
ACOUSTIC ECOLOGY – A CASE STUDY OF THE SOUNDSCAPE OF LORETA SQUARE IN PRAGUE

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Abstract:

This diploma thesis is based on key theoretical concepts of acoustic ecology and soundscape and is divided into two main parts. In first part of the thesis I discussed three main approaches to research of subjective perception and interpretation of everyday sound environment: the ecological approach of WSP, Truax's acoustic communication approach, and the structural approach of Augoyard and Amphoux of the CRESSON research institute. Concerning each approach I discussed the basic terms and method (or methods) used for soundscape research. In the second part of the thesis I described each phase and made an analysis of the results of the field research of the soundscape of Loreta Square in Prague. The research was done with questionnaires, and two main approaches were used: one place-oriented approach (subjective perception and interpretation of the everyday soundscape of all of Loreta Square) and one sound-oriented approach (subjective perception and interpretation of the sound of the Loreta Carillon). In the following text I will focus on the historical background of acoustic ecology and on the results of field research.

Keywords: *acoustic ecology, soundscape, Raymond Murray Schafer, acoustic communication, Barry Truax, CRESSON, Loreta Square, Loreta Carillon*

The number, quality and character of the sounds we meet in our environment are constantly changing. Some of the sounds disappear with the passage of time, never to return. Others last for centuries. Completely new sounds appear.

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As a rule, people begin to take notice of the sounds around them when they are forced to face noise problems. Havránek, author of one of the most important books dealing with noise (Havránek 1990), however, is well aware of its specific character when, for example, in connection with musical noise, he states the following: “Musical noise is only partially a health problem. The bigger part is a sociocultural question.” (Havránek 1997: 169) By this, he indicates that, for us to understand the role and function of sound in a human environment better, we must apply a broader theory or approach that would define it more precisely. Therefore, it is important to ask much deeper questions than only about the intensity of sound: How does sound function in a human environment? With which methods can one research human sound environment? On the basis of ascertained realities, how can its quality be preserved and improved?

Not only these, but many other questions connected with noise problems have arisen with the creation of the new multidisciplinary field of **acoustic ecology**.² This was defined as “... the study of the effects of the acoustic environment or soundscape on the physical responses or behavioral characteristics of creatures living within it.” (Schafer 1994: 271) The very beginning of acoustic ecology is connected with the activity of research of the World Soundscape Project (henceforth called WSP) group, which was founded by Raymond Murray Schafer³ in 1970 at Simon Fraser University (henceforth called SFU) in Vancouver, British Columbia, Canada, and the group worked together until Schafer’s departure from SFU in 1975. The basis of the WSP concept became the multidisciplinary, subjective perception of the sound environment, educational activity and the musicality which was attributed to the sound environment. The inspiration for the founding of the WSP was, for Schafer, the artistic Bauhaus movement, which combined crafts and the fine arts and gave rise to the new discipline of industrial design. Similarly, Schafer originally endeavored to unite the disciplines concerned with sound: on one hand, those dealing with sound from the scientific angle and, on the other, those having to do with the artistic angle. Even though this was never accomplished, the main goal of the WSP – the combining of research on the technical, sociological and aesthetic

² In specialized literature the terms *ecoacoustics*, *environmental acoustics*, *soundscape ecology*, *ecology of sound* and *sound ecology* are also used as a synonym for acoustic ecology.

³ Raymond Murray Schafer (born 1933), Canadian composer, musician, soundscape researcher, founder of acoustic ecology. His key publication is the book *The Tuning of the World* (1977), in which he summarizes basic theoretical viewpoints and notes accrued from field research.

aspects of the sound environment – managed to be accomplished within the framework of soundscape studies.

