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ACCENT AND DIAEREME AND THEIR POSITION IN FUNCTIONAL PHONOLOGY

M.A. major thesis

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I hereby confirm that the present thesis was worked out independently. All sources are acknowledged in the accompanying list of references.

Dřevohostice, April 26th 2006

Aleš Bičan

CONTENT

SYMBOLS

[…]	phonetic transcription or editorial notes
/…/	phonological representation
italics	terms or words as spelled
"…"	meanings, contents of words or signs
'…'	other uses of quotation marks
SMALL CAPITALS	emphasis
/T, K, P etc./	archiphonemes
bold face	accent/prominence (depending on context), e.g. [fil**a**va] *head*
#	diaereme
p^i	phonological form
{…}	set of
P_x	position where phonological units stand
d^i	distinctive function
c^i	contrastive function
R	relation (e.g. $p^i R d^i$ – a relation between phonological form and distinctive function)
Ř	reverse/opposite relation
E	expression
C	content
S	sign
&	conjunction
÷	opposed by commutation with/to
+	syntagmatic relation
×	contrasted with/to
↔	commutation between
→	brings about, causes

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It is only due to the generousness of many people that the present work could be possible. It is first of all Tsutomu Akamatsu who kindly shared many papers of his and whose books introduced me into the intriguing aspects of functional phonology. I would also like to thank to a number of people who helped me in obtaining many useful works not unavailable to me. Most of all I want to give my thanks to Tobias Scheer and Bohumil Vykypěl who accessed me to a lot of important works. My thanks go also to Tomáš Hoskovec, Václav Blažek, Radek Skarnitzl, Katarína Petřiščáková and Marie Krčmová, to the latter for patiently answering my questions and for suggesting some improvements.

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PREFACE

The present work is an attempt to explore two phonological concepts, accent and diaereme, and to set their position within the theory of functional phonology. I will first present theoretical background of a phonological theory which is based on the assumption that language is a system of relations. Inspired, though not following in detail, by the glossematic theory of Louis Hjelmslev, I define two basic types of relations of language, paradigmatic and syntagmatic relations, as two logical operations, exclusive disjunction and ordered conjunction. The whole set of other relations in phonology such as *opposition*, *contrast*, *simultaneity* etc. are built upon the two basic relations. The relational view of language has also its inspiration in works by Jan W. F. Mulder, in particular in his book *Sets and Relations in Phonology*. Published in 1968, *Set and Relations* was a first attempt of its author to establish a consistent hypothetico-deductive theory of language. The theory was later formulated into a set of postulates (known as *Postulates for axiomatic linguistics*) and provides, in my opinion, a solid base for adequate descriptions of language.

Mulder's own theory is part of a larger theoretical framework called *functional linguistics*. It is a branch of linguistics practiced by a huge body of linguists who follow the teachings of Ferdinand de Saussure about the structural view of language, and the basic tenets of the so-called Prague School which maintains that language is endowed with functions. As the present work is above all delving into problems of phonology, my focus will be limited on a part of functional linguistics: functional phonology. This type of phonology is the one associated with the names of Nikolai S. Trubetzkoy and André Martinet. It will be most of all Martinet's type of functional phonology that will be followed here. Martinet's functionalism is also the type that served as the basis for Mulder's *Postulates*.

It is an unfortunate circumstance that both functional phonology in general and functional phonology of Martinet's branch in particular are neglected in certain quarters. First of all, interests of the Prague School after Trubetzkoy's death in 1938 and World War II shifted to other linguistic areas. Secondly, there seems to be a general contention that functional phonology is solely a domain of the Prague School. As a consequence of this, developments in functional phonology outside the School appear to be ignored. This is a situation of Martinet's functional phonological theory that is essentially a continuation of Trubetzkoy's phonology and therefore functional phonology *par excellance*. Another and the most intervening factor was the massive rise of generative linguistics (including generative phonology) in 1960s. This type of linguistic theory has been enormously successful in spreading all over the world to

such an effect that every other linguistic theory is doomed to live in the shadow of generative linguistics. What is more, other linguistic theories of today are ignored or subjected to fierce dismissal as out-of-date, primitive and generally needless.

The present work operates with functional linguistics and its concepts without any fear of not being appropriate. In the first part (INTRODUCTION) I give a brief historical overview of the development of functional phonology and explain what Martinet's type of phonology is and why it is in followed here. The second part (THEORETICAL BASIS) introduces the basic principles of Mulder's axiomatic functional theory. I explore some of the notions of functional phonology and attempt to give to them more productive definitions by employing various types of relations. However, it is not my wish to create a new theory here or even to redefine substantially the theory of functional phonology—I find the theory apt more than any other else. I attempt to make it more effective, though.

Although it is not suggested in the title of this work, my focus is largely syntagmatic. When dealing with phonology, analysts generally concentrate on setting up the number of phonological units (usually phonemes) of a given language, and theoreticians on procedures by which the setting up could be achieved. This is what I call *paradigmatically oriented phonology*. However, there are other aspects of phonological theory that deserve our attention. For instance, the way the phonological units are constituted in utterances and/or to what kinds of mutual relations they enter. This might be called *syntagmatically oriented phonology*.

Since I regard the distinction between the paradigmatic and syntagmatic aspect as one of the main properties of language, I believe this property can be taken as a differentiating criterion for different types of phonological units. There are units that enter only into paradigmatic relations with each other; units that enter only into syntagmatic relations; and units that enter into both types of relations. As already mentioned, this work is syntagmatically oriented. Its main topic forms therefore those units that enter into syntagmatic relations only. I establish two syntagmatic-only units: accent and diaereme. The first is discussed in the third chapter (ACCENT); the next chapter is devoted to the second syntagmatic-only unit (DIAEREME).

The main text of this paper is, in addition to summarizing CONCLUSION, accompanied by SUPPLEMENT. The content of the Supplement is a pre-print version of an article of mine, "Notes on Diaereme", which is to be published in *Sborník prací filozofické fakulty brněnské univerzity*. The article was submitted for publishing before this work was finished and was meant as a kind of extract of parts of the present paper. Although it is written (or hoped to have been written) to exist by itself without additional information, the topic of the article is tightly connected with the present paper. The article might be viewed as one part of this work. In order not to repeat what was already written or not to re-use portions of the article, I de-

cided to append it as a supplement to this paper. What is more, the article is often referred to in the main text, which makes little sense if there cannot be any feedback.

Many of the topics mentioned in "Notes" are discussed here in greater detail. On the other hand, the article contains topics little dealt with here. One of these is the third part of the article which discusses various manifestations of diaereme and its relation to accent. The latter topic is somewhat neglected in the present work; here the article is meant as a source of reference. As regards the manifestations of diaereme, the article is again much more informative in this respect. I touch upon this point in the last section of this paper's four chapter (*Structural and realizational implications of diaereme*). The section is conceived as a commentary of the third part of "Notes".

The present work is largely theoretical. Examples are scarce and only meant as illustrations of the discussed theoretical concepts. Though this may be viewed as a drawback, it was an aim of this paper. I believe a distinction between a language theory and a language description should be made. Both are necessary but the latter is impossible without the former. In principle, a language theory could exist without a language description but a description cannot be done without a theoretical apparatus. A field cannot be properly plowed without a plow or similar tools but the tools can exist, in principle, without fields. Naturally, the tools are useless if not used, but I do not claim a theory should be created without being employed as a tool for descriptions. It is, however, my contention that a theory should come before a description just as a plow should be forged before plowing. In this paper I seek to introduce an adequate tool for language plowing. The plowing itself will not be attempted in the limited space of the present work, though.

Note on the updated version (added 16 October 2006)

The thesis was successfully defended on 20 June 2006; it is now available in the library of Faculty of Arts, Masaryk University (in printed form) and also online in Thesis/Dissertation Archive of Masaryk University at the following address:

http://is.muni.cz/th/64391/ff_m/bican_MAmajorthesis.pdf

The present document is an updated version of the thesis—I took the liberty of correcting several spelling errors and slips. Though the versions are otherwise identical, this one is preferred. It is available online via *Linguistica* ONLINE at this address:

http://www.phil.muni.cz/linguistica/art/bican/bic-mamajor.pdf

1 INTRODUCTION

1.1 Motivation of this work

As is mentioned in Preface, the present work is largely theoretical. There are two reasons for this. First of all—and it was mentioned in Preface as well—we believe it is necessary to have a language theory before a language description is carried out. We need to have a tool for the description. There are many tools for language descriptions and we want to present one of them in this paper. It is a theory of functional linguistics (in short: functionalism). The theory appealed to us for its consistency and scientific rigor. This is what we believe to be the strongest criteria against which any theory should be tested. Moreover, it is also our belief that the theory of functional phonology is adequate for language descriptions.

However—and here we get to the second reason—personal experience has taught us that principles of functionalism, in particular of functional phonology that is going to be operated with here, are little known to the academic sphere in the Czech Republic. It may strike as strange, since it is actually the Prague Linguistic Circle that gave birth to functional and structural linguistics. This is because—as will be explained presently—we will operate with functionalism as practiced by André Martinet and Jan W. F. Mulder and their associates. This type of functionalism is in many respects different to that of the Circle's. Nor Martinet nor Mulder were ever members of the Circle, yet their linguistic (phonological) theories—we dare to say—are more truthful to the principles of the Circle as their were formulated in their classical era.

It is a doom of every not-so-common thing that it has to be described and explained to be understood. So is the case of the type of functionalism we chose to follow here. It is quite striking that, for example, in Luelsdorff 1983, entitled "On Praguian Functionalism and Some Extensions", or in Dirven & Fried 1987, entitled *Functionalism in Linguistics*, Martinet's functionalism is scarcely if at all mentioned. It seems that Martinet's works, if quoted by non-functionalists (cf. e.g. Pulgram 1970 or Hyman 1978) are not referred to by Praguian functionalists or are limited to Martinet 1955 and/or Martinet 1960 (this is of course dependent on particular linguists: for instance, Trnka 1966 mentions a number of Martinet's works; but then Trnka 1966 seems to be little known by Czech functionalists).

It is not our intention, however, to make any judgments about knowledge or ignorance of anyone here. Yet our personal experience has proven that the theory of Martinet's (needless to say, of Mulder's) functionalism is little known. For that reason, the present work, in addi-

tion to being theoretical, is also largely explanatory. We try to explain many general notions of this type of functionalism in the second chapter before we come to the main topic of this paper, accent and diaereme. We find it necessary, since we must explain what principles underlies the concept of accent and diaereme to be able to explain what they are. Therefore we spend several pages to the notions of relations in phonology and functions that the phonic substance can have. These are the basic building stones of functional phonology.

The original goal of our paper was to discuss the concept of diaereme. By *diaereme* we mean, more or less, what others called *juncture*. The concept of juncture has been extensively explored and discussed by linguists that employ descriptive tools other than functional. For instance, in America juncture has been an ongoing theme, an object of numerous discussions and a point of many disputes and disagreements. On the other hand, the problem covered behind juncture has been little discussed by functionalist linguists since the time of Trubetzkoy (who introduced the concept of *Grenzsignale*), either of the Prague wing or Martinet's one. Yet it cannot be denied that the problem of Grenzsignale and/or juncture is immensely important for phonological descriptions of languages. Since language is articulated (doubly articulated into signs and figurae) and since articulation is in fact a division into discrete things, we necessarily come, at every step in an analysis of a language, across points where one thing ends and another begins.

Therefore we decided to devote our work to the problem of junction in phonology. We set out to introduce the concept of diaereme, a notion that found its inspiration in the language theory of a Czech linguist Adolf Erhart. Though not a functionalist himself, Adolf Erhart was a linguist whose work was nevertheless highly stimulating for the present work. The way he treated diaereme and how he connected it with another phonological unit, accent, was a thing that appealed to us. Although we do not follow Erhart's theory here in every detail, it was the starting point for the present work.

Since both Erhart, whose theory was the ultimate inspiration for this work, and Mulder, whose theory is preponderantly followed here, group diaereme together with accent, we found it necessary to present a theoretical account on accent, too. Accent is a unit that is closely related to diaereme, because diaereme is a bundle of features that characterize the independency of words. In many languages words are also characterized by the presence of one accent within their extensions. It is especially in languages with a fixed accent where the interconnectedness of accent and diaereme is best seen, because the placement of accent is, as a rule, dependent on the placement of word terminals, be it either the beginning or the end of words. Therefore, accent is discussed here together with diaereme.

1.2 Functionalism

The origin of functionalism must be sought in the Prague Linguistic Circle—it should be noted that Vilém Mathesius, the founder of the Circle, was first to speak about *functional linguistics* (in Mathesius 1929). The origin of the Circle itself, inspirations and foundations of its members' thoughts are of course to be sought for elsewhere (especially in teachings of Ferdinand de Saussure) but we will not go any deeper here (for an excellent overview see Vachek 1994).

Although the Circle has a long tradition and has been even renewed in the recent years, the most important and most fertile period of the Circle was no doubt the time prior to World War II. The War was a turning point for many areas of human activity and can also be regarded as a point of splitting of functional linguistics. Since this paper is concerned with phonology, the history of functionalism will be summarized from the point of functional phonology.

Prior to World War II the most prominent persons in functional phonology were Nikolai S. Trubetzkoy and Roman Jakobson. The former may be called the founder of functional phonology but the role of Jakobson and a few other linguists (Mathesius, Vachek, Trnka et al.) should not be underestimated. However, it was first of all Trubetzkoy who formulated the most important concepts and principles of functional phonology (such as functions of the phonic substance and/or opposition). His final, though unfinished standpoint can be found in a truly magnum opus *Grundzüge der Phonology* (Trubetzkoy 1939). Jakobson is known for introduction of and emphasis on so-called distinctive features, though his distinctive feature theory gradually departed from a true functional theory (cf. for instance Jakobson & Halle 1956).

At the same time, though never a member of the Circle, a French linguist André Martinet was also delving into functional phonology. He found his views in accord with views of the Prague School and started to develop them intensively. If the World War II was a turning point in Praguian phonology, it was mostly due to the premature death of Trubetzkoy in 1938, flight of Jakobson to America and hampering of the Circle's activities. This and the separation of the world resulted in Martinet's developing a theory (and consequently a linguistic school) that differs from the theory of the Prague School linguists after the War. It is therefore preferable to speak about the Prague School and the Functionalist School (cf. Akamatsu 2001), though probably no two linguistic schools have so much in common. As to the language theory (as opposed to language description) our concerns will be heavily focused on the latter

school, because it presents a consistent and maximally functional language theory, a theory Trubetzkoy could have developed, had he lived longer.

Functionalist phonology is, like the whole functionalist linguistics, from the most part related with Martinet. He developed the concept of distinctive features, Trubetzkoy's oppositions, neutralization and archiphoneme (the latter notion was abandoned by the post-Trubetzkoyan Prague School) and phonological functions, and other concepts of functional phonology. Like many linguists of the second half of the 20th century Martinet became interested in syntax and his focus shifted to development of functional syntax (very different to functional syntax of the Prague School, to be noted!). Nevertheless, other linguists have been interested in and have developed functional phonology. It is most of all Tsutomu Akamatsu, a pupil of Martinet.

Another linguist influenced by teachings of Martinet's, Jan W. F. Mulder, developed what might be called a branch of functionalism: axiomatic functionalism. His *Set and relations in phonology* (Mulder 1968) was a functional account on phonology largely based on logic and set-theory. Mulder's approach to phonology (and functionalism in general) is much more formalized than Martinet's or Akamatsu's views and is in certain points different to them.

The difference between Martinet's functionalism on the one hand and Mulder's functionalism on the other may be called *realist* vs. *axiomatic* (cf. Akamatsu 2001: 1786, on realism in linguistics see also Martinet 1962: 1-38), though it may even be questioned whether axiomatic functionalism (sometimes called just *axiomatic linguistics*) is not an autonomous linguistic school. However, in this paper we will regard axiomatic functionalism as an axiomatic approach to the functional theory. In many respects this approach will form a point of departure in our account.

Mulder closely cooperated with Sándor G. J. Hervey in the development of axiomatic functionalism. In the recent years this type of functionalism has been further developed and extended into so-called *extended axiomatic functionalism* (see Dickins 1998). Mulder and Hervey's approach is called *standard axiomatic functionalism*, and it is the one that is reflected in this paper. Though a consideration of the extension would be worthwhile, it would unnecessarily overload this paper.

As already hinted, we chose Trubetzkoy's, Martinet's and Mulder's functional phonology for its appealing scientific rigor. Furthermore, after studying other phonological approaches, we came to a conclusion that this type of phonological theory is sound and appropriate. Naturally, one cannot avoid certain personal bias, but we do not claim that this theory is the best one or that it should be defended at all costs. What we believe to be scientific crite-

ria is consistency and the degree a theory can be improved by further data. As far as our judgment goes, the functional theory meets this.

Let it be noted that in what follows *functional*, *functionalist* and *functionalism* will refer partly to the theories of the classical (sc. pre-War) era of the Prague School and mostly to the theories developed by Martinet and other linguists associated with him.

