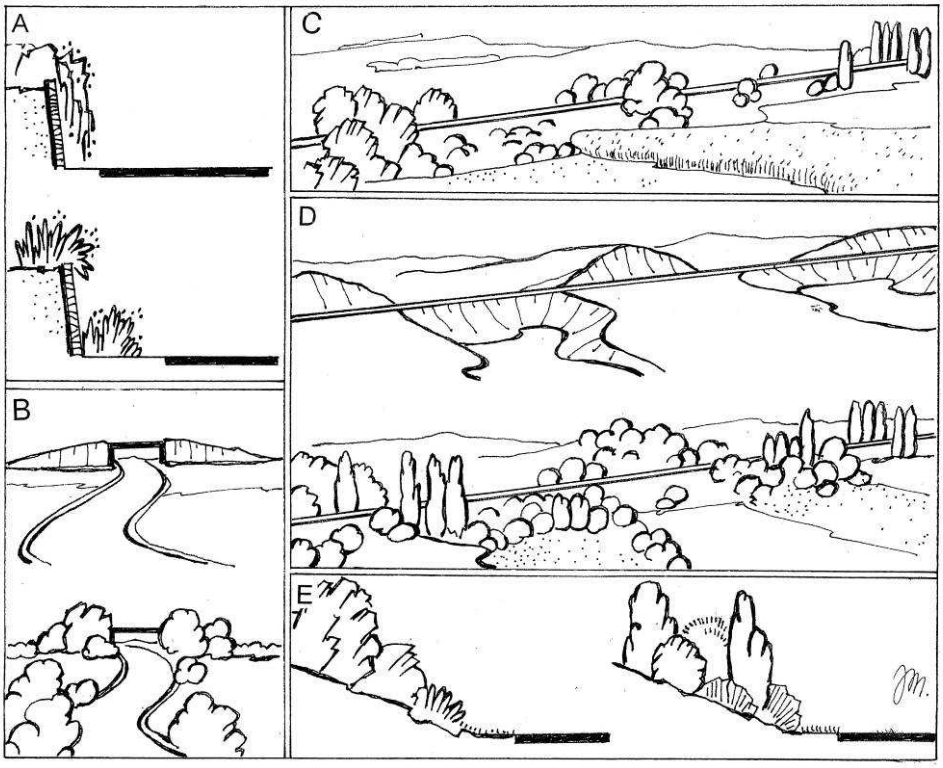


14. Country roads may have a very high recreational potential, which is given by their less frequent use, their connection to a number of rural settlements, their spontaneous routes and by favourable conditions for trees and shrubs and for the conservation of a great many original natural, technical and vegetation elements. This new function should be encouraged not only locally by means of vegetation elements, but also by systems of parking areas and resting places (A) and by promotion of "quiet roads" (Wichsová, 2002) which open the landscape to pedestrians and hikers (B).



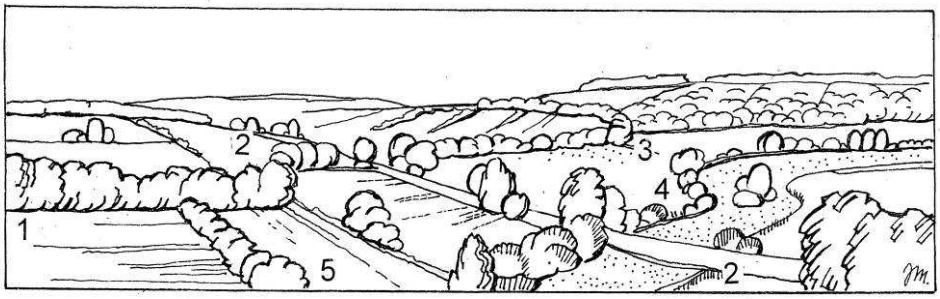
15. Vegetation treatments may play a very important role as they can remedy many unfitting technical measures which have their origin in the construction of roads. (A) Depending on their character, supporting walls may be either hidden or emphasized by trees or shrubs. (B) Overpasses complemented with vegetation not only on the slopes of the embankments, but also in the broader space which surrounds them may be a prominent landmark of a new thematic unit. (C) A route which is too linear may be incorporated into the surrounding landscape by a series

of contrasting transverse strips of vegetation. (D) Large-scale modifications of the terrain which are required for the construction of roads in areas with broken surface may serve as a basis for a spatially segmented system of vegetation which will reflect the rich and varied surface of the surrounding landscape. (E) Indented slopes provide a unique opportunity for creating bigger tree and shrubs formations which will look very natural and will be a remarkable change on a route where there are only limited possibilities for the introduction of any accompanying vegetation.