The WSP approach to sound in the human environment was specific mainly in two respects. On one hand, instead of a negative approach which considers sound in the environment only as “noise pollution”, the group applied an approach centered on positive aspects of the sound environment. The other aspect was the substitution of sound research in laboratory conditions by research *in situ*, thus field research in real human living environments. At the beginning of their activity, the group had already defined five concrete goals: (1) to undertake an intensive interdisciplinary study of contrasting acoustic environments and their effects on man, (2) to suggest ways of changing and improving acoustic environments, (3) to educate students and field workers in acoustic ecology, (4) to educate the general public in acoustic ecology and (5) to prepare reports as guides to future studies.

The key term of acoustic ecology is **soundscape**.⁴ Schafer (1994) defined this term in two ways: on one hand, from the practical angle, that is, as “any acoustic field of study” (Schafer 1994: 7) and/or “technically, any portion of the sonic environment regarded as a field of study” (ibid.: 274), and, on the other hand, from the aesthetic angle because, according to him, “... the soundscape is no accidental by-product of society; rather it is a deliberate construction by its creators, a composition which may be as much distinguished for its beauty as for its ugliness.” (ibid.: 237) Franěk (2003) states more specifically that this term “(1) includes acoustic phenomena that we can actively hear, record, measure, and compare; (2) at the same time, it is a community’s aural heritage, which is important for a feeling of comfort and for a sense of the importance of a given place; (3) soundscape is necessary to view as a part of a broader socio-ecological context (it solves the question of the extent to which soundscape is a by-product of social, political and economic structures).” Franěk also adds that “research work of ecological acousticians rests on the recognition and registration of the acoustic characteristics of a certain environment. It is therefore not only a question of measuring the noise level, but also of the identification of the character of various sounds and their value from the point of view of the people who live in a given environment. Various environments or regions are namely defined by having somewhat different acoustic environments – each

⁴ For the area of acoustic ecology that is dealt with in the study of sound environment, the terms *soundscape studies* and/or *soundscape research* are used.

contains sounds that reflect the kind of homelike, dialectic, industrial and agricultural process and natural environment of the place (insects, birds, water, etc.) Apart from specific sounds, in every environment there is something that is common to a certain region or to a greater geographic area.” (Franěk 2005: 197) As far as methods are concerned, these were worked out during three key field studies carried out in the first half of the 1970s.⁵ During the field studies the group applied five research methods: (a) research of spatial distribution of sound in the environment, (b) research of time distribution of sound in the environment (c) research of legislation and noise by-laws, (d) research of people’s subjective reactions on the various types of sounds and (e) recordings of concrete soundscapes.

The core of Schafer’s theoretical contribution is the concept of **features of the soundscape**. The basis of this concept, which Schafer and WSP use for all of their field research on naming specific sounds in the concrete living environment, is a concept of figure-background taken from Gestalt psychology. Schafer and WSP distinguish three prominent types of sounds in a living environment. The first of them is *keynote*. Keynote is a term taken from music, where it denotes the tonality of the composition in question.⁶ As Schafer (1994: 9) says, “keynote sounds do not have to be listened to consciously; they are overheard but cannot be overlooked.” Schafer further says that, “the keynote sounds of a landscape are those created by its geography and climate: water, wind, forests, plains, birds, insects and animals.” (ibid.: 9-10) According to Schafer, “many of those sounds may possess archetypal significance; that is, they may have imprinted themselves so deeply on the people hearing them that life without them would be sensed as a distinct impoverishment.” (ibid.) The second type of sound is *soundsignal*. Schafer says that “signals are foreground sounds and they are listed to consciously.” (ibid.) He adds that “in terms of the psychologist, they are figure rather than ground.” (ibid.) The third type of sound is *soundmark*. As Schafer says, “the term *soundmark* is derived from landmark and refers to a community sound which is unique and possesses

⁵ The first of them was a 1972 study *The Vancouver Soundscape*; one year later selected members of the group did a *Cross-Canada Recording Tour*, during which they made a great number of recordings and measurements. In 1975 a study *Five Village Soundscapes* was carried out in five European villages in Sweden, Germany, Italy, France and Scotland.