Literature: On the history and theory of functionalism see Akamatsu 1988: 8-18, Martinet 1994 and especially Akamatsu 2001. For historical overviews of the Prague School and its theories see Luelsdorff 1983, Daneš 1987, Vachek 1994 or Čermák & Hajičová 2003. For a brief account on axiomatic functionalism see Hervey 1994. On extended axiomatic functionalism see Dickins 1998. For principles of functional phonology see Trubetzkoy 1939, Martinet [1960] 1991, Mulder 1968 and especially Akamatsu 1992a.

1.3 Basic assumptions

Three basis principles or assumptions of functionalism can be summarized as follows (see Mulder 1968: 7, Akamatsu 2001: 1768):

1. Language is a system of oppositions.
2. Language has a double articulation.
3. Language is a system endowed with functions.

The first principle is of course not peculiar to functionalism. The view of language as a system (or structure) of interlocking and intervening subsystems is the basis tenet of structuralism and goes back at least to Ferdinand de Saussure (de Saussure 1931). The interventions can be conceived via relations, in particular via paradigmatic and syntagmatic relations (oppositions in the above sense).

The second point is a principle for which Martinet is generally known. But if the theory is ascribed to him and if it is said to be "shared by no other school of structural linguistics" (Akamatsu 2001: 1779), it does not mean that it is as such new in its very basis. In short, it says that language can be articulated into significant units, i.e. units which have both expression and content, and these in turn can be articulated into distinctive units, i.e. those that have only form, but not any meaning (content). Martinet's emphasis laid on the principle is unique among linguistic schools, though.

Mulder's (axiomatic) interpretation of the double articulation theory is different to Martinet's (realist) one. In brief, Mulder equals double articulation with phonotactics (tactics

in phonology) and syntax (tactics in grammar), which, in his theory, means that language has both ordering of semiotic entities with only form and ordering of semiotic entities with both form and content. Since, *inter alia*, Mulder's interpretation implies Martinet's one, it will be preferred here.

Before Mulder introduced a set of axioms (see 2.1) upon which his axiomatic theory is built, he regarded the two points just described as the most important theorems of the theory (see Mulder 1968: 7). The third point, the third principle that language is a system endowed with functions is, however, no less important than those two. This principle, which is usually known as the functional principle or the principle of relevance, goes back at least to Karl Bühler (see e.g. Bühler 1931) and is advanced by both the Prague School and Functionalist School. Indeed, it is a point which unites the two schools, as they are both functional in this sense. Furthermore, it is a point which distinguishes them from other linguistic approaches, since no other puts so much stress on language functions. The principle of relevance ensures that only those things that are relevant for communication are retained and all irrelevancies are omitted.

Literature: for general overview of the principles see Mulder 1968: 7-8, Akamatsu 2001: 1768; on the double articulation see Martinet 1965a: 1-35, Martinet [1960] 1991: 1.8, on functions see Bühler 1934, Akamatsu 1992a: 17-24.

2 THEORETICAL BASIS

2.1 Axioms

Although Mulder's axiomatic theory is based on the assumptions mentioned in 1.3 (especially the first two), he felt necessary to build the whole theory on a set of axioms and accompanying definitions (together known as *Postulates for axiomatic linguistics*) so that the theory be maximally appropriate, consistent and powerful for descriptions. In many ways *Postulates* reflect the general theory of functional linguistics as advanced by Martinet, although there are certain disagreements between the realist (Martinet's group) and axiomatic (Mulder's group) functionalists. Be it as it may, the axioms provide a very solid basis for the point of departure in functional phonology and hence in our paper, too.

What follows is the final version as *Postulates* for standard axiomatic functionalism (Mulder 1989: 435ff.). Though not all axioms are important for our purposes, we mention the whole set for the sake of completeness.

Axiom A: All features in semiotic sets are functional.

> This axiom sets the so-called functional principle or principle of relevance (on which see also Mulder & Hervey 1980: 104-21). *Functional* is defined as "separately relevant to the purport of the whole of which it is a part" (Mulder 1989: 436). Since the purport of language is communication, functional in language are only those things that are relevant to communication. Moreover, the functional principle is the basic criterion in the theory, everything is sieved through it.

Axiom B: Semiotic systems contain simple, and may contain complex ordered, and/or complex unordered signa and figurae.

> In principle, this axiom states that language is doubly articulated, both in Martinet's and Mulder's sense, into entities with both form and meaning (signa) and entities with only form (figurae). It also introduces many important notions and concepts some of which will be discussed in the next section.

Axiom C: Cenological entities may have para-cenotactic features and plerological entities may have para-syntactic features.

As this axiom is of crucial importance for the present paper, its discussion will be postponed to a separate section (2.7). At this point it will suffice to say that Mulder's axiomatic theory is aimed to be a general semiotic theory and hence not limited to human languages only. This is a feature shared with Hjelmslev's glossematics. The prefix *ceno-* (and *cene-*) was also adopted therefrom. *Cenological* refers to be the frame of the second articulation, that is, to a universal system of figurae; in human languages *cenology* is *phonology*. On the other hand, *plerological* points to the frame of the first articulation, to a universal system of signs. For human languages, it may be conveniently replaced by *grammatical*.

Axiom D: All semiotic systems contain sentences, constituted by a base and para-syntactic features.

This axiom adds a sentential level to the theory, which is, however, of little importance for the present paper. The sentence is a domain for intonation (melodic curve), for instance.

Axiom E: There may be a many-to-one relation between cenetic form and figura (allophony), and between cenological form and signum (allomorphy), and vice versa (homophony and homomorphy respectively).

Though this axiom may be a matter of disagreement between the present writer and Mulder (see below), what is especially important for our discussion are relations between signa and figurae. In this respect the axiomatic account is much more consistent than other theories, even than Martinet's.

The sign (S) is a union (conjunction) of expression (E) and content (C). E presupposes C and *vice versa*. What is more, S presupposes both E and C and *vice versa*. In other words, all three terms presuppose each other. Expression is a set of phonological forms (p) to which a particular distinctive function (d^i) is related. In grammar this distinctive function is in fact a semantic function of a given phonological form. Content is the same set, but the relation between the set of phonological forms and the distinctive function is the converse one. A morph or allomorph is a particular phonological form (p^i) to which a particular distinctive/semantic function is related (d^i). This is the crucial point, since allomorph is also a sign—a particularized sign with expression and content! It is not pure form (expression) or a realization of a sign (morpheme). The sign (called *moneme* by Martinet et al.; but we will stick to *morpheme* here) is a set of particular signs (allomorphs or variants of a moneme) grouped together due to having

the same distinctive (semantic) function and the same or similar phonological form. Neither moneme (morpheme) nor its variants (or allomorphs) can be said to consist of phonemes—they are all signs and hence consist of expression and content. This error is committed by many linguistic schools (cf. e.g. Bloomfield 1933: 161) and linguists in general without ever realizing or being willing to realize that this leads to a number of inconsistencies (on this see Mulder 1968: 36). Now, what is really built of phonemes is the phonological form of a sign. In other words, a sharp distinction between phonological form (*p*) and expression (E) of a sign is made. To put it in symbols (adapted from Mulder 1989: 158; on the meaning of the symbols see p. iv of this paper):

	symbolized	*definition*
morph (*allomorph*)	$p^{i}Rd^{i}$	$p^{i}Rd^{i}$
expression	E	$\{p^{i..n}Rd^{i}\}$
content	C	$\{d^{i}\check{R}p^{i..n}\}$
signum	S	E & C

In his theory Mulder goes one level down to relations between phonological form and phonetic form (the latter being a class of impressionalistically similar sounds (see Mulder 1989: 455)). However, this may rather be the domain of realizations, manifestations or representations of models (such as sign, phonological form and/or phonemes) as opposed to the models themselves. In other words, the present writer does not think that the relation between morpheme and allomorph is not the same as the one between phoneme (or phonological form) and allophone. An allophone is a manifestation of a phoneme, substantiation (i.e. acquiring substance as opposed to form in Hjelmslev's terms) of the phoneme, whereas an allomorph is an instance of a morpheme, a model like the morpheme (cf. Bičan 2005: 2-3, Šaumjan 1962, Šaumjan 1968: 15ff.).

Axiom F: Signa may be realized an unlimited number of times (in actual communication), each resulting utterance denoting a denotatum which may belong to a potentially infinite denotation class.

This is an axiom for axiomatic semantics introduced by Hervey (described in Hervey 1979; previous axioms were introduced by Mulder) and as such is of practically no importance here.

Literature: For a preliminary version of *Postulates* see Mulder 1968: 10-12; the full version in Mulder & Hervey 1980: 40-63 and revised version in Mulder 1989: 435-57. For postulates for axiomatic semantics see Mulder & Hervey 1980: 203-11. For a provisional set of postulates for extended axiomatic functionalism see Dickins 1998: 351-417.

2.2 Language as a system of relations

The view of language as a system of relations goes back (at least) to de Saussure's *Cours de linguistique générale* (de Saussure 1931). There are two basic types of relations in language that are generally acknowledged and operated with. In fact, they, too, go back to de Saussure's *Cours*. It is *paradigmatic* and *syntagmatic* relation. Linguists are usually agreed upon the point that language is constituted of the paradigmatic and syntagmatic axis. The distinction between these relations can be traced in probably every modern linguistic theory but the extent they are utilized within the theories differs. What is more, the relations are rarely explained in a rigorous way; usually a common-sense explanation is provided such as the following: Units are said to be in paradigmatic relation if they are replaceable in the same context; they are in relation *in absentia*. On the other hand, units that co-occur in a certain linear sequence, say a word or sentence, are said to be in syntagmatic relation; they are in relation *in presentia*. Such loose explanations are, however, not satisfactory if we want to have a firm, powerful and consistent language theory.

Fortunately, there have been linguists that felt need to introduce exact definitions of the two types of relations. One of the first was Louis Hjelmslev whose apparatus of definitions is well-known (if only for its awkwardness).

It should be noted at this occasion that here the term *relation* is not necessarily meant as a pure mathematical notion, though it might be applicable, too. It may be understood quite intuitively as a mutual dealing and/or connection between two or more things. In many ways, our relations will be similar or even identical to what Hjelmslev called *function* (see Hjelmslev 1961: 33ff.). Since there is a difference between the use of *function* and other terms in functional linguistics and in glossematics, the latter usage will be marked by a subscript 'H' (sc. function$_H$ etc.) if necessary.

Despite the terminological difficulties and perhaps an unnecessary abstract view of language (which has been repeatedly criticized), Hjelmslev created a solid base of definitions which could be further taken advantage of. His view of—what we call—paradigmatic and syntagmatic relations can be used as a basis for additional furnishing and refurnishing. In fact,

one of his notions, *commutation*, which is paradigmatic relation *par excellance*, became a key notion in functional linguistics.

As mentioned, Hjelmslev's views can be used as a basis for further development. This means that we find—alongside with others—Hjelmslev's definitions unsatisfactory in certain respects. In many ways of classification of relations will be similar to Hjelmslev's account on functions$_H$ but we will attempt to expand the apparatus.

Another linguist who presented rigorous definitions of paradigmatic and syntagmatic relations was Jan W. F. Mulder. The difference between paradigmatic and syntagmatic relations is deducible from one of the basic assumptions that language is a system of relations (see 1.3); this is in turn incorporated into Mulder's *Postulates*. Paradigmatic relations are defined as "relations of opposition between members of sets" and syntagmatic relations as "ordering relations between semiotic entities in combinations (constructions)" (Mulder 1989: 441).

In principle these definitions would be sufficient and satisfactory. The definition of syntagmatic relations is in particular very usable and will be adopted here. However, we find the definition of paradigmatic relations a little problematic because nowhere in Mulder's *Postulates* is the relation of opposition defined. It is, however, our contention that opposition, being a paradigmatic relation, should be precisely defined, as it is one of the most important notions in phonology. Without the notion of opposition we could not establish relevant features in the first place and consequently not even phonemes.

We believe that paradigmatic relations should be defined differently. Then, deriving from this definition, we should establish the relation of opposition. As to the definition of paradigmatic relation we find it convenient to return to Hjelmslev's conception.

What follows is an attempt to define the basic concepts of functional phonology in terms of relations. The set of definitions is rather provisionary, as our aim is not to build a new hypothetico-deductive theory that would replace Mulder's axiomatic (let alone functional) theory.

Def.: *relation* for 'the whole represented by *x* R *y* where R is the relator, *x* and *y* are relata (*x* being the domain and *y* the counter-domain)'.

> The definition is taken from Mulder 1968: 36 and the principles advanced there are followed here. It has to be, however, noted that *relation* need not be just binary, sc. between two relata (also called *terms*). Both in principle and practice relation between multiple terms can be postulated.

Def.: *ordered relation* and *unordered relation* for 'symmetrical relation' and 'asymmetrical relation', respectively.

A symmetrical relation is such a relation R if *x* R *y* implies *y* R *x* (again it can be postulated for more terms). See Mulder 1968: 36, Mulder 1989: 440.

Def.: *relation of exclusivity* for 'the logical operation of exclusive disjunction'.

In logic this operation is usually set between two entities but it can be postulated for more entities. Exclusive disjunction may be regarded as a special type of a disjunctive operation when an expression (in the logical sense) is true if only one of its terms is true—in 'normal' disjunction an expression is true also if both members are true. In practice, exclusive disjunction means that one entity excludes the other.

Def.: *paradigmatic relation* for 'relation of exclusivity between semiotic entities'.

In logic, disjunction and other logical relations operate with truth-values but we will reinterpret it for our purposes as *presence* (true) vs. *absence* (false). Exclusive conjunction is such when the presence of one entity excludes the presence of another entity or other entities.

Hjelmslev uses the logical operation of disjunction for the definition of the 'either-or' function$_{H}$. The function$_{H}$ is in turn called *correlation*$_{H}$, which is paradigmatic relation in our sense (see Hjelmslev 1961: 36). Though not mentioned, by disjunction Hjelmslev means exclusive disjunction, since 'normal' disjunction allows for both (or all) of its terms to be true or present. For paradigmatic relation the ordering is not relevant. Let it be noted that *correlation* was used in yet another sense by Trubetzkoy (German *Korrelation*, Trubetzkoy 1939: 77).

Def.: *relation of inclusivity* for 'the logical operation of conjunction'.

Here, unlike in the case of relation of exclusivity, entities in relation of inclusivity presuppose each other, i.e. the occurrence of one is dependent on the occurrence of another. Once again, we will not speak about truth-values but about *presence* vs. *absence* of entities.

Def.: *syntagmatic relation* for 'ordered relation of inclusivity between semiotic entities in constructions'.

Syntagmatic relation is such a relation between entities when their order is relevant, i.e. it is relevant (functional) if a certain entity precedes or follows another, though

both are dependent on each other. Syntagmatic relation cannot be equated with the pure relation of inclusivity just like paradigmatic relation is equated with the logical relation of exclusivity—this is because, in language, it is the ordering of entities that is functional: the syntagmatic aspect is the ordering aspect.

Def.: *co-occurrence* or *simultaneity* for 'unordered relation of inclusivity'.

Hjelmslev defined *relation*$_{H}$ (syntagmatic relation in our sense) as simple conjunction without introducing the criterion of ordering. We think it important to distinguish 'ordered conjunctions' from 'unordered conjunctions'. The relation of co-occurrence or simultaneity is established, for instance, between relevant features within a phoneme. Indeed, simultaneity is one of the criteria for the sum of relevant features a phoneme consists of. The phoneme is at the same time the minimal phonological unit that enters into ordering relations—to syntagmatic relations in our sense.

Def.: *construction* for 'self-contained complex of entities in phonological system'.

Taken from Mulder 1989: 440. Self-contained system or complex means "representing all relative dependencies of its members (or constituents), as members (or constituents) of the set (or combination), in question" (*op. cit.*: 436).

Def.: *positions* for 'divisions within a phonotactic construction, such that in every such division an entity can stand and commute with other entities' (see Mulder 1989: 443).

Def.: *phonotactic* for 'syntagmatic in phonology'.

Phonotactic relations are syntagmatic, i.e. ordering relations between phonological entities in constructions (cf. Mulder 1989: 441). *Phonotactic entity* is an entity that is orderable.

Def.: *commutation* for 'alternation (or choice) between entities in paradigmatic relation, in a given position'.

On *commutation* cf. Hjelmslev 1961: 73. The commutation is the basic tool by which phonological units are established from the paradigmatic point of view. The procedure is called *commutation test* (on which see Akamatsu 1992a: 60-80, cf. also Hjelmslev 1961: 74-5). It is different to so-called *minimal pair test* because the commutation is between two or more entities whereas minimal pairs are usually two.

Def.: *opposition* for ‘paradigmatic relation between two or more entities such that the difference between them is functional’ or simply ‘functional paradigmatic difference’.

As mentioned above, Mulder does not give any special definition of *opposition*, though it is an important concept of functional phonology (“Man darf ja nie vergessen, daß in der Phonologie die Hauptrolle nicht den Phoneme, sondern den distinktiven Oppositionen zukommt”, Trubetzkoy 1939: 60). However, we think it can be defined in terms of relations. It is important and advisable to distinguish between (simple) opposition and commutative opposition (see below) in order to account for the fact that phonemes are opposed to one another in the over-all phonological system of a certain language but not all phonemes are mutually opposable by commutation. A famous example may be English phonemes /h/ and /ŋ/. Though the phonemes are opposed in the phonological system of English, they do not commute, since they occur in mutually exclusive contexts (/ŋ/ occurs predominantly word-finally where /h/ never occurs).