16. In order to be considered appropriate, landscape treatments of country roads must be an integrated part of a whole and complex landscape plan. While fulfilling its functions in traffic, the accompanying vegetation may simultaneously meet a great many other non-traffic functions. (1) a solemn two-row avenue leading towards a nearby village, (2) a road with irregularly planted trees is the centre of the composition, serves as a lookout and respects the rich and varied spatial layout of the surrounding landscape, (3) accompanying vegetation along a local road which simultaneously serves as a strip for absorbtion and amelioration, (4)

accompanying vegetation along a local road designed as a biocorridor, (5) a local road with a strip of shrubs which serves as a fence of a plot.



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Krajinářský potenciál venkovských komunikací

Funkce vegetačního doprovodu komunikací je až doposud nejčastěji chápána v úzce rezortním smyslu, to je pouze z hlediska dopravního a donedávna i produkčního – ovocnářského. V návaznosti na soudobé programy rozvoje venkova je cílem práce definování úlohy tohoto doprovodného systému vegetace jako integrované součásti krajinného plánu. Širší krajinářské poslání těchto vegetačních soustav by mělo spočívat v souběžném plnění funkcí ekologických, melioračních, mikroklimatických a kulturně společenských. Stále významnější úlohu získávají komunikace při realizaci občanské, krajinné průchodnosti. V dopravně diferencované soustavě komunikací mají v tomto smyslu mimořádnou úlohu tzv. „venkovské komunikace“, to je státní silnice III. třídy a místní komunikace. Tuto širší, krajinářskou funkci mohou plnit svojí početností, krajině blízkým prostorovým uspořádáním, typickou územní vazbou na venkovské osídlení a příznivějšími podmínkami pro tvůrčí uplatnění vegetačních prvků a jejich tématických soustav.

Na základě praktického krajinářského řešení venkovského mikroregionu Jizera u Turnova bylo definováno celkem šestnáct metodických přístupů k tvorbě komplexně chápané, polyfunkční soustavy doprovodných vegetačních prvků, které lze zobecnit následovně:

1. Výrazná početnost venkovských komunikací vytváří prostorově souvislé celky – zóny, s mimořádnými předpoklady a možnostmi jejich krajinářského využití.
2. Prostorové uspořádání (trasování) těchto komunikací vyjadřuje funkční vztah venkovských sídel ke krajině a mělo by proto být nejen respektováno, ale i nově tvůrčím způsobem rozvíjeno.
3. Významným krajinářským fenoménem komunikací je jejich tradiční vegetační doprovod, jehož funkčnost je historicky proměnlivá. Jeho soudobým základním rysem by měla být výrazná polyfunkčnost.
4. Venkovské komunikace jsou základními vyhlídkovými místy – trasami, z nichž musí vycházet základní kompoziční uspořádání krajiny a její programované vnímání.
5. Výraznými kompozičními principy krajinářského řešení komunikací jsou krajinné měřítko, dojmová gradace, obsah a forma, genius loci a dynamika kontrastu a souladu.

6. V soudobém programu rozvoje venkova se zintenzivňují sociální a obytné funkce venkovských komunikací, což se podstatně odráží i ve formách jejich vegetačního doprovodu.
7. Krajinářská úprava venkovských komunikací ve formě polyfunkčního systému doprovodné vegetace je neoddělitelnou součástí komplexně pojatého krajinného plánu.

Photodocumentation:

1. Based on historical evidence, accompanying vegetation has been traditionally composed of mainly fruit trees, however, today this type of vegetation remains preserved almost exclusively along roads in rural areas. Spatial scale and a direct contact with fruits are some of the typical features of Czech landscape.

2. Slow disappearance of fruit trees along roads is caused by a number of factors related to agriculture and traffic. Thus this landscape gradually looses some of its original distinctive character which often remains expressed only by small works of folk or religious architecture.

3. Roads provide a highly important space for the perception of the surrounding landscape, or, in other words, they are an important element in creating a landscape composition. Traditional avenues which may be compared to a “gallery of framed pictures” are a typical feature of Czech landscape.

4. In a dense network of country roads, the accompanying vegetation and its species diversity play a key role in creating what we call spatial division and scale of the landscape.

5. Foundation of large interconnected fields leads to a disappearance of local roads and of their accompanying vegetation. With its size, the remaining fruit tree compositions do not fit into the newly formed landscape and its spatial context.

6. Most non-fruit tree species can grow into monumental “sanctuaries” which are impressive not only from inside, but also from outside as their magnificence dominates the whole of the outer landscape.

7. Roads which are accompanied by no vegetation seem to be empty and without any direction. They sharply break the whole context of the landscape. The road and the landscape are two separate and distant elements which lie one next to the other but lack any connecting link.

8. Since local roads usually end in a particular village, they always have a certain representative role. Therefore, the accompanying vegetation should express the spirit and the peculiar character of the village. Unfortunately, in many places this is not the case.

Note: Photodocumentation from the model area of Jizera Micro-Region.