⁶ This is valid only if we consider that music is tonal if, from the perspective of musical tonality, it has a center around which the whole composition oscillates throughout its course and to which it returns at its conclusion. Tonality is typical for most European classical music of the 18th and 19th centuries.

qualities which make it specially regarded or noticed by the people in that community.” (ibid.: 10) Schafer supposes that “once a soundmark has been identified, it deserves to be protected, for soundmarks make the acoustic life of the community unique.” (ibid.)

I applied the theoretical assumptions described above to a case study of the soundscape of the Loreta Square in Prague. The model for it became the research project called the Kanda Soundscape Project carried out by a team of Japanese soundscape researchers headed by Keiko Torigoe (2002) in one of the oldest quarters of Tokyo in the years 1986–1988 and described in the first world publication dedicated to the studies and methods of soundscape research. Just as with Torigoe, there were, within the framework of my field research, two main approaches: (a) *one place oriented approach*, by means of which it was possible to research what sounds could be heard in the place under study and (b) *one sound oriented approach*, by means of which it was possible to research how the respondents hear the specific sound in the place under study. I carried out research of the soundscape, a component of which was a pilot study, by means of questionnaires. On the basis of the two above-mentioned main approaches, I divided the questionnaire into two parts. The first part (11 questions) contained questions about perception and interpretation of the daily sound environment of all of Loreta Square (henceforth called LS) from a long-term perspective; in the second part (5 questions) I based my questions on perception and interpretation of the sound of the Loreta Carillon (henceforth called LC).

On the basis of theoretical presumptions, I asked two main research questions: (1) Do there exist in LS, in the sense of Schafer’s definition, features of the soundscape and, if so, which sounds comprise them in LS? (2) Do there exist in LS, in the sense of Truax’s definition, definable relations between listeners, sound and environment?⁷ I developed these two research questions into six main preliminary hypotheses both for research perception and interpretation of the daily LS soundscape and from the long-term point of view for both perception and interpretation of LC sound.

⁷ Barry Truax (born 1947), Canadian musician, composer of electro-acoustic music, researcher in the field of soundscape studies and acoustic communication, member of the WSP. Truax’s acoustic communication approach, which is described in detail in his most important book *Acoustic Communication* (1984, 2001), is based on the presumption of the existence of system composed of three independent entities (listener, sound and environment) and on the impacts of the changes which could occur in any part of the system.

I set up the hypotheses for (a) *one place oriented approach* as follows: **1a) Sounds which the respondents notice and name in connection with the LS environment will be correlated with their ages.** Assumption: with the lowering age of the respondents there will be a growth in the number of sounds produced by electro-acoustic sound systems. **2a) Perception and interpretation of features of the soundscape (according to the definition used by WSP) by the respondents will be correlated with the usage of the LS environment.** Assumption: an examined sociological groups of LS users (employees of state institutions and private companies, local inhabitants) will analyze among themselves important differences in identification of features of the soundscape while, within those groups, there will be distinctive social features. **3a) Concepts of noise in an urban environment will be correlated with the ages of the respondents.** Assumption: with increasing age individual respondents will regard different kinds of sound as noise while I presume that they will prefer to regard as noise the sounds produced by people (transportation, loud speaking) and to a much smaller extent, sounds of nature (the songs of birds, the rustling of leaves on the trees). The second of three hypotheses for (b) *one sound oriented approach* was defined as follows: **1b) Respondents will, thanks to various demographic characteristics, assign various marks and values to the LC sound.** Assumption: as in case 2a), respondents will be able to separate into groups that will be able to analyze among themselves important differences in perception and interpretation of the LC sound, while within those groups there will, in that respect, be marked social features; **2b) Respondents with increasing age and a growing number of years of LS use will perhaps even consider the extinction of LC sound a great loss and an impoverishment of the soundscape of the LS.** Assumption: the longer respondents have been LS users, the more they will consider the sound not only a more interesting, but also a more valuable and important component of the soundscape of the LS. **3b) Respondents with increasing age and a growing number of years of LS use will regard LC sound as having cultural value.** Assumption: the longer respondents have been LS users, the more likely they will ascribe cultural value to the LC sound.