Def.: *commutative opposition* or *opposition by commutation* for ‘paradigmatic relation between entities of expression (phonological entities) such that commutation between them brings about commutation between entities of content (meanings)’

Commutative opposition is a special kind of opposition. In fact, opposition in the system or set of all phonemes presupposes commutative oppositions between intersecting subsets of the phonemes. The point is that though all phonemes are mutually opposed, not all of them are opposed by commutation at the same time.

Def.: *neutralization* for ‘suspension of commutative opposition’

Alternative definition for *neutralization*: ‘the inoperability of a phonological opposition between two or more phonemes in some context or contexts […] which is operative elsewhere […] in a given phonological system’ (Akamatsu 1988: 111)

Neutralization is an important notion in functional phonology. It is a concept used by other linguistic schools, though differently defined. See Davidsen-Nielsen 1978, Akamatsu 1988. Cf. also below and Hjelmslev’s *suspestion* (1961: 88).

Def.: *permutation* for ‘alternation (or choice) between units in syntagmatic relation’.

Mulder does not define this notion; he notes: “Though the term ‘permutation’ may seem the syntagmatic equivalent of ‘commutation’, it is used in a realizational, rather than structural sense, though there may be structural implications.” (Mulder 1989: 441). Cf. also Hjelmslev’s *permutation* (1961: 73-4).

Def.: *contrast* for ‘syntagmatic relation between two or more units of expression (phonological entities) such that difference between them is functional (i.e. relevant for communication)’ or simply ‘functional syntagmatic difference’.

The term *contrast* should not be confused with the usage of American and other linguists who use it as a synomym of *opposition*. In functional linguistics contrast is the syntagmatic equivalent of opposition. On *contrast* vs. *opposition* see Jakobson [1951] 1961: 442, Jakobson & Halle 1956: 4-5, Martinet [1960] 1991, 1.20, Akamatsu 1988: 19-21, Akamatsu 1992a: 110-2; it goes back to de Saussure’s *rapport syntagmatique* and *rapport associatif* (de Saussure 1931: 170-5).

Def.: *concord* for ‘suspension of contrast’.

Alternative definition for *concord*: ‘the inoperability of a phonological contrast between two or more contrastive units in some context or contexts which is operative elsewhere in a given phonological system’.

Concord will be dealt with in 4.7.

2.3 Basic phonological units

Def. *entity* for ‘element, or discrete analytical property of element’ (Mulder 1989: 436).

Element and/or *item* are primitive terms and are to be used in their ordinary sense. *Semiotic entity* is an entity in a semiotic system. Basic semiotic entities are *signs* and *figurae*.

Def. *features* for ‘elements, analytical properties of elements or relations between elements or analytical properties of elements’ (Mulder 1989: 436).

Def.: *unit* for ‘an object of an analysis.

The notion of *unit* is meant to be, more or less, a cover term for *entities* and *features*. *Phonological units* are objects of analysis in phonology. Note that *significant unit* is a sign, i.e. a unit with both meaning and form. The minimal sign—the minimal significant unit—is usually called *moneme* by functionalists; we will use *morpheme* here but it should be remembered that a morpheme is the minimal sign, not anything else.

Def.: *distinctive unit* for ‘a term of opposition’.

Oppositive unit may be possible, too.

Def.: *contrastive unit* for 'a term of contrast'.

Def.: *relevant feature* for 'the minimal distinctive unit that does not enter into syntagmatic relations'.
Alternative definition for *relevant feature*: 'a complex of multiple non-dissociable distinctive phonic features' (Akamatsu 1988: 100).

> In terms of Hjelmslevian *form* vs. *substance*, the first definition refers to form; the second, alternative definition refers to substance. The relevant feature is of course a construct (a model) given by the sum of oppositions with other relevant features (see Mulder 1968: 187, Akamatsu 1988: 108-10) but is also substance-based. It would be perhaps more preferable to used *distinctive feature* instead of *relevant feature* as does Mulder. The latter term is, however, preferred by Martinet and Akamatsu (see Akamatsu 1988: 77ff., Akamatsu 1992a: 35) in order to avoid confusion with Jakobsonian or Chomskyan distinctive features that are universally and *a priori* established and binary. Functionalist relevant features are none of these.

Def.: *phoneme* for 'the minimal distinctive unit that enters into syntagmatic relations'.
Alternative definition for *phoneme*: 'a simultaneous (i.e. unordered) bundle of relevant features'.

> This means that *phoneme* is, by its virtue of being a distinctive unit, the minimal unit that enters into both paradigmatic relations (oppositions) and syntagmatic relations (contrasts).

2.4 Functions of the phonic substance

(1) *Functional as a criterion*

Functional linguistics is unique among other structural linguistic schools in the sense that it is deeply concerned with language functions. The adjective *functional* is not here any fancy or dummy attribute like in certain other linguistic approaches that call themselves *functional* (cf. Mulder 1979). To be functional is to be "separately relevant to the purport of the whole of which it is a part" (Mulder 1989: 436). To be functional in language means to be relevant for communication, since this is the main purport of any human language. Only those properties that are functional are important for a linguistic analysis. In the realm of phonology, only those phonic elements which are functional in a given language should form the scope of a phonological analysis. This is of course not to say that non-functional phonic fea-

tures should be ignored by linguists. They are only dealt with when it comes to descriptions of actual realizations of phonological units.

This said, it should be clear that, in the first place, *functional* should not be restricted to mean *distinctive*, though such a limitation of use seems to be a rather unfortunate practice among many linguists (see e.g. Palková 1997: 277 where Czech accent is said not to be phonologically functional, though in the subsequent sentence it is recognized to have a delimitative function!).

Since the present paper deals with phonology, we will restrict our discussion to functions of the phonic substance, though we do not want to deny importance of other language functions. In the present work our interest will be limited to three functions: *distinctive function*, *contrastive/culminative function* and *deliminative function*.

(2) *Distinctive function*

The most important function of the phonic substance is undoubtedly the distinctive function. The distinctive function may be called *paradigmatic function*, since it is derived from the paradigmatic aspect of language. Although our interest in this paper is focused on syntagmatic phonology, we will discuss the distinctive function because of its relevancy to further discussion.

The distinctive function may well be called an *oppositive* function, because its nature is directly derived from the notion of *opposition*. In 2.2 we have defined *opposition* as "paradigmatic relation between two or more entities such that the difference between them is functional". An entity that is a term of an opposition is said to have distinctive function. Since being a term of opposition implies being a term of commutative opposition, an entity has distinctive function if it is capable of distinguishing the meaning by being commutable with another entity in a given context.

A number of entities can have distinctive function, since there is no restriction on the extension of terms of oppositions. The smallest phonological entity that is a term of an opposition and hence has distinctive function is the relevant feature. Unlike relevant features, which are not capable of ordering, phonemes possess this capacity. They are other, actually more typical phonological units that have a distinctive function. In fact, though being bundles of relevant features, they are the smallest units of phonotactics. Phonemes can and do enter in syntagmatic relations. As such they can acquire other functions, though distinctive function might be said to be an inherent function of the phoneme.

(3) *Contrastive and culminative function*

The other functions dealt with here may be called *syntagmatic functions*, because they are derived from the syntagmatic aspect of language. The contrastive function, as the name suggests, is directly derived from the syntagmatic relation of contrast. The deliminative function is in turn derived from the contrastive function; in fact it is a special kind of contrastive function.

The contrastive function, as introduced by Martinet (see e.g. Martinet [1960] 1991 3.1), is usually defined in functional phonology as "a function whereby the listener can analyze how many successive significant units are contained in an utterance" (Akamatsu 1992a: 22). This means that in an utterance some entities show a certain difference such that this difference, when contrasted with entities lacking the difference, can help the listener analyze the significant units within the utterance. This is because usually a significant unit contains precisely only one instance of such an entity.

In his *Grundzüge* (Trubetzkoy 1939) Trubetzkoy discusses functions of the phonic substance (including the distinctive function, which is naturally given most space). He mentions *gibfelbildende Funktion* or *kulminative Funktion* (*op. cit.*: 29). The culminative function corresponds more or less to Martinet's contrastive function, though there may be certain doubts as to the correct interpretation of Trubetzkoy's *kulminative Funktion* (see Akamatsu 1992a: 20). For our purposes we may ignore these doubts and assume that what Trubetzkoy calls *culminative function* Martinet calls *contrastive function*.

The most typical contrastive unit is accent (to be discussed in detail in chapter 3). In many languages the word has one instance of syllable which bears accent. The accented syllable exhibits certain prominence as contrasted with other, unaccented syllables, and forms the peak of the word. Every such a peak equals a word. The accented syllable as if culminates in the significant unit. This is what justifies the term *culminative* instead of *contrastive*. Actually, we may take advantage of these terms for making a distinction in the functional theory.

We have defined *contrast* as a kind of syntagmatic relation between units of expression such that the difference between them is functional. In this respect it is the syntagmatic counterpart of opposition. Further we said that the distinction function is closely connected with opposition, since a term of opposition had a distinctive function. We can say that if an entity is a term of contrast (i.e. it is contrasted to other entities), it has a CONTRASTIVE FUNCTION. The contrastive function defined in such a manner is, however, probably only good for the theory, since within a certain phonological form (e.g. /**i**nsalt/, a phonological form of English noun *insult*; bold face indicates accent) the constituting phonemes are contrasted with one another but the particular differences between the phonemes (/i/, /n/, /s/, /a/, /l/, /t/, for the no-

tation cf. Mulder 1989: 222, 250-2) are not of much importance (cf. Haas 1962: 626). Nevertheless, we can say that there is a contrast between vowels and consonants as classes of phonemes that differ in their distributions. The difference between vowels and consonants within a phonological form does not usually help the listener distinguish between significant units but the difference is nevertheless functional—contrastive (cf. Martinet [1960] 1991, 3.21).

What is more important in the phonological form in question (/**i**nsalt/) is the contrast between the first accented syllable and the second unaccented one. Besides being a simple contrastive difference, it can obviously help the listener distinguish between significant units, since such a type of contrast, unlike the contrast between particular phonemes, occurs usually only one within phonological forms of English words. Such a function, which is a special kind of contrastive function, we will call CULMINATIVE FUNCTION.

(4) *Deliminative function*

The last function to discuss is the *deliminative function*. It is sometimes called *demarcative function* (see the discussion in Akamatsu 1992a: 21) but this time we are not going to draw any specific distinction between the two terms. We will simply speak about the deliminative function and the term *demarcative* can be understood as an alternative.

The deliminative function is a syntagmatic function. Once a distinction between contrastive and culminative function is established, we can say that the deliminative function is a special kind of contrastive function and is in fact ultimately derived from the culminative function. This is because the deliminative function presupposes the culminative function. An entity functioning delimitatively functions also culminatively (on this see Mulder 1968: 69-70).

As the name suggests, it is a function that has something to do with delimitation. Again, an apt definition is given in Akamatsu 1992a: 21: it is "a function whereby a phonic element indicates the boundary between significant units (i.e. so-called 'words', 'word-combinations' or 'morphemes' […]) in an utterance". This means several things: 1) a phonic entity (usually a special manifestation of a certain phoneme) is so markedly different than other phonic entities that this difference must be accounted for a grammatical boundary (usually a word boundary); 2) a certain phoneme has such a distribution that, in contrast with other phonemes, the limited distribution is again accounted for the occurrence of grammatical boundary; 3) there are certain phonological and what is usually called morphonological processes which once again must be accounted for the occurrence of a grammatical boundary. The problem of delimitation is tightly connected with the concept of *diaereme* that will be discussed in detail in chapter 4.

It is to be noted once again that the deliminative function is a syntagmatic function, ultimately derived from the contrastive/culminative function. It means that an entity that has deliminative function has to be a term of contrast. Such an entity possesses certain qualities which make it different from other entities in syntagmatic relation. An entity that has deliminative function has also culminative function by implication (and of course also contrastive function as we have defined it) because there can be no better way to help the listener indicate a significant unit than by highlighting its boundaries. It follows, therefore, that an entity which has deliminative function has also culminative function. However, it does not hold *vice versa*: an entity with culminative function need not necessary marks grammatical boundaries (as is the case of a free accent).

2.5 Zero position

We defined *position* as a division within a phonotactic construction, such that in every such division an entity can stand and commute with other entities. We can say that a position is an intersection of the paradigmatic and syntagmatic axis. In this we follow Mulder who presents a firm concept of the theory and hence formally establishes what others use intuitively, since the notion position or context is often alluded to in phonology. Mulder, in addition, introduces so-called *archi-positions* as products of neutralization of contrasts between positions (see Mulder 1989: 443 and especially Mulder 1968: 26-8, 104-7). In this paper we will leave the question of archi-positions untouched.

We would like to, however, introduce *zero position*, though it is rather a pseudo-position, since it is not an intersection of the paradigmatic and syntagmatic axis. In fact, it is a position (or, better, a place) where diaereme (or juncture if you like) and only diaereme appears. In chapter 4 we will define and try to justify the concept of diaereme in functional phonology. At this connection it will suffice to say that it is an entity whose primary function is delimitation of significant units. The zero position is simultaneous with the presence of diaereme (a word-junction) and the positions within a phonological form of a word are defined with respects to diaereme. Hence word-final position is the position before diaereme and word-initial position is the position after diaereme (on this cf. also Pulgram 1970: 45-6).

2.6 Syllable

The syllable is a recurrent theme in linguistics. There has been much discussion on its nature and relevance for phonological analyses. They may be even disagreements among

functionalists themselves (cf. Mulder 1968: 27, 69 and Bičan 2005: 13). One of the greatest controversies is the definition of consonants and vowels on the basis of the syllable. Many phonological schools lay much stress on the syllable and on phoneme or element classes derived from the syllable—recently and most conspicuously some generative-phonological approaches. The problem is that we may not be able to divorce syllabicity from vocality. In other words, "it may be stated that each syllable contains one vowel – and then the vowel is defined as the kind of sound that forms the nucleus of a syllable" (Pulgram 1970: 11, cf. Martinet [1960] 1991, 3.21). This is obviously a circular and therefore an empty statement. Although there were attempts to define phonological categories on purely distributional basis (see Trim & O'Connor 1953, Arnold 1955/56 and Newton 1970), there still remain certain doubts but it is not an aim of this paper to deal with them.

In the present paper we will suppose that the syllable both exists and can be somehow defined from the phonological point of view. In fact we can adapt Mulder's view that the syllable is the smallest extension of what he calls *distributional unit*, the latter being a unit upon which we can exhaustively describe distributions of phonemes in a given language (Mulder 1968: 26-7, 177-8). Like other phonological concepts, the syllable is a model, a purely phonotactic (not paradigmatic and/or distinctive) unit of distribution.

As will become clear from the subsequent section, the importance of the syllable is also in the fact that it, *qua* phonotactic entity, provides the base for para-phonotactic features such as accent and/or tones. It is the accented syllable that contrasts with unaccented ones, and it is the syllable upon which we can register oppositions of tones or tonemes in so-called tone languages.

2.7 Phonotactics and para-phonotactics

Since Mulder follows the double articulation theory and recognizes the paradigmatic and syntagmatic aspect, he divides phonology, as the level of the second articulation, into *phonematics* and *phonotactics*. The former deals with the paradigmatic nature of phonological units; the latter with their syntagmatic (ordering) nature. Such a distinction is of course not new. In addition, Mulder introduces a distinction between *phonotactics* and *para-phonotactics*. This distinction is not new either, since the level of para-phonotactics corresponds to what other called *suprasegmental* or *prosodic*. Para-phonotactics is, however, fully governed by the functional principle—like everything else in functional phonology.

The distinction between segmental and suprasegmental features is most known. It originates in American structuralist phonology but this type of phonology was always practi-

cally oriented and the distinction was usually based on the phonic nature of certain features, not on roles these features fulfilled in language. This necessarily led to certain problems and the distinction proved inadequate.

As an example we may give a glottal stop. From the phonetic point of view it is clearly a segmental sound, not a suprasegmental like length, intensity and/or melodic curve. The FUNCTION of the sound differs from a language to language, though. The phonological analysis of Arabic reveals that it is a (segmental) phoneme of that language. On the other hand, in Danish this sound has to be interpreted as a prosodic element—so-called *stød*—since it functions like a kind of accent (see Martinet 1937: 94f., Trubetzkoy 1939: 194-6, Martinet 1949: 11, Ladefoged & Maddieson 1996: 54). In Czech (and a similar situation is in German), the function of this stop is yet another: since it occurs only word-initially (and in certain situations at the intervocalic morpheme boundary), it functions as a boundary signal (we will interpret it as a manifestation of diaereme). We see, then, that the same phonetic sound—a segmental sound—acquires different functions in different languages and it does not make much sense to classify it *a priori* phonologically as a segmental (a phoneme, a feature) if it can function as a suprasegmental.

Since there are other areas where the phonetic distinction *segmental* vs. *suprasegmental* does not match with functional evaluation of certain facts (see Martinet 1949: 11), it is advisable to drop this distinction in phonology. Or better: in phonology classifications of entities should be arrived at on the basis of the functional principle, not merely from the phonic substance of those entities (cf. Martinet *op. cit.*: 10, Martinet 1965a: 141-2, Mulder 1968: 209).

To avoid this Mulder introduced *para-phonotactics* (but Trubetzkoyan *prosody* or American *suprasegmentals* would do as well IF PROPERLY DEFINED). Para-phonotactic features are defined as "features corresponding to [phonological form], accompanying, but not determining the identity of [phonotactic] entities" (Mulder 1989: 451, cf. also Mulder & Hervey 1980: 149-50). Phonological form is of course a set of phonemes which are grouped into phonotactic entities which are usually syllables. Para-phonotactic entities are as if superimposed on the phonotactic entities. They are merely additional features, since they do not exist without phonotactic entities which provide bases for them.

Accent (certain functional prominence) is a typical para-phonotactic feature. Its phonotactic base is usually a syllable and its domain (i.e. an extension of phonological form) is so-called *accentual unit*—a phonological form of word in many languages. Another para-phonotactic features are tones or tonemes. They are comparable to phonemes, since they are mutually opposable. Their base is also a syllable in many languages. Yet another para-phonotactic entity is diaereme (or juncture) whose base is generally a phonological form of a

word—it accompanies the word so that it determines its boundaries. Both accent and diaereme will be deal with *in extenso* in chapters 3 and 4.

2.8 Formalization

We said that an allomorph was an instance of a morpheme (moneme/sign) and it could be expressed as $p^i \mathrm{R} d^i$. The distinctive function (d^i) in this case is a certain semantic function. A phonological form (p^i) is a set of positions $P_x ... P_{x+n}$ where phonemes can stand. Let us postulate another allomorph $p^j \mathrm{R} d^j$ not identical with the former (for the sake of simplicity we will work with two allomorphs but it does NOT mean we are operating in binary terms!). The phonological form p^j is a set of phonemes in positions $P_y .. P_{y+n}$. Now the relation between the phonemes in the phonological forms is the syntagmatic relation (for convenience symbolized '+'), sc. an ordered relation of inclusivity:

$$p^i = \{P_x + P_{x+1} + P_{x+2} + \ldots + P_{x+n}\}$$

$$p^j = \{P_y + P_{y+1} + P_{y+2} + \ldots + P_{y+n}\}$$

The allomorphs are then, respectively:

$$p^i \mathrm{R} d^i = \{P_x + P_{x+1} + P_{x+2} + \ldots + P_{x+n}\} \mathrm{R}\ d^i$$

$$p^j \mathrm{R} d^j = \{P_y + P_{y+1} + P_{y+2} + \ldots + P_{y+n}\} \mathrm{R}\ d^j$$

Commutative opposition is such a relation between two (or more) phonemes if commutation ('↔') between them brings about ('→') commutation between distinctive (semantic) functions:

$$(P_x \leftrightarrow P_y) \rightarrow (d^i \leftrightarrow d^j)$$

The distinctive function of a phoneme (that is, distinctive function in phonology as opposed to distinctive (semantic) function is grammar) is a sum of commutative oppositions (here symbolized '÷') it enters into (cf. Mulder 1968: 24). Hence (R here means 'belonging to'):

$$d^i \mathrm{R} P_x = P_x \div P_y \ (\div P_z \text{ etc.})$$

A necessary condition for commutation is the same (or as similar as possible) syntagmatic context. Therefore it should be that $P_{x+1} = P_{y+1}$ etc. and $P_{x-1} = P_{y-1}$. It will be clear from the example below.

Contrast is functional syntagmatic difference. The contrastive function (c^i) of a phoneme is also a sum of contrasts (symbolized '×') it enters into:

$$c^i \mathrm{R} P_x = P_x \times P_{x+1} \times P_{x+2} \ldots P_{x+n}$$

As an example we can give English words *pin*, *tin*, *sin* and get:

/pin/ = {/p/ + /i/ + /n/}

i.e. $p^i = \{P_x + P_{x+1} + P_{x+2} + \ldots + P_{x+n}\}$

/tin/ = {/t/ + /i/ + /n/}

i.e. $p^{j} = \{P_{y} + P_{y+1} + P_{y+2} + \ldots + P_{y+n}\}$

/pin/ R "pin" = {/p/ + /i/ + /n/} R "pin"

i.e. $p^{i}\mathrm{R}d^{i} = \{P_{x} + P_{x+1} + P_{x+2} + \ldots + P_{x+n}\}$ R d^{i}

/tin/ R "tin" = {/t/ + /i/ + /n/} R "tin"

i.e. $p^{j}\mathrm{R}d^{j} = \{P_{y} + P_{y+1} + P_{y+2} + \ldots + P_{y+n}\}$ R d^{j}

(/p/ ↔ /t/) → ("pin" ↔ "tin")

i.e. $(P_{x} \leftrightarrow P_{y}) \rightarrow (d^{i} \leftrightarrow d^{j})$

d^{i}R/p/ = /p/ ÷ /t/ (÷ /s/ etc.)

i.e. $d^{i}\mathrm{R}P_{x} = P_{x} \div P_{y}$ ($\div P_{z}$ etc.)

c^{i}R/p/ = /p/ × /i/ × /n/

i.e. $c^{i}\mathrm{R}P_{x} = P_{x} \times P_{x+1} \times P_{x+2} \ldots P_{x+n}$

3 ACCENT

3.1 Functional view of accent

When we spoke about culminative function, we mentioned a phonological unit *accent*. In the frame of functional phonology accent is viewed as a unit that probably always conveys a culminative function. We may even say that accent is a phonological unit whose inherent function is culminative function.

Before we proceed to the definition of accent, it is necessary to make clear from the outset that functionalists, firstly, distinguish between accent and stress (these are sometimes treated as synonyms). Accent is a phonological unit, a certain model, and stress (i.e. certain prominence of force or intensity) is just one way accent can be manifested in a language. Secondly, accent should not be understood as a certain type or style of pronunciation, that is, accent in functional phonology is not the same thing as e.g. American accent, which is a way English is spoken in America.

The functional view of accent goes down at least to Trubetzkoy who spoke about *correlation of accent* (*Betonungskorrelation*, Trubetzkoy 1939: 130). In fact, he was one of the first who distinguished between different functions of the phonic substance, and culminative function was one of them. Accent is a phonological unit whose function is culminative prominence. Since Martinet is a true follower and further elaborator of Trubetzkoy's functional phonology, he naturally touched upon the problem of accent. A long account on it (accent as differentiated from tones—to be explained in 3.7) was given in a paper "Accent et tons" (in 2nd facsimile of *Miscellanea Phonetica*, 1954, pp. 13-24), later reprinted after a considerable revision in Martinet 1965a: 141-61.

Accent is usually defined as bringing up into prominence one and only one syllable within an accentual unit (cf. Martinet [1960] 1991, 3.31). This definition is followed by Akamatsu (see e.g. Akamatsu 1992a: 112ff.) and is essentially identical with what Jakobson and Halle call *stress* as a configurative, namely culminative feature (Jakobson & Halle 1956: 24), though these linguists are at the borderline between functionalism and non-functionalism.

The view of accent as certain prominence is not peculiar to functionalists only; linguists in general are aware of the special role of accent/stress in utterances (cf. e.g. Ebeling 1968, Šaumjan 1968: 74-93). Curiously enough, a view in some aspects very close to the functional view of accent was shared by Noam Chomsky, Morris Halle and Fred Lukoff (Chomsky et al. 1956). Unlike other American (Post-Bloomfieldian linguists) they do not dis-

tinguish between several phonological degrees of stress but spoke about—what they call—an opposition of accent (p. 65). Depending on the distribution of juncture and accent, an English utterance can be realized with several types of stresses whose distribution is wholly governed by juncture and accent. He may see here an influence of Roman Jakobson with whom Morris Halle cooperated. What is more, the article was printed in a festschrift for Jakobson, a thing that later generative linguists found striking (cf. Scheer 2006a).

Literature: on the functional view of accent see Trubetzkoy 1939: 185-94, Jakobson & Halle 1956: 22-5, Martinet 1965a: 141-61, Martinet [1960] 1991, 3.31-3.36, Mulder 1968: 67-70, 209-11, Akamatsu 1992a: 110-28, Akamatsu 2000: 239-91 (analysis of accent in Japanese).

3.2 Definition of accent

Martinet defines accent as "la mise en valeur d'une syllabe et d'une seule dans ce que représente, dans une langue déterminée, l'unité accentuelle" (Martinet [1960] 1991, 3.31). This is a substance-based definition of accent. A more formal definition was put forth by Mulder; he views accent as a contrastive para-phonotactic feature. The latter concept is defined as a para-phonotactic feature "with the function of groupment over and above [phonotactic] groupment" (Mulder 1989: 451, cf. Mulder & Hervey 1980: 53). Among these features Mulder places also juncture (our diaereme) and notes "[j]uncture, especially when not always realised by 'pause', is frequently a function of accent" (Mulder & Hervey 1980: 53, see also Mulder 1968: 69-70). On the relation between accent and diaereme (juncture) see 4.3 and Bičan forthcoming, here pp. 86ff.

If we project Martinet's and Mulder's definitions into our terminological and theoretical frame, we can define accent as A CULMINATIVE PARA-PHONOTACTIC FEATURE ATTACHED TO ONE AND ONLY ONE ACCENTUABLE UNIT WITHIN AN ACCENTUAL UNIT. What is an accentuable unit will be discussed in the subsequent section; it is generally a syllable but it may also be a moraic unit. Accent is manifested by certain phonic prominence laid upon the syllable which is, within the accentual unit, in contrast with other syllables that do not exhibit such functional prominence.

As a preliminary note we may say that an accentual unit may be a phonological form of a morpheme/moneme, word or phrase (cf. Akamatsu 2000: 239) but its extension cannot be precisely set by some definition, since it differs from one language to another. What is important is that an accentual unit must contain at least two syllables. This prerequisite is a conse-

quence of the fact that the notion of accent is derived from the syntagmatic relation of contrast. What is also important is that the accentual unit is a phonological form of a certain significant unit and that usually only one accent appears within the phonological form, though they may be exceptions. The issue of the accentual unit will be addressed in a separate section (3.6).

Though it is ruled out by its very definition, it should be said that accent is not and cannot be a distinctive phonological unit (i.e. is not endowed with distinctive function), because it does not enter into any opposition with other units. This point is, unfortunately, gravely misunderstood and misinterpreted. It will, too, be addressed in a separate section (3.4).

3.3 Accentuable unit

It is obvious that our definition of accent differs a little from Martinet's, since it incorporates the notion of accentuable unit. The notion was, however, not unfamiliar to Martinet. Since accent is connected with the syllable in many languages, Martinet generally talked about a syllable being the domain of accent. But a syllable is only one type of accentuable unit.

The term *accentuable unit* was introduced by Tsutomu Akamatsu in Akamatsu 1997 and later re-used in Akamatsu 2000: 239-40, 243-4 to account for the nature of accent in Japanese where the domain of accent is not a syllable but what the author called *moraic unit*. For many linguists this term would evoke the concept of *mora*. Indeed, linguists are well aware of a distinction between syllables and morae, and distinguish between syllable-counting languages and mora-counting ones (cf. Trubetzkoy 1939: 169ff.). The concept of moraic unit is in fact based on mora, which is viewed as a unit of length (Akamatsu 2000: 219). The moraic unit for Japanese is defined as "a segmental structure that takes a mora for it to be pronounced, whether the segmental structure consists of a single segment (a vowel, a consonant) or a sequence of segments (any type of segments)" (*ibid*.). This definition is a phonetic characterization of the moraic unit rather than a phonological one, but in the course of the cited work Akamatsu operates with the unit from the latter view. As an example may be mentioned Japanese [to-ˈo-k'o-o] /toˈok'oo/ "*Tôkyô*, present-day capital of Japan" ([ˈ] indicates rise in pitch in the following segments) which contains TWO syllables but is built up of FOUR moraic units: [to] /to/, [o] /o/, [k'o] /k'o/ and [o] /o/ (Akamatsu 2000: 243). Each of the moraic units can potentially bear accent. In Japanese it is a moraic unit (not a syllable) that is the carrier of accent.

Although the concept of mora is well-known, Martinet registers certain problems with the distinction between syllable- and mora-counting languages (Martinet 1949: 16-8). We will therefore not go deeper in the concept of mora and/or moraic unit not to wander to much astray from the point of this section.

For us, important is not the precise nature of morae or moraic units on the one hand and syllables on the other, but the fact that accent *qua* a para-phonotactic feature may be attached to different types of phonotactic units (and speaking of which, even the structure of the syllable is different for one language to another). To account for this fact Akamatsu introduced *accentuable unit*, sc. a unit that is capable of being accented. This is perhaps a little bit unfortunate, since the definition is likely to be circular.

Martinet, who distinguishes between phonemics and prosody, speaks about *minimal prosodical sections* (Martinet 1949: 12, 17). The mentioned distinction goes down to Trubetzkoy who spoke about *prosodemes* (Trubetzkoy 1939: 179). This term would be acceptable, had we not rejected the distinction between phonemics and prosody on the phonic basis. Also, the term may suggest that a syllable or a mora(ic unit) is a prosodic (para-phonotactic) entity, which is not. It is a phonotactic entity capable of carrying para-phonotactic features.

This leads us to the terminology and theory of Mulder's which has so far proven very apt. We should mention here that there are, besides accent, other para-phonotactic features, tonemes or tones (on which see 3.7). That these are distinctive whereas accent is contrastive is not so much of importance as the fact that they are, too, in need for being attached to a phonotactic unit. In many languages it is a syllable which carries tones but in other languages it may be preferable to operate with a mora (or a moraic unit). What we want to say is that there should be a distinction between phonotactic units providing bases for para-phonotactic features on the one hand, and para-phonotactic features being in need for bases without which they could not exist. Mulder makes such a distinction in his *Postulates* but since he seeks for the greatest generality, he does not make any special difference between para-phonotactic and para-syntactic (i.e. tactic in grammar) entities and features. As we are focusing here on phonology only, we will adapt Mulder's definitions accordingly (see Mulder 1989: 452).

> Def.: *para-phonotactic entities* for 'phonotactic entities or conglomeration of phonotactic entities, together with accompanying para-phonotactic features, such that the whole assumes an identity on a level different from the phonotactic level'; alternative definition: 'entity constituted by a base and para-phonotactic features'.

Def.: *base* for 'in a para-phonotactic entity, the total complex of those features that correspond (on another level) to phonotactic entities' (note that on the sentential level, the sentence is constituted by a base and para-syntactic features (intonation)).

To incorporate these definitions into our framework, the following should be said: accent and tonemes are para-phonotactic features. Since they cannot acquire, so to speak, independent existence, they have to be attached to phonotactic entities. In short, there has to be a phonotactic unit (as a rule, a complex of phonemes) which functions as a BASE for para-phonotactic features. The base is what, in the case of accent, Akamatsu called *accentual unit*. In general, it is Martinet's *minimal prosodical section* or Trubetzkoy's *prosodeme*. A para-phonotactic entity is then a phonotactic base together with para-phonotactic features. In the case of accent, it is an accented syllable or moraic unit. However, one should realize that a syllable (or a moraic unit) that is not accented is also a para-phonotactic entity, though it does not in fact contains an accent. It is the absence of the accent that is functional here. Were it not, the accented syllable could not be contrasted to unaccented ones by which the very requisite for functionality of accent (and contrast) be violated.

Now, there naturally rises a question by what term we should refer to the concept we have dealt with in this section. Despite the intentional limited scope of this paper, it is obvious that our terminological and theoretical apparatus should account for both the bases for accent and the bases for tonemes. In this light the term *accentuable unit* is not satisfactory, as it refers to accents only. Problems with *prosodeme* and *prosodical sections* have already been mentioned (not to mentioned that other linguists use it differently than Trubetzkoy, see Haugen 1949 or Hill 1961). Mulder's term *base* appears then to be most satisfactory. Since we deal with phonology in this paper, we propose to use PHONOTACTIC BASE as a general term for such a phonotactic unit providing the domain for para-phonotactic features. Furthermore, we propose to retain ACCENTUABLE UNIT as a type of phonotactic bases which provide the domain for accent. In turn, SYLLABLES and MORAIC UNITS are two types of accentuable units.

3.4 Functions of accent

In the course of previous section we repeatedly mentioned that accent had culminative function. It should be reminded that Martinet and Akamatsu speak about the contrastive function of accent. We defined culminative function as a special type of contrastive function. In our framework accent of course has contrastive function, too, since the culminative function as defined here presupposed the contrastive function.

That accent has contrastive function is derived from the syntagmatic relation of contrast (just as the distinctive function is derived from the paradigmatic relation of opposition). The accented syllable, as a syllable enhanced with certain prominence, is contrasted to the unaccented ones within an accentual unit (which is a kind of phonotactic construction). However, this simple contrastive function does not mean much by itself. What is important is that, by virtue of accentual prominence, the accentual unit is contrasted to other accentual/significant units. This implies that the number of accented syllables corresponds to the minimal number of accentual units within an utterance; hence it corresponds generally to the number of significant units (usually words) within an utterance.