In a sample of the respondents practically all the groups of LS users were represented whereas only long-term LS residents or people working there for a long period took part in the research. Those who received questionnaires were not only people who work in state institutions (employees of the Ministry of Foreign Affairs of the Czech Republic and employees of Loreta) and peo-

ple who work for private companies (employees of the Hotel Loreta, employees of local restaurants, shops and cafés), but also other groups who participate in the LS space like local residents or members of the Council of Minorities of the Capuchin Brothers. A total of 83 questionnaires were distributed; respondents filled out and returned 70 of them. As for gender, 32 men and 36 women⁸ participated in the research. As for levels of education, 10 respondents finished elementary school, 28 finished secondary school, 30 had college degrees and two had other types of education. From the viewpoint of age, 6 participants in the research were 18 years old or younger, 10 respondents were between 19 and 25 years old, 13 respondents were between 26 and 35 years old, 9 respondents were between 36 and 45 years old, 19 respondents were between 46 and 55 years old, 9 respondents were between 56 and 65 years old, 3 respondents were between 66 and 75 years old, and 1 respondent was 76 years old or older. As for the LS usage, 20 respondents mentioned that they lived on LS, 37 respondents work on LS, 1 respondent lives and works on LS, and 12 respondents did not fill out this category.⁹ Regarding how long the respondents have been using LS, the results were as follows: less than 1 year 9 respondents (1 respondent 14 days, 1 respondent 1 month, 2 respondents 2 months, 1 respondent 3 months, 1 respondent 4 months, 1 respondent 5 months, 2 respondents 6 months), 8 respondents 1-2 years, 19 respondents 3-5 years, 6 respondents 6-9 years, 7 respondents 10-14 years, 8 respondents 15-19 years, 2 respondents 20-24 years, 2 respondents 25-29 years, 2 respondents 30-39 years and 6 respondents 40 or more years.

Let us now look at the results of the first part of the research from the angle of the main preliminary hypotheses. As for preliminary hypothesis No. 1a), this hypothesis was not confirmed. If we take into consideration the 11 sounds that respondents named more than twice, in 8 cases these sounds are connected with human activity. Of these 8 cases, in 2 of them their source is man (the sounds of tourists, human voices speaking), in 6 cases man is their creator (bells, autos, a street harmonica player, a little train for tourists, fireworks,

⁸ In 2 cases, it was not possible to determine the sex because, in one case, neither of the choices was selected (questionnaire No. 28) and, in the other case, both choices were selected by a husband and wife (questionnaire No. 63).

⁹ To the group of respondents who expressed their LS usage, I also included respondents who did not chose a) (live) or b) (work) in the questionnaire, but next to one choice wrote in a number of years. In regard to specification of a concrete length of LS usage, respondents considered this question answered. That occurred in 7 cases in questionnaires Nos. 51, 57, 65 and 76 (respondents who live on LS) and questionnaires Nos. 5, 19 and 30 (respondents who work on LS).

sirens). In 3 cases, they are natural sounds (birdlife, the wind, vegetation and trees). Sounds produced by electro-acoustic sound systems were mentioned in only three cases (“sirens” twice, “music from cafés” once). Thus the number of respondents is, from the viewpoint of effecting a possible evaluation, negligible. Significantly, the respondents did not express themselves either in question No. 7 (“Imagine that you have the possibility of creating the soundscape on LS according to your imagination. Which sounds would you like to add and which sounds would you like to remove in comparison with contemporary situation?” – only 8 respondents would add music to LS, in the clear majority however only acoustic music) or in the related question No. 10 (“Based on your personal or professional interests which criteria would you choose to define the situation of acoustic well-being on LS“ – only 1 respondent requested “lowering the volume of the music in restaurants“). Respondents in all demographic categories unambiguously prefer sounds whose sources or creators are man.