Let us illustrate it on an example from Czech. Let it be noted that throughout this paper examples will be given from standard present-day Czech, English and other languages unless indicated otherwise. We will use national phonetic transcriptions rather than giving a strict IPA transcription (IPA does not quite suite Czech, actually). Vowels in bold face show accentual prominence.

Včera mě strašně bolela hlava. [fč**e**ramňestr**a**šněb**o**lelaɦl**a**va] "Yesterday my head was terribly aching"

We see that certain phonic prominence is attached to the first syllables of phonological forms of words *včera* "yesterday", *strašně* "terribly", *bolela* "was aching" and *hlava* "head". The monosyllabic word *mě* "me (acc.)", which is an enclitic, is not accented here; it forms an accentual unit with *včera*. In many languages there are words which are not usually accented and which adjoin the antecedent or subsequent words to form an accentual unit with them. Even despite this, we can see that the number of peaks of prominence in the utterance equals roughly the number of words used there. In fact, accent usually indicates the lowest possible number of significant units (words) in an utterance.

There is one important question about accent that has to be addressed: Can accent be distinctive in a language? Many linguists would most likely answer in affirmative but not functionalists. Accent can be distinctive in NO language or better: accent CANNOT be distinctive in any language. It is by definition impossible. Being distinctive means being opposable to something else but accent is not opposed to anything; it is not in the paradigmatic relation of opposition (distinctive function being derived, indeed ultimately based on the notion of opposition) with anything else. An obvious objection would be the fact that e.g. English has pairs of words like *insult* (noun, accented on the first syllable) and *insult* (verb, accented on the second syllable) and that there is a difference in the way they are accented. However, it is not accent that is distinctive here but THE PLACEMENT OF THE ACCENT! We speak here about *placement*, not about *position*, because we defined the latter as an intersection of the paradig-

matic and syntagmatic axis. The point where accent is placed is not a position in this sense (in Bičan forthcoming we use *position of accent*, it should be understood as *placement of accent*, though).

One may argue that there is nevertheless an opposition, because even though a syllable is either accented or unaccented, the absence of accent is as phonologically relevant as its presence. While it is true that the absence of something can be interpreted as functionally relevant (e.g. the absence of voice in voiceless consonants), it is not the case here. To show this, we will suppose the opposite, sc. that accent is after all distinctive and hence the presence of accent is opposed to the absence of accent.

Let us take the English word *insult*. Suppose that accent is present on the first syllable (it is therefore a noun). Then the other syllable is necessarily unaccented, therefore in our terms it shows the absence of accent. But it also means that the absence of accent is predetermined by the presence of accent in the first syllable, which implies that the absence of accent in the second syllable is not opposed to the presence of accent! Alternatively, we can suppose that accent is absent in the first syllable (the word is therefore a verb). Accent is then necessarily present in the second syllable and again the presence is dependent on the absence is the first syllable; there is again no opposition in the second one.

However, the same line of thinking can be applied on the analysis from the point of view of the second syllable. We may start supposing that in the second syllable accent is distinctive and hence the presence of accent is opposed to the absence here. If accent is present and therefore the word is a verb, it is absent in the first syllable—there is no choice and no opposition between the presence and absence of accent in that syllable. Or, if accent in absent in the second syllable, it is necessarily present in the first and again its presence vs. absence is dependent on the second syllable.

We see that we can analyze the words from two perspectives. First of all, we are not able to determine objectively which of the analyses is to be preferred, but what is more, either leads to awkward solutions. The point is that NEITHER analysis is a sound one: it is erroneous to suppose an opposition between the presence vs. absence of accent, because there is no such one. Accent is not an oppositive unit; it does not enter into any paradigmatic relation with anything else. It is a contrastive unit tied to a certain syllable, which is in turn in a syntagmatic relation with other syllables lacking the accent. It is the placement of the accent that is distinctive, and it is distinctive, because one accentual pattern is opposed to another. In the case of *insult* it is the accentutal pattern "accented-unaccented" that is opposed to "unaccented-accented". For more on this see Martinet [1960] 1991, 3.33, Akamatsu 1992a: 121-7,

Akamatsu 2000: 241, for agreement in this point by a non-functionalist see, for example, Jones 1950, §§ 341, 429, 453, 455, 462, 469.

Since the erroneous view of the distinctive accent is widely spread among linguists, let us explain it once again, this time in symbols. The noun *insult* consists of two syllables S_1 and S_2, the first of which is accented (here in bold). The verb *insult* contains the same syllables (i.e. the same phonotactic configuration); only the para-phonotactic configuration is different. Hence:

insult noun **S_1** S_2

insult verb S_1 **S_2**

Since in the noun the first syllable is accented, the other is necessarily unaccented. Likewise, since the verb is accented on the second syllable, the first is not accented. In other words, the phonotactic construction /insalt/ cannot receive the following accentual patterns in English (both accented, both unaccented). This is not because the construction would be somehow defective; it is not possible for any other comparable construction. So the impossible patterns are:

S_1 S_2

S_1 S_2

Now that we have patterns **S_1** S_2 (noun) and S_1 **S_2** (verb) but not **S_1 S_2**, S_1 S_2, we should see that we cannot possibly say that **S_1** of *insult* (n.) is opposed to S_1 of *insult* (v.), since the second syllable of the verb is **S_2** not S_2 and *vice versa*. The context for comparison (commutation) is not identical. In 2.8 we gave the following formula for the distinctive function ('÷' stands for 'opposed to'):

$d^{i}\mathrm{R}P_x = P_x \div P_y$ ($\div P_z$ etc.)

We said that a condition that should be met is that $P_{x+1} = P_{y+1}$ and $P_{x-1} = P_{y-1}$ or ideally that $P_{x+n} = P_{y+n}$ and $P_{x-n} = P_{y-n}$. In plain words this means that the circumscribing context should be maximally identical. Speaking in terms of phonemes, we compare *pin* with *tin*, *sin* etc., not with *tan*, *sun* or *stance* or the like. We compare in the same context. This condition is not met in the case of the *insult* pair. Therefore we cannot speak about commutation or a commutative opposition and the distinctive function is out of question.

Yet there can be no doubt that the words *insult* (n.) and *insult* (v.) are different. The difference, however, is not underlain by the accent *per se* but by its presence on a certain syllable. In other words, the placement of the accent is distinctive. The distinctiveness of the placement is ensured by the existence of a functional paradigmatic difference between two accentual patterns **S_1** S_2, which may be called Pattern 1, and S_1 **S_2**, called Pattern 2. The

choice between Pattern 1 and Pattern 2 for the phonotactic construction /insalt/ is what underlies the distinctiveness.

It should be noted here that functional phonology operates with the concept of neutralization. An opposition which is operative in certain contexts (the context(s) of relevance) may be inoperative and hence neutralized elsewhere (the context(s) of neutralization). The distinctive unit standing in the context of neutralization is an archiphoneme or architoneme (for the neutralization between tonemes). Since there is an opposition between accentual patterns, there may be in principle neutralization of such an opposition. Likewise, there may be an archi-pattern as a result of the neutralization. In fact, a description of neutralization of accentual patterns is well described for Japanese in Akamatsu 2000: 256-62.

The distinctive placement of accent is thinkable only in languages with a free accent. In a language with a fixed accent, sc. in a language where the accent is structurally fixed to a certain syllable (or moraic unit) within an accentual unit, the placement of the accent cannot be distinctive. This is because the phonotactic configuration of a phonological form of a certain significant unit allows for one and only one accentual pattern. In fact, we should not speak here about a pattern at all, certainly not in the sense the notion *pattern* was conceived in previous paragraphs, that is, for languages with a free accent. In these languages one accentual pattern is opposed on other pattern(s) (e.g. $\mathbf{S_1}$ S_2 to S_1 $\mathbf{S_2}$) but in languages with a fixed accent no such opposition takes place.

Czech may serve as an example. It is an oft-cited language with a fixed accent. In this language only one accentual configuration (not pattern) is structurally possible for dissyllabic words: $\mathbf{S_1}$ S_2. This means that every dissyllabic word (actually, all plurisyllabic words in isolation) is accented on the first syllable. Unlike in English, in Czech the configuration $\mathbf{S_1}$ S_2 is not opposed to any other configuration hence it is not distinctive. We say that in Czech the placement of accent is not distinctive (it MAY be distinctive under certain circumstances, see Bičan forthcoming *sub* f, here pp. 93).

Yet the fixed accent (in Czech as well as in other languages) has the inherent function of accent—culminative function: accent functions as the culminative peak within a phonological form.

Thanks to the structural fixation of the placement of accent, it may acquire another function: deliminative function. In many languages that have a fixed accent, its placement may help the listener locate boundaries of significant units, since the placement of the accented syllable is, as a rule, relative either to the beginning or end of a phonological form of a significant unit.

Czech is one of such languages, because every plurisyllabic word in isolation is accented on the first syllable. The condition *in isolation* has to be added, since a word may lose its accent under certain circumstances. One of these is a situation when a noun is governed by a preposition. Consider these examples:

pod [pot] "under"

oknem [**o**knem] "(through) a window (instr.)"

pod oknem [p**o**doknem] or [p**o**tʔoknem] "under a window"

The same potential for delimitative function of accent probably applies to all languages with accent fixed on a certain syllable. In Czech, Icelandic, Hungarian etc. (Martinet 1949: 12) it is the first one. In Turkish it is the last one (*ibid*.). In Polish it is the penultimate one. In this language the grammatical boundary lies somewhere behind the first unaccented syllable after the accented one. Martinet (1965a: 154-5) mentions that the accent in Polish fulfills a function of "démarcation imparfaite" as contrasted with the accent in Czech which fulfills "démarcation parfaite". What Martinet wants to say by this is the fact that in Czech (and Turkish) the accented syllable is the syllable immediately adjacent to the grammatical boundary but in Polish the accented syllable is not immediately following or preceding the boundary, which may cause certain ambiguities (in principle, of course, in practice users of Polish are aware of boundaries due to their overall knowledge of the language).

A similar situation is in Latin which has also a fixed accent but the placement of the accent is not as straightforward as in Czech. If in the latter language the relation between the accented syllable and the beginning of a word was direct (the first syllable after the beginning of a word is the accented one), in Latin the relation is indirect, as it is dependent on the quality of the penultimate syllable in words with three or more syllables. If the syllable is 'heavy', it is accented. If it is not, the accented syllable is the antepenult. If we have, for instance, an utterance [b**o**nakal**i**gula], it would be only the lexemic knowledge of Latin by which the listener could decompose it as *bona caligula* and not as *bonaca ligula* (cf. Martinet [1960] 1991, 3.36).

The same situation is in Polish (cf. Martinet 1965a: 154). Yet it should be noted that the deliminative function of accent is even in Czech or Turkish somewhat approximate, since it points to the place of the accented syllable respective to the boundary (in Czech to the first syllable after a word boundary) but the precise boundary should be indicated by other means—by diaereme (on this cf. also Hyman 1978: 449). In other words, the accent itself does not govern syllabification but the diaereme can. In many languages diaereme functions as a marked syllable boundary.

3.5 Secondary and n-nary accents

There is one aspect of accent that is particularly peculiar to Martinet's theory: he maintains that if there is accent in a language, there is only one accent—the accent. This will naturally strike as contradictory to anyone familiar with other phonological theories which casually operate with secondary, tertiary and n-nary accents (however, the view is also shared by Chomsky et al. 1956, by Antonsen 1966 or Hyman 1978, to give an example of agreement by non-functionalists). There is no such thing in functional phonology. The argument will be again shown on Czech.

Kučera (1961: 52-7) operates with four distinct phonological levels of stress of Czech: overloud stress, loud stress, medial stress and weak stress. This statement would, however, makes sense only if we replaced *phonological* by *phonetic*, since phonologically the situation is quite different. Kučera's *loud stress* is a kind of stress or accent (or better prominence, see below) which is distinct from the accent we are dealing with in here; it is what might be called *connotative stress*/*accent* (in Czech usually *důraz*) but the latter has to be distinguished from the former. In terms of semantics, accent—the accent—is one of denotation while the connotative stress/accent is one of connotation (Mulder & Hervey 1980: 53, Mulder 1989: 381). At any rate, Czech does not have, PHONOLOGICALLY, medial and weak stress. Though Kučera (*op*. *cit*.: 53) gives as an example of contrast (in his terminology synonymous with *opposition*) the following pair, it does not actually show any (commutative) opposition at all (in his notation ['] is loud stress, [,] is medial and weak stress is unmarked).

[,ta'jemna:'da:ma] "that fine lady", spelled *ta jemná dáma*

['tajemna:'da:ma] "a mysterious lady", spelled *tajemná dáma*

A quick comparison of the examples will reveal why there is no commutative opposition: the particular contexts are not functionally equal. We spent a good portion of the previous section for demonstrating this; the situation is comparable to the *import* (n.) vs. *import* (v.) problem. But even if we ignored this—in fact we should NOT ignore it—the example still does not exhibit an opposition of loud and medial stress. The first item [,ta'jemna:'da:ma] is a three-word utterance whereas the second item contains only two words. There is a grammatical boundary between [,ta] and ['jemna:]. The boundary is signaled by the presence of diaereme which is in this case co-occurrent with accent (loud stress). One may even say that the boundary is signaled by potentiality of a pause being inserted in-between. At any rate, Kučera confuses the phenomenon of accent (stress) with the phenomenon with diaereme. There are no convincing examples of accent having several distinct phonological levels in Czech (we

will return to yet another example in 3.6 and on the alleged distinctiveness of diaereme in 4.6).

The secondary accents (and n-nary accents in general) do not have a phonological function in the narrow sense. Their function is generally rhythmical: they usually occur at every second syllable after the accented one as to create a certain rhythmical pattern peculiar to every language. In Czech it is usually every odd syllable from the beginning that is so rhythmically prominent (Krčmová 2001: 47). It is not accented in the phonological-functional sense.

The problem with n-nary accents stems, from a considerable degree, from terminology. First, the words *accent* and *stress* are by many linguists used synonymously. Second, the words are used both in a functional (phonological) sense and in a realizational sense. That is to say, one time *accent* or *stress* is used for a phonological entity, another time for the way this entity is manifested. In order to clear things up we propose the following distinctions:

> Def.: *prominence* for 'a certain articulatory discrimination (i.e. difference) of a certain portion of speech as contrasted with other portions' (the prominent portion is usually a syllable).
>
> Def. *accent* for 'prominence that is functional' (this is of course the accent how we perceive it in functional phonology).
>
> Def.: *stress* for 'one of the means prominence is actually manifested' (other means may be pitch, loudness etc., more on this in 3.8).

With these definitions, especially with the distinction between *prominence* and *accent*, our account will be less confusing. We can now speak about accent—the accent—and primary, secondary and in general n-nary prominence. By n-nary prominence we will mean what others designate as n-nary accents or stresses. We will leave out *stress* at all, since it is a specific manifestation of prominence.

Languages can have and usually have several degrees of prominence. The primary or main prominence is as a rule most articulatorily marked (either by force, loudness, pitch, but once again these are concrete manifestations which differ from a language to a language). The secondary prominence and subsequent n-nary instances of prominence are usually less articulatorily marked and their markedness is dependent on and relative to the degree of markedness of the main prominence. For instance, the first syllable of Czech is most prominent. The third syllable (supposing there are more than two syllables) in line is less prominent; the fifth syllable is even less prominent. In general and in the ideal state, every odd syllable within an accentual unit (to be explained presently) is prominent; the degree of prominence decreases from the beginning to the end of the accentual unit in Czech.

3.6 Accentual unit

In many cases only the most marked prominence is a functional accent. However, in certain cases and certain languages subsidiary prominence, whose degree of the articulatory markedness is dependent on and relative to the main prominence, may be a functional accent, too. This accent, which may be called the SECOND, not secondary accent, belongs to another accentual unit. We defined accent as certain prominence within an accentual unit. Now is the time to explain what is meant by the accentual unit.

The definition of accentual unit is somewhat problematic. There is probably no better way than to define it as a certain extension of a phonological form which contains one and only one accent. But accent is defined within the scope of an accentual unit and so the definition is circular. In fact, the extension is not essential because it is language-specific and even within one language there may be various extensions. What is important is that only one accent occurs within an accentual unit. Another accent belongs to another accentual unit. And accent is an instance of prominence that is functional. The functional principle must, once again, play its role.

The extension of an accentual unit is implied from the nature of accent. Accent is functional and *functional* in language means being relevant to communication. Communication is mostly an exchange of meanings. Hence, for accent to be relevant for communication it must hold that it participates somehow in the exchange of meanings. For that reason accentual unit is a phonological form of a certain significant (meaningful) unit. The most natural accentual unit would be a phonological form of a word but particular languages can have other extensions.

From a typological point of view, languages can be classified according to the minimal extension of accentual unit. There are two basic minimal accentual units: word and morpheme (read: a phonological form of a word or of a morpheme).

Czech is a language where the minimal accentual unit is a word. This means that no extension smaller than a phonological form of a word can bear an accent. This is what is traditionally asserted in linguistic treatises but it may be that the minimal accentual unit in Czech is smaller than a word. Consider this example (taken from Krčmová 2001: 47-8; capitals in bold face represent the primary prominence, non-capitals in bold represent the secondary; the same holds for the examples below):

[svj**E**tobj**e**žňi:k] “globe-trotter”, spelled *světoběžník*

The structure of the word is nicely hinted by the English equivalent. It is obviously a composite but here we run at the problem of what is a word. So far we have taken the word in

an intuitive sense. Though this way is not quite acceptable it has been done so mostly for practical reasons. Going down and trying to solve the problem of word would be a topic for an independent work (cf. Hyman 1978). Martinet in fact rejected the notion of *word* (see Martinet [1960] 1991, 4.15-4.17) replacing it by notions of *moneme*, *syntheme* and *syntagm* (see also Martinet 1965b, Martinet 1967, Martinet 1968). Mulder in a way restored the notion in the form of *plereme* as the minimal syntagmatic unit of grammar—a counterpart of *phoneme* which is the minimal syntagmatic unit of phonology (see Mulder 1989: 443-4).

For the time being, we will leave the problem undecided. Yet we would like to mention two other items cited by Krčmová (*ibid*.):

[m**O**drof**i**jalova:] "blue with shades of violet", spelled *modrofialová*

[m**O**drof**I**jalova:] "blue and violet", spelled *modro-fialová*

The pair *modrofialová* and *modro-fialová* is quite of interest. Here the difference between the primary and secondary prominence is what distinguishes the items. A precise phonetic examination of these pair would be necessary. Yet most likely we come here across what we discussed in the case of Kučera's pair *ta jemná dáma* vs. *tajemná dáma*. The item *modro-fialová* should be interpreted as two words owing to the presence of functional primary prominence (i.e. accent) on *fi*. There is therefore a diaereme in between *modro* and *fialová*.

On the other hand, the item *modrofialová* is best interpreted as a one-word utterance containing two accentual units. The difference between *modrofialová* and *modro-fialová* would then be in the latter having an in-between diaereme.

The preceding discussion of the Czech accentual units was meant to show that setting the minimal extension of accentual unit need not be so straightforward. Although it is usually phonological form of a word, under certain circumstances it may be a unit smaller than the word. But this issue has yet to be considered in detail.

Other languages with the minimal accentual unit being a word are, *inter alia*, Polish, Classical Latin and Spanish (Martinet 1965a: 154). To the other group of languages where the accentual unit is smaller than a word belong Icelandic, Danish, Pekinese, German and English (*ibid*.).

There is one theoretical problem that has to be challenged. We said that there were two basic minimal accentual units, a word and a morpheme. The question that now rises is: what is the least number of accentuable units (syllables or moraic units) that the minimal accentual unit can have? For the sake of simplicity, we will operate only with syllables *qua* accentuable units. The question may be fancily dubbed as 'the controversy of monosyllables'. Is there something like a monosyllabic accentual unit?

In a previous section we already mentioned that an accentual unit had to be at least dissyllabic. It follows from the nature of accent: it is a contrastive unit, which means that it is a term of a contrast. A contrast, like an opposition, has to be postulated between at least two terms. A contrast is in fact a comparison on the syntagmatic axis. If there is only one entity, it cannot be well compared to anything else, as there is nothing else. An accentual unit has to contain by definition at least two accentuable units—syllables. One of the syllables is accented, the other or others are unaccented; a contrast is established between them.

Akamatsu 1992a can be justifiedly regarded as the best introduction to functional phonology. However, the author's account on accent (pp. 112-28) is unfortunately not always lucid; in fact it is sometimes rather ambiguous. This misfortune is an outcome of terminology. Akamatsu uses *accent* for both functional prominence (i.e. accent *per se*) and non-functional prominence. Although he tries to explain where the term is used for functional prominence and where for non-functional, confusion is still likely to rise.

The controversy in the mentioned treatise is also caused by the fact that nowhere Akamatsu explicitly says how many syllables an accentual unit must have. At one place it is stated that "[t]here need to be two or more syllables for contrast to be achieved through the accent" (*op. cit.*: 113) but just overleaf an English utterance *Run!* is said to consist "of only one syllable which, when used this way, is always accented without there being an unaccented syllable or syllables adjacent to it". This is contradictory. The English utterance *Run!*, even though it may exhibit certain phonic prominence, is not and cannot be BY DEFINITION accented. The prominence is not functional. First of all, it does not contrast with anything else (non-prominence). Secondly, the presence of the prominence hardly helps the listener in recognizing how many significant units the utterance has, since the utterance has just one significant unit and the listener is well aware of this, as he has not heard anything else.

Akamatsu (*op. cit.*: 114) mentions another example: an English sentence *Dan sang well*. According to him, "each monosyllabic word is accented, without there being an unaccented syllable or syllables adjacent to any of them". However, we deem that this statement would make sense only if *accented* were replaced by *prominent* (i.e. showing a prominence as we defined it). The whole sentence could form an accentual unit as a whole where the respective degree of prominence on each word would be mutually interdependent. Then there would be only one accentual unit (*Dan sang well* as a whole); but once again one entity does not enter into contrast. In other words, since *Dan sang well* forms only one accentual unit and since it is only one utterance (like *Run!* above), the listener would know that only once utterance was produced and the presence of prominence would add no further information as to the structure of the utterance. What is more, if all the words *Dan*, *sang* and *well* contained the

same degree of prominence, the situation would be same as if they did not contained any prominence. It is comparable to physics: processes in a certain environment come to pass in the same way irrespective of the environment being static or in movement of a certain constant speed.

We mentioned English. Indeed, English is a language where the minimal accentual unit is a phonological form of a morpheme. At the same time, English has many monosyllabic words. Many of these words seldom occur in isolation where, we maintain, they bear no accent. Yet monosyllables can be accented in combinations. The word *underlie* may serve as an example, with secondary prominence on the first syllable and primary on the third. The word contains two accentual units. Though the second one is in fact monosyllabic (*lie*), the contrast is achieved via the second, non-prominent and unaccented syllable. We see here that phonological forms of units smaller that a word (*under* and *lie*) are accentual units.

However, the situation is different to e.g. *mincepie*. Akamatsu (*op. cit.*: 117) says that it "consists of two accentual units". Yet on p. 120 he says that in *canteen* (which has the same prominence pattern, i.e. secondary prominence-primary prominence, as *mincepie*) "[i]t is impossible […] to see two separate accentual units". If both syllables in *mincepie* were functionally accented, there would not again be an unaccented syllable with which they could be contrasted.

Once again, we see here a controversy but we will leave this question undecided, as its solution requires a close examination. The aim of this paper is to give a theoretical account on different phonological phenomena (accent included) which may be a basis for further investigation. The problem is pertinent especially to English due to its monosyllabic nature. German has also the morpheme as the minimal accentual unit but here it results from the fact that the language favors many long composites. For instance, the word *Grundkreditanstalt* "mortgage bank" has three instances of accent (on the first, third and fourth syllable) and three accentual units which correspond not precisely to words (or a pleremes as the minimal syntactic units) but to morphemes.

To conclude this section, one final note is to be added. The prominence laid on certain syllables is generally associated with significant units. So, if a speaker wants to structure his utterance, he will prefer to use the prominence for highlighting meaningful sections of the utterance as to help the listener understand it. From this fact is derived the concept of accent as functional prominence. However, sometimes the prominence need not be associated with significant units at all. Examples are English *understanding* and *crucifixion*.

In *understanding* the first syllable shows secondary prominence; the primary prominence falls on the third syllable. The word is a complex of *understand* and *ing* but synchron-

ically and from the functional morphological point of view (see Mulder & Hervey 1980: 122-44 and Bičan ms.), the former (*understand*) is not any further complex—it is a simple sign like e.g. *cat*. Many would disagree but they confuse the sign-status with what things appear to be. The fact that *understanding* appears to be composed of *under* and *standing* does not mean that the meaning of *understanding* is the same as *under* + *standing* or *standing* + *under*. The argument that the composite nature of *understanding* is underlined by the prominence on the first and the third syllable is not very convincing, since the same prominence pattern has the word *crucifixion* which would then have to be decomposed to *cruci* and *fixion*, which analysts would no doubt like to preclude (this is tightly connected with the problem of so-called *cranberry morpheme* which we examine closely in Bičan ms.).

The theoretical status (i.e. the status in the language theory) should not be confused with what users of a language think and suppose. The latter is of course a fact that should be considered by linguists but at the same time it is a thing that is very hard to grasp and describe. Many people lay certain symbolism to sounds and words on the basis of similarity with other sounds, words or even real-life situations they experienced. This is oftentimes in contradiction with linguistic facts. So Englishmen, for instance, pronounce the name *Plato* as if it contained two words (see e.g. Chomsky et al. 1956: 74) but it does not mean it is two words. Germans pronounce *Theater* as if it was two words, too (see e.g. Mouton [1947] 1958: 214). Similarly, English speakers may highlight *understanding* and *crucifixion* by prominence as if these were two significant units but this does not mean that the words are composed the way they imagine.

Now as to how a linguist—a functionalist—should deal with this phenomenon is a thing to be considered, we will not attempt to resolve it here. Martinet (1965a: 145) considers the words *understanding* and *crucifixion* as containing two accentual units which, however, correspond to pseudo-significant units *under* and *standing*, and *cruci* and *fixtion*, respectively. Akamatsu (1992a: 118) is not decisive but seems to choose Martinet's solution.

> Literature: on accentual units see Martinet's article *Accent et tons* (Martinet 1965a: 141-61, in particular pp. 154-5), Martinet [1960] 1991, 3.31, 3.35, Martinet 1949: 13-5, Akamatsu 1992a: 112-21).

3.7 Accent and tonemes

So far we have mentioned the concept of tonemes on a very few occasions. This is because, like phonemes, tonemes are not the topic of our paper. Yet tonemes should be men-

tioned in a contradistinction with accent. Let it be noted that although we use the term *tonemes*, we could as well use *tones* instead (cf. Martinet's article *Accent et tons*). The choice of *tonemes* instead of *tones* is rather arbitrary (cf. Akamatsu 1992a: 43, n. 2). What matters is the value of terms but the terms themselves.

In chapter 2 we defined a toneme as a distinctive para-phonotactic unit. So both accent and tonemes are para-phonotactic but the difference is in the former being only a contrastive unit and the latter a distinctive unit. This equals to saying that accent enters only into contrasts while tonemes enter primarily into oppositions, though they can enter into contrasts, too. From these definitions it follows that, paradigmatically, there is only ONE accent but SEVERAL (two or more) tonemes. Let us once again stress that this follows from the theory and not from how different para-phonotactic (suprasegmental if you like) features are manifested in an actual language.

In the subsequent section we are going mention a few possible ways accent can be manifested but let us say here straightforwardly that accent is not necessarily bounded to manifest by certain phonic phenomena.

It is traditionally said that Swedish is a language which has two types of accents, Accent I and Accent II, that oppose one another. Similarly, the same can be claimed about Serbo-Croatian, Lithuanian or Classical Greek. However, all of these languages are tone languages (sc. languages with tonemes). Many people would not agree with this, since generally only languages of East Asia are regarded as tone languages (such as Chinese), but these people are, first, forgetting that we made a sharp theoretical distinction between accent and tonemes, and second, they are lying too much emphasis on the phonic substance on the expense of seeing how certain phonic phenomena really function. For that reason, for a tone language like Swedish we have to posit two tonemes, Toneme 1 and Toneme 2. Then the difference between words like *komma* "come" and *komma* "comma" is to be accounted as resulting from the opposition between Toneme 1 and Toneme 2.

Once again this is a terminological and theoretical distinction and not a distinction based on the phonic substance. For instance, that prominence lain upon moraic units in Japanese is manifested as pitch does not mean that Japanese is a tone language as many linguists assert (see Akamatsu 2000: 243). It is purely incidental that accent is manifested as pitch in the language. It is the function of the pitch that is to be sought for and in Japanese it functions as accent.

Literature: on accent vs. tone(me)s see Martinet 1965a: 141-61 (*Accent et tons*), Martinet [1960] 1991, 3.32, Mulder 1968: 210-1, Akamatsu 1992a: 127-8, Akamatsu

2000: 242-3, 327-8 n. 199; on tone(me)s in general see Martinet [1960] 1991, 3.26-3.30, Mulder 1968: 209-22, Mulder 1989: 271-4, Akamatsu 1992a: 43-6, 49-50, 97-109, 143-6, Akamatsu 1992b.

3.8 Manifestations of accent

There are many possible ways for accent to manifest (or realize). It is purely language-specific, though in general we can say that the accented syllable (or moraic unit) will be so phonically marked as to distinguish itself from the environment.

We mentioned that in Japanese accent is manifested as pitch. In other languages accent may be manifested by pitch, too. Pitch may be high or low (punctual) or melodic (moving). In 3.5 we defined stress as one of the means accent can be manifested. Stress is some kind of articulatory energy, an increase in intensity or loudness. Other possible manifestations are length (duration) and/or timbre. All of these can naturally combine and usually they do so.

In 1949: 11 Martinet mentions a hypothetical manifestation of accent. Suppose there existed a language where a syllable would be either fully nasalized (nasal or nasalized consonants would combine with nasalized vowels only) or fully non-nasalized (oral consonants combine with non-nasalized vowels). It should be obvious that nasality and non-nasality would be a characteristic pertinent to the whole syllable, not to particular constituting phonemes. Suppose further that within a word only one fully nasalized (or, for that matter, only fully non-nasalized) syllable could occur. Now, the function of the nasalized (or non-nasalized) syllable would be the same as the function of accent in other languages: an instance of nasalization would be equated with an instance of one word; another instance of nasalization in line would belong to another word, since only one instance of nasalization per word is allowed. The occurrence of nasalization would help in identifying meaningful constituents of an utterance. And if we supposed that the placement of nasalization would be a matter of variance, it would function as a free accent, too.

Though it is only a hypothetical example (but comparable examples could be no doubt found in real languages), it should have shown that the range of actual manifestations of accent may vary. A linguist should neither be confused by the enormous potential of human speech organs nor be blinded by for a long time established but unchallenged common dichotomies or aprioristic and universals-driven predilections or wishes. A linguist should seek for the structure of a language and for functions various speech phenomena fulfills in the language. This is what functional phonology stresses and advances.

Literature: on manifestations of accent in general see Martinet [1960] 1991, 3.31 and Akamatsu 1992a: 115; for actual manifestations see phonetic/phonological descriptions of particular languages.

4 DIAEREME

4.1 Preliminary terminological notes

The title of this chapter is little informative to linguists not familiar with the concept of diaereme as such. If *accent* is among widely used linguistic terms, *diaereme* does not have this potential. However, what is basically meant by the term is well known. Others call it *juncture* but there are reasons to be explained in 4.4 why we do not follow this usage. Yet diaereme or juncture is only one side of the problem that will be dealt with here. To be more general we should perhaps speak about *boundary signals*, a term which is also well known since Trubetzkoy's times. But boundary signals are just the other side of the problem. Both diaereme and boundary signals are connected—in fact interconnected—but while we want to give a theoretical account on diaereme, we will not deal with all boundary signals in particular.

To give an example: the distribution of certain phonemes (e.g. /h/ in English) is practically limited to the post-diaeremic (or post-junctural if you like) position and by virtue of this the phonemes are boundary signals. However, in this paper we will not be particularly interested in such phonemes *qua* boundary signals but in the way the boundaries are signaled (e.g. in English by the phoneme /h/) and how these boundaries can be phonologically accounted for (in English, *inter alia*, by specific distribution of the phoneme /h/).

Though the problem of boundary signals and the one of diaereme are mutually connected, there is a subtle difference between them. One can approach the problem from the point of view of boundary signals (as was done by Trubetzkoy and a few others) or from the point of diaereme (juncture) as was done by American linguists. In the present paper we intend to take the latter path. This is of course not to say that one approach is better than the other but only that latter course appears as more convenient for our purposes.

Yet we do not want to ignore the other course. But here we come across a terminological problem of how to account jointly for the problem of diaereme together with the problem of boundary signals. Since both phenomena refer to junctions of certain units (these generally being significant units, most usually words), we will employ the term *junction* for referring to the general problem before getting down to a discussion of the problem of diaereme. For additional notes on terminology see 4.4.

4.2 Historical and theoretical overview of the problem of junction

Though generally associated with so-called boundary signals (*Grenzsignale*) and/or juncture—concepts introduced in phonological theories of the 20th century, the problem of junction was not considered and studied in that century only. Like in many other linguistic areas, it is probably the ancient Indian grammarians who investigated the problem for the first time. In fact, the problem of junction is pertinent to Sanskrit, an old Indo-Aryan language of the grammarians, where (what we call) words are joined together to form one monolithic block of speech. It is no coincidence that the term *sandhi* referring to junctions of certain portions of speech (words, morphemes) was borrowed from Sanskrit and is used up to date by linguists. For more on the subject of sandhi see Allen 1962. Since this work is an excellent overview of this problem and contains numerous references to other works, we will not go any deeper into the problem.