Preliminary hypothesis No. 2a) was not confirmed either. It appeared that perception of features of the soundscape¹⁰ do not depend on the LS usage by the respondents nor on demographic categories. The results are the following: a) *keynote* – sounds of autos – named by 41 (58.6%) of the respondents. Of them 21 were men and 18 women; 2 respondents did not express themselves precisely. From the viewpoint of education, this sound was named by 3 respondents with a basic-school education, 17 respondents with a secondary-school education, 20 respondents with a college education, and 1 respondent with another type of education. As for the age of the respondents, this sound was named by 2 respondents 18 years old or younger, 9 respondents 19-25 years old, 9 respondents 26-35 years old, 5 respondents 36-45 years old, 9 respondents 46-55 years old, 6 respondents 56-65 years old, and 1 respondent 66-75 years old. As for LS usage by the respondents, 9 respondents live on LS, 25 respondents work on LS, 1 respondent lives and works on LS, and 6 respondents did not pick any of the choices. As for LS use, not even one of the choices was picked. As far as the length of time of LS use 9 respondents have been using LS for less than 1 year, 5 respondents 1-2 years, 11 respondents 3-5 years, 5 respondents 6-9 years, 4 respondents 10-14 years, 2 respondents

¹⁰ For the purposes of this research I determined the concrete sounds that fulfill the role of features of the soundscape of the LS those sounds that were detected by more than 50% of the respondents. I have also taken into consideration the above-mentioned definitions of the features of the soundscape, the character of the sounds and their occurrence from the viewpoint of time in the LS environment.

15-19 years, 2 respondents 20-24 years, none of the respondents 25-29 years, 1 respondent 30-39 years, and 2 respondents 40 or more years; b) *soundsignal* – sounds of tourists – named by 38 (54,3%) of the respondents.¹¹ Of them, there were 19 women, 18 men, and 1 respondent who did not answer precisely. From the viewpoint of education, this sound was named by 3 respondents with basic-school education, 11 respondents with secondary-school education, 23 respondents with college education and 1 respondent with another type of education. As for the age of the respondents, this sound was selected by 2 respondents 18 years old or less, 4 respondents 19-25 years old, 7 respondents 26-35 years old, 6 respondents 36-45 years old, 15 respondents 46-55 years old, 3 respondents 56-65 years old, and 1 respondent 66-75 years old. In regard to LS usage by the respondents, 13 respondents live on LS, 17 respondents work on LS, 1 respondent lives and works on LS and 7 respondents did not answer. As for the length of time of LS usage, 3 respondents have been using the locality less than 1 year, 6 respondents 1-2 years, 8 respondents 3-5 years, 5 respondents 6-9 years, 5 respondents 10-14 years, 4 respondents 15-19 years, 1 respondent 20-24 years, 1 respondent 25-29 years, 2 respondents 30-39 years and 3 respondents 40 or more years; c) *soundmark* – sound of LC – selected by 44 (62,9%) of the residents. Of them, there were 18 men and 24 women; 2 respondents did not state the answer precisely. From the viewpoint of education, this sound was selected by 6 respondents with basic-school education, 15 respondents with secondary-school education, 22 respondents with college education, and 1 respondent with another type of education. As for the age of the respondents, this sound was selected by 3 respondents 18 years old or under, 3 respondents 19-25 years old, 7 respondents 26-35 years old, 7 respondents 36-45 years old, 14 respondents 46-55 years old, 6 respondents 56-65 years old, 3 respondents 66-75 years old, and 1 respondent 76 years old or older. As for the kind of LS usage by the respondents, 12 respondents live on LS, 23 respondents work on LS, 1 respondent lives and works on LS, and 8 respondents did not answer. As for the length of time of LS usage, 4 respondents have been using the locality for less than 1 year, 5 respondents 1-2 years,

¹¹ 2 respondents independently named 2 sources of sound related to tourism. In one case (questionnaire No. 32) the respondent mentioned especially “foreign languages” and “the guide’s voice”; in one case (questionnaire No. 80) the respondent mentioned especially the “buzz of tourists” and “comments of guides through a microphone”). In listing the answers received to question No. 2 (“Please make a list of three sounds which you imagine when someone says “Loreta Square”) I thus worked with 40 responses, while here with 38 respondents.

10 respondents 3-5 years, 5 respondents 6-9 years, 6 respondents 10-14 years, 5 respondents 15-19 years, 2 respondents 20-24 years, none of the respondents 25-29 years, 2 respondents 30-39 years and 5 respondents 40 or more years. From these viewpoints, then, we see clearly that the perception of features of the soundscape proceeds across all imaginable demographic categories.

Hypothesis No. 3a) was only partially confirmed. Respondents consider noise in an urban environment exclusively sounds whose source or creators are man. Respondents did not regard natural sounds as noise in even one case. Most of the time (28x) noise from automobile traffic was selected by 25 respondents.¹² If we look at their age structure, then 1 respondent was in the 18-years-or-less category, 6 respondents in the 19-25 category, 3 respondents in the 26-35 category, 5 respondents in the 36-45 category, 8 respondents in the 46-55 category and 2 respondents in the 56-65 category. Thus one cannot say that the sensation of this noise grew proportionately with age; on the contrary, we see a relatively high number of respondents in the younger age categories who mention the noise of automobile traffic. As for other demographic categories, this noise was mentioned by 13 men and 12 women. From the point of view of education, this noise was mentioned by 3 respondents with a basic-school education, 13 respondents with a secondary-school education, 8 respondents with a college education, and 1 respondent with a different type of education. As for LS usage, 7 respondents live on LS, 12 respondents work on LS, 6 respondents did not pick any of the choices. As for the length of time of LS usage, 4 respondents have used LS for less than 1 year, 3 respondents 1-2 years, 8 respondents 3-5 years, 1 respondent 6-9 years, 2 respondents 10-14 years, 3 respondents 15-19 years, 1 respondent 25-29 years, 1 respondent 30-39 years and 2 respondents 40 or more years. Thus once again in all demographic groups the clear majority of categories are represented.

We will now concentration our attention on the second part of the research which focused on the perception and interpretation of sound of the LC. As for hypothesis No. 1b), this hypothesis was only partially confirmed. 57 respondents wrote about concrete images, thoughts and memories; 6 respondents did not answer this question; 4 respondents had no concrete images, thoughts or

¹² 2 respondents named several sources of noise from automobile traffic. In the first case (questionnaire No. 66) the respondent named 3 sources: "the deep sound of motors of standing microbuses", "the sound of wheels of passing autos" and "the sound of motors of passing autos". In the second case (questionnaire No. 71) the respondent named 2 sources: "autos" and "autobuses". In listing the statements received in question No. 8 ("Does the noise exist on LS in your opinion? If yes, in what situations and contexts?"), I therefore worked with 28 responses, while here with 25 respondents.

memories, and 3 respondents crossed out this question. The images, thoughts and memories described by the 57 respondents were divided into 26 groups¹³ as follows:

1. Memories of childhood and/or memories relating to one's own family and family members (8x). The following answers were given: "memories from childhood... Most of the time was spent around Loreta and there were not a few experiences"; "When as a child I went to see a nativity scene in Loreta"; "nostalgia, longing for childhood, pleasure from the beauty of the sounds, pleasure from the admiration of the tourists, it's a pity that the song is so short"; "memories of youth and parents"; "youth, wedding, caresses"; "memory of mother, who was born and lived for twenty years at Pohořelec 10 and often remembered the Loreta bells"; "memories of visits to Prague in childhood" and "The LC sound was pleasant in a different way for everyone at different times. For my grandfather who was locked up in a nearby little house (Communist house of detention), it was unpleasant (in the 50s)."