In this section we will concentrate on the views of the linguists of the 20th century, because this is the century when modern phonology was developed. However, it does not mean that the problem had not considered since the times of the Sanskrit grammarians. The problem of word boundaries was, for instance, a topic a paper "Words, logic and grammar" by a British phonetician Henry Sweet as early as 1876 (the article was not available to us but see Gårding 1967: 6). Sweet was influenced by Sanskrit grammarians as can be witnessed from his *Primer of Phonetics* which "has an outline similar to that of the phonological part of a Sanskrit grammar" (*op. cit.*: *loc. cit.*). It consists of two parts, Analysis and Synthesis, the second of which is, according to Sweet, "the science of sound-joints or glides", "the grouping of sound into syllables" and "the divisions between these groups" (see Sweet 1890).

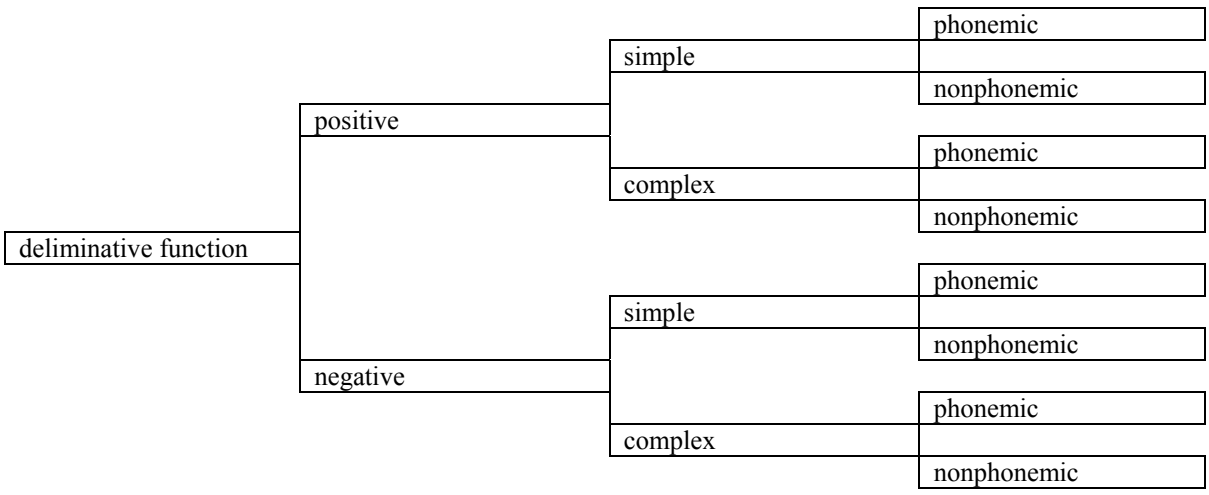
Another famous phonetician who considered the problem was Daniel Jones. Though not using the term, he compiled an impressive list of words and phrases differing in the placement of what became later known as *internal open juncture* (in Jones 1931, not available to us, see Lehiste 1960: 5-6). It was phrases such as *a name* vs. *an aim*; many of them became a matter of reference and a subject of investigation (see below).

Although probably the first modern phonological treatment can be found in Bloomfield 1933, the author does not discuss the problem in much detail. He notices the difference between words like *an aim* vs. *a name* (according to him, different in placement of stress) and mentions a glottal stop in German as a non-distinctive means for signaling boundaries (pp. 113-5) but that is virtually all he has to say to the problem.

It was Nikolai S. Trubetzkoy who presented—up to then and long after it—the longest exposure on the means grammatical units can signal their boundaries. It was a phenomenon that he called *Grenzsignale* (boundary signals; English terminology is taken from Trubetzkoy 1969). To the best of our knowledge, the problem was first exposed in print in Trubetzkoy 1935; it was also presented as a lecture on *The Second International Congress of Phonetic Sciences* in Cambridge, 1935, later published as Trubetzkoy 1936. The longest and final version is found in his *Grundzüge der Phonologie* (Trubetzkoy 1939), which, unfortunately, had to be published unfinished and without final revision. It will be the version upon which we will concentrate.

Trubetzkoy was without any doubt the most prominent functional phonologist at that time. His concern in phonology was directed on various functions of sound elements. We already mentioned his recognition of three basis functions of the phonic substance: distinctive function, culminative function and deliminative function. The first naturally gets most attention. The second is somewhat neglected but the whole second part of *Grundzüge* is devoted to the third. Unfortunately, this is the part of the book that was not finished. Trubetzkoy described in detail boundary signals of words (and units smaller than words) and seems to have intended to discuss boundary signals of sentences (see Foreword to the first German edition by the Prague Linguistic Circle).

Trubetzkoy discusses several types of boundary signals and classifies them according to several criteria. He distinguishes between simple and complex, phonemic and nonphonemic, and between positive and negative boundary signals. It may be conveniently reproduced in the following table (adapted from Anderson 1965):



Phonemic are such boundary signals that are achieved by phonemes. Phonemes have of course distinctive function but some of them may acquire deliminative function due to their

specific distribution (in word-initial or word-final position). Such a function has English /h/ which, a few exceptions aside (like *behave*), occurs only at morpheme boundaries.

Nonphonemic are such signals that are combinatory or positional variants of phonemes. In many languages certain phonemes are realized differently at grammatical boundaries than in contexts with no intervening boundary. This type of boundaries is in fact most known and most investigated. Trubetzkoy mentions Tamil occlusives that are aspirated word-initially (in Trubetzkoy's transcription p^h, t^h, k^h) but not word-medially. Aspiration is therefore a nonphonemic means for signaling boundaries. Trubetzkoy mentions many other examples, mostly from exotic languages but nonphonemic boundary signals can be probably found in every language. For instance, the difference between manifestations of /n/ in *an aim* and *a name* is also a nonphonemic boundary signal in English (in detail analyzed in Lehiste 1960).

Simple or individual boundary signals are those achieved by either single phonemes (in the case of phonemic signals) or single sounds (in the case of nonphonemic ones). This means that certain phoneme or sound combinations are permitted only across grammatical boundaries. Examples are e.g. French /õm/ in *on mange* "one eats" (phonemic; cf. Anderson 1965: 185) with a combination a nasalized vowel + a nasal which is not permitted word-medially, or Czech [r̥ʔa] in *Petr a Pavel* "Peter and Paul" (nonphonemic; cf. Vachek 1970: 964) with a sequence of a syllabic realization of /r/ combined with a vowel which is not permitted word-medially (the transition is probably always via a glottal stop). Another possibility may be a combination that is allowed only at the end or beginning of a boundary (e.g. English /smj/, occurring at the beginning of words only, cf. Trnka 1940: 225).

Finally, there is a distinction between positive and negative boundary signals. Positive are all that we have mentioned so far. These are the ones that indicate expressly where a word or morpheme boundary is. However, there may be signals, both simple and complex, and phonemic and nonphonemic, whose occurrence indicates that there is no boundary. In other words, the occurrence of such entities is limited to word- or morpheme-medial position with no surrounding boundary. We will not discuss these signals here, since they are in fact no boundary signals. It is questionable whether we should speak at all about boundary signals, since they rather signal non-boundaries (cf. Anderson 1965: 187). Cf. also a review by Zellig S. Harris on *Grenzsignale* vs. *juncture* ([1939] 1972: 304).

Although the discussion of Trubetzkoy's concept of boundary signals was sketchier than it deserves, it should be obvious that he does not operate with any type of phonological unit like juncture that would be responsible for different boundary signals. Trubetzkoy speaks only about the deliminative function that different phonemes or sounds or their combinations can have. Other linguists adopted Trubetzkoy's system and contributed to the division and

classification of boundary signals without employing any junctural phonological unit. See for instance Trnka 1940, Vachek 1968, Vachek 1970.

The approach that we described in the previous paragraphs may be conveniently called *path of boundary signals*. Now we will turn our attention to what may be called *path of juncture*.

The concept of juncture appeared for the first time in print in Trager & Bloch 1941 (see also Trager & Bloch 1942: 47), an article that has been since much referred to. The authors distinguish between several types of junctures: close juncture as "the transition of one segmental phoneme to the next within the utterance" (Trager & Bloch [1941] 1972: 73), and open juncture as "[t]he transition from the pause preceding an isolated utterance to the first segmental phoneme, and from the last segmental phoneme to the following pause" (*ibid*.). The authors point to the difference between the items like *tin-tax* vs. *syntax*, *night-rate* vs. *nitrate* etc., which is interpreted as the difference between open (*tin-tax*, *night-rate*) and close juncture (*syntax*, *nitrate*). The examples like *slyness*, *slowness* (with open juncture) led Trager and Bloch to set two types of open juncture (though they admit that further experimental data are needed): internal open juncture and external open juncture. The latter kind occurs before and after pause. However, there are examples of open juncture in words like *slyness* which show similar modifications of phonemes as the ones at pause boundaries, but where the pause would probably never occur. To answer for these phenomena, internal open juncture is posited (*op*. *cit*.: 74).

The internal open juncture and external open juncture are called juncture phonemes. This is a point that was criticized by both American and European linguists, though either had their own reasons. It was against the practice of the European linguists to set 'normal' phonemes like English /p, t, k/ as the same level with junctures (see Martinet 1949: 10, Vachek 1970, Mulder 1968: 69-70). American linguists called *phonemes* all distinctive and relevant phonological units (i.e. units that they regarded as distinctive, not distinctive as defined in the present paper). This view was advocated by Hockett ([1951] 1972: 312—review of Martinet 1949) but the appropriateness of such terminology is still doubtful.

There is another terminological problem with *juncture*: it is used in two ways (though not necessarily in Trager & Bloch 1941). First, it is meant as a type of junction between phonemic units; the distinction between open and close juncture is set. Second, the term *juncture* is used only for instances of open juncture. Though Trager and Bloch seem to have used the term for both open and close juncture, it is questionable whether they really regarded it as a phoneme (and whether it should be regarded as a phoneme in the American sense at all). At

any rate, it is a phoneme whose presence in phonemic transcription would never be explicit but always implicit, as close juncture between phonemes is never marked.

To avoid this terminological problem, Robert A. Hall, Jr. introduced the term *disjuncture* (in Hall 1946, Hall 1948a, see Trager 1962: 15) to refer only to instances of open juncture. The word *juncture* suggests connection of two or more things; *disjuncture* is in fact its antonym as it refers to disconnection of things. From the logical point of view, *disjuncture* is much more appropriate (cf. e.g. Vachek 1968: 9) but *juncture* is nevertheless a more common term. Other terms that were suggested for the phenomenon are *finalizer* by Benjamin L. Whorf (Whorf 1944-5), *schismeme* by W. E. Welmers (Welmers 1947) or *transition* by (see Trager 1962, in particular p. 15).

Just as much as Trager & Bloch 1941 was referred to, the article was also criticized (see e.g. Hauger & Twaddell 1942). The author also worked together on Trager & Bloch 1942 but Bloch later rejected the idea of juncture being phoneme or being a part of the phonemic system at all (Bloch [1948] 1972: 195). Trager, however, continued in using the concept and together with Henry Lee Smith he published another influential work, Trager & Smith 1951. In this work they consider a new aspect of the phonological structure of English: intonation and stress patterns. To account for different intonation contours in a sentence, the authors introduce three terminal junctures which, together with internal open juncture, form the system of English juncture phonemes. It was later followed by e.g. Gleason 1955: 42-6 or Hockett 1958: 54-61, though the terminal junctures were reinterpreted as clause terminals (Gleason) or terminal contours (Hockett); the term *juncture* (Gleason uses *transition*) was restricted to internal open juncture only, which became a common practice ever since. What is more, the difference between internal open juncture and external open juncture was questioned (but still used e.g. in Kučera 1961 for Czech).

Despite the criticism, the concept of juncture was found useful for descriptions of languages. An oft-cited example is William G. Mouton's article "Juncture in modern standard German" (Moulton 1947) where the author uses the juncture as a means for reducing the number of phonemes in German. In the language we can encounter the following pairs of words:

[ku:çən] *Kuhchen* "little cow"

[ku:xən] *Kuchen* "cake"

There are two possible solutions: either we could posit two different phonemes, /ç/ and /x/ which are opposed here, though otherwise the distribution of [ç] and [x] is complementary, or, as Moulton chose, the word *Kuhchen* should be interpreted as containing an in-between juncture. This solution was later criticized by Werner F. Leopold (1948), though the objections

were yet later dismissed by Ernst Pulgram (in 1970: 122-4, especially fn. 63; note the Pulgram rejects (dis)juncture and ascribes the difference to different syllabifications). Moulton returned to the question in Moulton 1962. In this work, which is rather a manual for teachers than a true scientific treatise, he accepts both solutions (pp. 22-3), though the analysis yielding two phonemes, /ç/ and /x/, is apparently preferred.

Besides German, English and Czech (the last in Kučera 1961) the idea of juncture was used for Spanish (Stockwell et al. 1956), Latin (Hill 1954) and other languages.

In the meantime, however, there were also theoretical discussions going on as to the nature of juncture. First, its phonemic (i.e. phonological) status was questioned. We already mentioned it was rejected by e.g. by Bloch (Bloch 1948). The idea of juncture as a phoneme was also disputed by Kenneth L. Pike (Pike 1947). It was then a current practice of analysts—in fact a contention of analysts (e.g. Moulton [1947] 1958: 241, fn. 14: "I believe that the phonemes of a language should be analyzed without reference to syntax or morphology")—that a phonological analysis should be carried out only on its level, without any intervening knowledge of the grammatical structure of a given language. The junctures were introduced to the analysis as phonemic devices for reducing the number of phonemes of a language. They were meant to be purely phonemic and the fact that their placement correlated with grammatical boundaries was regarded as merely accidental. Pike fiercely criticized this. His argument was that a phonological analysis cannot be done properly without inference of the morphological and syntactical structure. On numerous examples and quotations he showed that, though *a priori* ruling out morphology and syntax from the analysis, analysts nevertheless used this extra-phonological knowledge in their analyses (this standpoint was criticized by other linguists, too, like Martinet 1962 or Vachek 1970 but only Pike gathered an amazing bundle of instances of contradictions in linguistic literature). For Pike, juncture was a non-phonemic modification of sounds at grammatical boundaries. Hockett 1948 reacted to Pike 1947 defending the idea of phonological analyses without any interference of grammatical knowledge. Later Pike 1952 replied by showing and quoting additional evidence.

The second large theoretical discussion revolved around the problem whether juncture was segmental or suprasegmental. No clear consensus was reached. Originally, that is for Trager and Bloch, junctures were phonemes *sui generis*. It was implied that juncture is a segmental phoneme. Moulton 1947 and Harris 1951 regarded it as a segmental phoneme. Hockett 1942 and Haugen 1949 viewed it, however, as a suprasegmental. At this connection it might be illustrating to quote from Joos 1958: 216:

> Finally one must assign juncture to a phonemic status: otherwise it is nothing. By hypothesis it can't be segmental: no room there. Hence we are forced to the Hockett solution: it is suprasegmental.

In 1960s another series of disputes on the status of juncture appeared. It was the invention and "development of sound spectrograph that made it possible to display acoustic features of speech which had been beyond the reach of earlier, cruder laboratory equipment" (Gårding 1967: 12). Ilse Lehiste did extensive laboratory research of the phenomena connected with the problem of junction and published a series of articles with her results. The most important is Lehiste 1960, *An Acoustic – Phonetic Study of Internal Open Juncture* where she investigated several pairs of words like *a nice man – an iceman*, *grade A – gray day*, *nitrate – night-rate* (plus *Nye trait*) etc., that is the words that were regarded as differing in the presence vs. absence of internal open juncture. The research revealed that these words really showed acoustic and phonetic differences but "[a]s a result of the acoustic analysis, it appear[ed] now that a reinterpretation of the phonemic status of internal open juncture [was] necessary" (Lehiste 1960: 47). Lehiste rejected juncture as a phoneme and defined it as boundary between two bounded sequences (p. 48).

The study of 1960 was later accompanied by other papers, Lehiste 1962, Lehiste 1965, where Lehiste investigated the problem of juncture in languages such as Finnish, Serbo-Croatian, Latvian and Czech. Another acoustic study was done by James E. Hoard (Hoard 1966) who investigated similar English pairs like Lehiste. He also rejected juncture and ascribed the difference in those pairs as resulting from different syllabic structures of those English words (but see Potter 1962). The same view is shared by Ernst Pulgram (Pulgram 1970: 111-24) who operates with syllabic structure of particular languages, only, dismissing wholly the idea of juncture. Eva Gårding presented a comprehensive study of open juncture in Swedish (Gårding 1967) and other linguists and/or phoneticians investigated additional languages, too.