2. Images related to perception of time (7x). Respondents mentioned the following: "It has already been a whole hour"; "It occurs to me that it is morning; actually it doesn't play at night"; "Another hour gone and I haven't accomplished a thing"; "A thought about the clock on the hour, memories of friends admiring the LC"; "I am aware of some of time segment"; "continuity" and "mornings."

3.-5. Romantic images (5x). The following answers were given: "romantic, devotion to the Virgin Mary"; "pleasant, romantic mood"; "Loreta litany, a square under a layer of ice, romantic nocturnal lighting, a hidden home..." "nostalgia, romance, joy" and "a fairy tale."

3.-5. Images related to work (5x). Respondents wrote these answers: "work"; "jobs"; "employment"; "work + humility toward history" and "employment, thoughts and memories of parents and friends."

3.-5. Images connected to a feeling of peace and tranquility (5x). Respondents expressed the following: "peace, evening, tranquility"; "pleasant tranquility"; "peace and tranquility" "acoustic tranquility" and "an early summer evening in a pleasant place."

6.-7. Images related to the history of the place (3x). Respondents mentioned: "the history of the place, restfulness"; "history – the legend of the con-

¹³ In view of the fact that these images, thoughts and memories of respondents were very varied, belonging to concrete groups can in some cases be understood as approximate and these answers could belong to several categories.

struction and of the carillon” and “the ancient and peaceful atmosphere of the quarter lying close by and at the same time isolated from the rush of the big city center”.

6.-7. Images related to religion and faith (3x). Respondents wrote these answers: “adoration of the Virgin Mary”; “believers” and “belief in God (Catholicism)”.

8.-9. Images related to home (2x). Two respondents mentioned “home”.

8.-9. Musical images (2x). Mentioned were “... church singing depending on the melody and the mood” and “The sound evokes folk music”.

10.-26. Other images (1x). 17 respondents mentioned the following: “church, village, noon”; “the bustle of the big city”; “at 10 o’clock entrance to the ‘U Černého vola’ restaurant”; “thoughts of LS come back to me”; “Although I have lived here all my life, I hardly notice the LC, but otherwise – a smile”; “uncertainty – I don’t know when the new owner of the house is going to throw me out on the street”; “the bell-founder Mr. Manoušek”; “wedding” “summer, vacation”; “the LC rings mainly on Sunday – and too often and long – a stereotype”; “Hradčany!”; “an image of a pleasant feeling in the soul”; “ancient costumes, peaceful walks, a pilgrimage to Loreta”; “It’s good that the bells are so high that nobody will steal them”; “gloomy images”; “a musty thing”; “literary motifs about a mother whose deceased children were reincarnated as bells + visual: Baroque motifs of angels floating over Loreta + nostalgic memories of personal experiences.”

As is clear from the above listings, the absolute majority of the respondents (81.4%) have concrete images, thoughts and memories, but none of their groups predominates strikingly because the biggest group consisted of only 8 respondents (that is 14% of those who had concrete images, thoughts and memories and 11.4% of the total number of respondents). This dominant group is strikingly smaller than the dominant group of respondents who agreed in their perception of features of the soundscape. If we look at the composition of this largest group from a demographic point of view, we find it is composed of 6 women and 2 men. From the viewpoint of their education levels, there are 2 respondents with an elementary school education, 2 respondents with a secondary school education, and 4 respondents with a college education. Division according to age is as follows: 1 respondent 18 years old or less, 1 respondent 26-35 years old, 1 respondent 36-45 years old, 2 respondents 46-55 years old, 1 respondent 56-65 years old, and 2 respondents 66-75 years old. According to their LS usage, 3 respondents live on LS, 3 respondents work on LS, 2

respondents did not choose any of the categories. From the viewpoint of the length of LS usage, in this group there are: 1 respondent who has been using this locality for 3-5 years, 1 respondent 6-9 years, 1 respondent 10-14 years, 2 respondents 15-19 years, 1 respondent 25-29 years, and 2 respondents 40 or more years. From the standpoint of all the demographic indicators, the group is very diverse and no group of respondents predominated markedly in even one instance. It is possible to call quite surprising the very low number of respondents (only 3) who connected the LC sound with images related to religion and faith because, from the point of view of religious significance, I expected a much greater number of respondents. Preliminary hypothesis No. 2b) was not confirmed. For 57 respondents (81.4%), that is, for a clear majority, extinction of the LC sound would mean, from the acoustic angle, a great loss and impoverishment. As for the high number of those respondents it is possible to state that this opinion was shared by the respondents throughout all demographic categories. This merely supports the vision of the LC sound as a soundmark perceived very strongly throughout all demographic categories. Preliminary hypothesis No. 3b) was not confirmed either. An even greater number, 64 respondents (91.4%), that is, an overwhelming majority, assigns cultural value to the LC sound. In view of the fact that I asked respondents whether the LC sound has cultural value without precisely defining what the cultural value of the LC consists of, the question can be asked how to define this cultural value of the LC sound and/or other soundmarks in a living environment by using the information received.

On the basis of the facts that came out of this research, I have come to the following conclusions: (1) the research unequivocally confirmed that in researching the LS environment it is clearly possible to identify (according to the definition used by Schafer and WSP) features of the soundscape: sounds of autos (*keynote*), sounds of tourists (*soundsignal*) and sound of LC (*soundmark*). These sounds are perceived by the majority (more than 50%) of the respondents across all demographic categories. I am convinced that a future transformation of these sounds would have a key influence on the assessment of the quality of the LS soundscape by the respondents. In the future it is also possible to make a comparative study that would show the change in the structure of the sounds that make up the content of the LS soundscape and its subjective perception by respondents. (2) The research also showed that when it is a question of perception of a concrete sound in the research environment (in our case the sound of the LC) respondents have at their disposal a wide range of images,

thoughts and memories evoked by the sound of the LC; however, no group of those images, thoughts and memories is heavily preponderant. An analysis of the largest group also showed that it is not possible to establish more precise combinations of criteria because the respondents are, from the viewpoint of the demographic groups we observed, very differentiated. (3) The research also opened the question of how to treat sounds to which we can ascribe the status of soundmark. As for Schafer's statement that "once a soundmark has been identified, it deserves to be protected, for soundmarks make the acoustic life of the community unique," the question arises in what manner do these sounds protect and assure that they will remain in the environment. The earlier WSP findings were confirmed: that in a living environment next to architectonic works there also exist concrete sounds that are characteristic for this environment, co-creating its identity¹⁴ and they are important for the people who participate in it. I presume that, in contrast to the very elaborate methods we have at our disposal to safeguard important architectonic works, we apparently stand at the very beginning of protection of this kind of sounds in a living environment.

I am convinced that questions posed by acoustic ecology will, in connection with changes in the soundscape of man, gain more and more importance. The research of Schafer's WSP group and a whole list of other projects, above all the work of researchers at the French institute CRESSON, have lent great impetus to it.

¹⁴ Here it is necessary to refer to the approach of the research team that was organized around the social philosopher Jean-François Augoyard and the architect and geographer Pascal Amphoux in the research institute Centre de Recherche sur l'Espace Sonore et l'Environnement Urbain (henceforth only CRESSON), which was founded in the French city of Grenoble in 1979, about which Schafer says that this is "perhaps the most significant team of 'soundscape' researchers in the world today ..." This team developed a complex research method for the identification and analysis of specific, representative locations in an urban environment which give the city its sonic identity. The key works which were focused on a description of this research method and its application in field research were published at the beginning of the 1990s (viz. references).

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