The 1960s was also a witness of yet another significant event. It was the rise of generative linguistics which has since then had an overwhelming impact on world-wide linguistics. Though structuralist (and stratificationalist) linguists in America still tried to prove their worthiness, linguistics became dominated by generativists. Though some regard this as a grievous setback to the linguistic science as a whole, we do not want to make any judgments here (in fact, some views of Chomsky et al. 1956 conform to ours). However, we do not feel competent to judge and overview generative approaches to the problem of junction. The linguistic world has probably never before seen such a plethora of theoretical treatises, analyses and discussions as since the publication of Chomsky and Halle's *The Sound Pattern of English* (Chomsky & Halle 1968). The problem that arose in modern generative linguistics is that one must cope with "his inability to see the wood for the trees", as Vachek noted (1994: 28) when reviewing current phonological-generative schools. Since a detailed overview of various

approaches of generative linguists to the problems of junction goes beyond the knowledge of the present writer, we decided to leave this to the more competent. Interested readers are directed to the following bunch of papers: Stanley 1973, Basbøll 1975, Devine & Stephens 1976, Basbøll 1978a, Basbøll 1978b, Hyman 1978, Basbøll 1981 and a collection of original papers on juncture in Aronoff & Kean 1980. These papers reached us—thanks to the generosity of Tobias Scheer—when the final proofreading of this paper was being made and they could not be therefore adequately incorporated into the present work. Some of them were considered, though. We would like to make a special reference to Devine & Stephens 1976 where a critical overview of approaches to the problem of boundaries in phonology is presented. The writers employ strict logical thinking and point to a number of problems and logical deficiencies in various treatments, irrespective of the chosen theory.

Finally, we would like to refer to Tobias Scheer who is particularly interested in the problem of boundaries in phonology. Scheer 2006a contains a comprehensive summary of the problem, mostly in the sphere of generative phonology. Scheer 2006b is a special lecture on boundaries to be presented in August 2006 in Olomouc, Czech Republic. See these sources for more information and additional bibliographical references.

> Literature: for a survey of the problem of junction see Lehiste 1960: 5-13, Gårding 1967: 4-14, Allen 1962: 13-28 (especially of *sandhi*), Devine & Stephens 1976: 293ff., Hyman 1978 and Aronoff 1980; cf. also Makkai 1972: 4-6 and Joos 1958: 216, 420. Other papers not mentioned in the above overview but considered: Bolinger & Gerstman 1957, Bolinger 1958 and Shart 1965 (the first two are reactions to Chomsky et al. 1956).

4.3 The problem of junction from a functional viewpoint

In this section we want to discuss the problem of junction from a functional point of view or better, from a functionalist point of view. We should mention here once again that by *functionalist* we mean the type of functional and structural linguistics (in particular phonology) that has been developed, practiced and advanced by André Martinet and his associates. We do not want to discriminate other functional linguists who deserve this designation but the functional theory as developed by Martinet is—and we had many occasions to show it—very specific as contrasted with other theories.

To the best of our knowledge, the problem of junction has not been any particularly considered by functionalists. Of course, we leave here aside Trubetzkoy, ‘the father of func-

tional phonology', who dealt with this problem *in extenso* but he was discussed in the previous section. If non-functionalists dealt with the problem of junction from both a theoretical and practical perspective and investigated acoustic and articulatory processes behind the concept of juncture, this part of phonology appears never to be in Martinet's focus. In fact, Martinet explicitly writes that if, in a phonological transcription, there are instances of junctions, these are points "on a choisi de ne pas tenir compte dans l'analyse phonématique" (Martinet [1960] 1991, 3.7).

However, this does not imply Martinet's complete intentional ignoring of the problem of junction; he wanted no doubt to say the problem of junction did not belong to the domain of phonemics, though it belonged to phonology as a whole. Martinet's exclusion of the problem of junction goes hand in hand with his rejection of phonemics as practiced by American linguists (Martinet 1949: 10). For them, junctures were phonemes, which is a thing that cannot be accepted in functional phonology (see Akamatsu 2000: 51, Mulder 1968: 69-70).

Yet Martinet operates with a concept corresponding to juncture: a potential pause (*pause virtuelle* in French, see Martinet [1960] 1991, 3.5-3.7). The precise position of the potential pause in Martinet's theory is not clear. In phonology he was always immensely interested in the problem of neutralization and so the concept of the potential pause was centered on it as to account for neutralization processes that take place in vicinity of a pause, be it potential or actual.

Akamatsu follows Martinet in dealing with potential pauses as means for providing environment for neutralization (see Akamatsu 2000: 50-1). It follows from the fact that, as Martinet notes (Martinet [1960] 1991, 3.6), in some languages, we can encounter the same phonological behavior that takes place before a potential pause (which may in fact be manifested as an actual pause) also inside of words, at the boundary between morphemes. "For that reason a word like *linked* […] contains a potential pause between *link* and *ed*" (Akamatsu 2000: 50). In addition to this, Akamatsu appends a discussion on the famous triplet *night-rate*, *nitrate* and *Nye-trait*, the first and third of which contain a potential pause, but notes that Post-Bloomfieldian juncture cannot be equated with a potential pause, since juncture was a phoneme for Post-Bloomfieldian linguists while it "is never a phoneme to functionalists". The reason is that the words *night-rate*, *nitrate* and *Nye-trait* cannot be mutually opposed through the presence and absence of a potential pause or juncture, since they are of different structure (Akamatsu 2000: 51).

To the best of our knowledge, this is practically everything the so-called realist functionalists have to say about potential pauses. In his analysis of Japanese Akamatsu does not deal with it any further (aside from a mention on p. 114). Nor in two other phonological

analyses of realist functionalists (Martinet 1956, Walter 1977) are there any special sections that would deal with the position of a potential pause in the theory of functional phonology. In fact Martinet [1960] 1991, 3.5-3.7 together with Martinet 1965: 50-2 are the only places where the problem of a potential pause gets most attention.

Following the distinction between realist and axiomatic functionalists, we will now discuss the latter group. The problem of junction seems to be much better integrated into the overall theory here. Though it is a not a part of description of the phonological system of Pekingese in Mulder 1968, the concept of juncture is mentioned in the work and was later incorporated into the set of postulates for axiomatic functionalism.

Mulder has chosen the term *juncture* by which he follows the common practice. However, he has certain reservations toward it. It would be convenient to quote the relevant passage in full (Mulder 1968: 69-70) and to provide commentary thereto:

> Features of so-called 'juncture' are *functions* of cumulative [in practice, *cumulative* is synonymous with *culminative* – ab] features, i.e. of the 'peak' of phonological prominence and its 'dominating' power. They can be said to result automatically from the prominence, much as valleys can be said to be resultants of hills or mountains. Whether one indicates 'prominence' or 'juncture' (or both) in a phonological notation of text is largely a matter of convenience. It is not correct, however, as some linguists do, to call both prominence and juncture: 'phonemes', even if one calls all phonological entities 'phonemes' (Bloomfieldian terminology). There are merely *different aspects* of the same phenomenon.

What Mulder wants to say by this passage need not be obvious at the first sight. He uses certain notions (functions, cumulative features, prominence) that may blur the understanding. However, the comparison with mountains and valleys is very helpful. Bundles of phonemes in a certain arrangement, which constitute phonological forms of significant units, are like mountains: they are peaks of prominence which are compared with other peaks of prominence. In other words, a phonological form *qua* unit is in contrast with other units on the syntagmatic axis; there is a syntagmatic relation between the units. The function of such a phonological form is in fact comparable to the function of accent: both are peaks of prominence (note that here *prominence* should be meant as a general term, not as we defined it in 3.5, though they are related) that are contrasted with other entities—points of non-prominence. These points are junctures or valleys: a mountain can be a mountain only if it is higher than the surroundings (plains or valleys). For a mountain to exist there must be a valley which delimitates its extension and sets its boundaries. The same applies to junctures as compared to phonological forms: junctures set the boundaries of phonological forms. However, both junctures and phonological forms, and valley and mountains are aspects of the same thing: there is not one without the other, they are interdependent. Without valleys there would be no mountains, since mountains would merge into one. Similarly with junctures: without

points of division between particular phonological forms, the forms would merge into one conglomerate. Such a merger of course happens (cf. sandhi).

As to the phonological notation, Mulder states that, since juncture and prominence (phonological forms in this case), are different aspects of the same phenomenon, it is a matter of convenience which one of them is to be indicated or whether both should be indicated. In fact, indicating the prominence (i.e. phonological forms) is above all most important (it makes no sense to indicate boundaries of phonological forms and not to indicate the phonological forms themselves). Yet indicating junctures is also important, for instance, to show that we are dealing with two phonological forms or one (Mulder mentions Pekingese /pi-an/ vs. /pian/; English *aboard* vs. *a board* is comparable).

In addition, Mulder mentions that in accentual units (by Mulder called *accent groups*) "indicating 'juncture' would only make clear the *extension* of the cumulative units". This is a point that we are not in agreement with (see Bičan forthcoming *sub* e, here pp. 89-91). In a word, an accentual unit may contain an in-between juncture (diaereme) so that two successive junctures (diaeremes) do not indicate an extension of an accentual unit. This is a situation in Czech where the accentual unit /#p**o**T#oknem#/, manifested as either [p**o**doknem] or [p**o**tʔoknem], spelled *pod oknem* "under a window", contains an in-between diaereme, even though forming one accentual unit.

As already mentioned, in Mulder 1968 *Postulates for axiomatic functionalism* was in a pre-mature state. By the time that *Postulates* had taken the first definitive shape (on the history of *Postulates* see Mulder & Hervey 1980: 40-1), juncture was also incorporated into the theory, though no detailed account was provided. The reason for this is the fact that juncture, like accent, belongs among para-phonotactic features that, as a whole, are little described. In fact, the whole treatment of juncture is limited to grouping it among contrastive para-phonotactic features, together with accent (Mulder & Hervey 1980: 53, Mulder 1989: 452). It will be remembered that contrastive para-phonotactic features are defined as features "with the function of groupment over and above [phonotactic] groupment" (Mulder 1989: 451, see 3.2). Juncture is in close connection with accent: as Mulder writes, "[j]uncture, especially when not realised by 'pause', is frequently a function of accent" (Mulder & Hervey 1980: 53). However, it is possible, in fact desirable, to distinguish between accent and juncture (diaereme) as between two para-phonotactic entities. This problem is dealt with in Bičan forthcoming, part 3 (here pp. 86ff.).

4.4 On the term *diaereme*

In this section we want to address reasons we prefer the term *diaereme* instead of *juncture* or the like.

The term *diaereme* was adopted from a Czech linguist Adolf Erhart. Erhart (1990: 38-9, see also Erhart & Kořínek 2000: 83) divides phonological units into segmental and suprasegmental, and into phonematic and prosodematic in the following way (translated to English):

segmental phonemes	segmental prosodeme
suprasegmental phonemes	suprasegmental prosodeme

First of all, it should be noted that Erhart's use of *prosodeme* differs from the one we discussed in connection with Trubetzkoy. It is closer to the American way of employment of the term (see e.g. Haugen 1949, Hill 1961); the same is true from Erhart's use of *phoneme* (see e.g. Harris 1941, Hockett 1942). For Erhart, prosodemes are phonological units that do not form a paradigmatic system. In other words, they do not enter into paradigmatic relations, but only into syntagmatic ones (Erhart is one of the few Czech linguists—let alone linguists in general—who distinguishes between paradigmatic and syntagmatic relations; the latter relations are generally neglected). On the other hand, phonemes are units that enter into both paradigmatic and syntagmatic relations (in Erhart's words: they form a paradigmatic system).

The segmental phonemes are phonemes as they are generally viewed. Suprasegmental phonemes are tones. The suprasegmental prosodeme is accent. Finally, its segmental counterpart is what Erhart calls *dierém*. He does not mention the source of the term but it must be an article by М. В. Панов "О разграничительных сигналах в языке" (Panov 1961). For the ignorance of Russian of the present writer, the article was not particularly considered in this work.

It should be obvious that Erhart's division of phonological units is very similar to ours. In fact, it is this division that was the ultimate inspiration for the present work. Though we do not agree with Erhart in a number of points, his division is in principle acceptable.

What is important is the fact that we adopted the term *diaereme* from Erhart (and in turn from Panov 1961). Though our diaereme does not precisely correspond to Erhart's one (we do not accept the view that diaereme is a segmental unit like phonemes), the term itself is convenient for a number of reasons. First, we want to avoid the term *juncture*. This term have many meanings—as Martin Joos noted, "[t]he semantics of the word 'juncture' is confusing

and fateful" (Joos 1958: 216). For that reason some prefer to use *disjuncture*, others *schismeme*, *finalizer* or *transition* (see 4.2). The terms *schismeme* and *finalizer* did not become current and are avoided here. The term *transition* is also not quite suitable. We are left with *disjuncture* but even this term may not be appropriate if it is a mere substitute of *juncture*. Our erstwhile interest and aim is a functional view of the phenomenon but *juncture* or *disjuncture* has clear non-functional connotations. Of course, it could be acceptable if properly redefined as was done by Mulder whose *juncture* is actually our *diaereme*. That we use the latter term is largely in order to avoid unnecessary connotations with *juncture* and the like defined as phonemes by some American linguists. Finally, we should say that we prefer *diaereme* to Martinet's (Akamatsu's) *potential pause*, because the latter is an inconveniently long term and may even give an impression that diaereme/potential pause may always be realized by an actual pause, which is not the case (Martinet and Akamatsu are of course aware of this).

To cut it short, in this paper we use *diaereme* for similar phenomena that others call *juncture*, *disjuncture*, *finalizer*, *schismeme*, *transition* or *potential pause* (some also *phoneme of pause* and others). The disadvantage of doing so is the fact that *diaereme* is not a common term and may not give a hint of what it denotes unless one is cognizant of Classical Greek (it is related to *διαιρεσις* [diairesis] "division").

> Literature: on Russian *dierema* see Panov 1961, on Czech *dierém* see Erhart 1990: 38-9, 63-5, Erhart & Kořínek 2000: 83, on English *diaereme* see Fischer-Jørgensen 1975: 362; on application of Erhart's *dierém* on Czech and Sanskrit see Šefčík 2002a, Šefčík 2002b, Šefčík 2004; for a critical discussion of Erhart's (and Šefčík's) view and the origin of the term see Bičan forthcoming (here pp. 94ff.).

4.5 Definition of diaereme

In 4.2 we saw that the concept of juncture was found both fruitful and doubtful but was rejected as a phoneme at the same time. However, in functional phonology the problem of the phonemic nature of diaereme (or juncture) will never arise, because it can never be a phoneme in this approach. From the paradigmatic point of view, the phoneme is a simultaneous bundle of relevant features. From the syntagmatic point, it is the minimal phonological unit entering into paradigmatic relations that also enters into syntagmatic relations. Diaereme/juncture does not meet these conditions. It enters into syntagmatic relations but not into paradigmatic and is not a bundle of relevant features. That it does not enter into paradigmatic relation is due to the fact that there is no other entity with which it could enter into the rela-

tions. It does not therefore have distinctive function, either. We will address this question in 4.6 in detail.

Although juncture was rejected as a phoneme, it is obvious that there are certain phonic phenomena that can signal grammatical boundaries. So even if the occurrence of juncture *qua* phoneme was rejected in the pair *an aim* vs. *a name* (see Lehiste 1960), it does mean that there is not a difference between them. In fact, the difference is still present and has to be accounted for in phonology. Even if it is said to result from a marker of a syllable boundary, which need not be always the case (cf. Potter 1962 and Hoard 1966), this difference is nevertheless functional, since there IS a difference between e.g. *night-rate* and *nitrate*: the first is built up two phonological forms and the building-up is phonologically marked (as experiments showed). In *nitrate* there is no such marking or signal.

We believe that phonology should answer for such signals, since it is part of any given phonological system where such signals occur. What is more, these markings are relevant for communication (i.e. functional), because they show how utterances are constituted. Functional phonology seeks to describe functions of phonic features. Experiments and real-life experience have shown that the role of certain phonic features in a language is to indicate boundaries of significant units so that the given utterance is easily comprehended and not mistaken for anything else. An English speaker uses certain modifications of sounds to distinguish *night-rate* from *nitrate* or *an aim* from *a name*. The features of sounds have a certain function. It is a function that functionalists call *deliminative*. Since they have a function—are functional—it is obvious that they should be dealt with in functional phonology.

What was defended in the preceding paragraph is of course nothing new. It was already obvious to Trubetzkoy and a few others as early as 1930's and perhaps even earlier. However, Trubetzkoy did not operate with any phonological unit like diaereme; he only spoke about deliminative functions of certain phonemes or sounds and their combinations. Hence the question that rises before us is whether there should be any phonological unit of the kind from the functional point of view. In other words, whether the existence of diaereme is justifiable in functional phonology or whether we should rather stick to speaking about deliminative function of certain phonemes, sounds and their combination.

If one looks carefully on Trubetzkoy's account of boundary signals, he may come across a problem. Trubetzkoy recognized the deliminative function for both phonemes and sounds, i.e. particular manifestations of phonemes. A phoneme may have deliminative function if it always occurs, for instance, at the beginning of a word. However, how do we know that the context is precisely the beginning of a word? We can say this only after a paradigmatic and syntagmatic analysis of a given language were carried out. But still: why is it the

word-initial position the phoneme occurs in? It is because there is a grammatical boundary before it. Although there have been disputes about it, the grammatical boundary is phonologically relevant, since it sets the extension of phonological forms and allows for a description of distributions of phonological forms and phonemes. The objection that grammatical information is irrelevant to phonology should be rather dismissed. The objection was raised by those approaches (like Post-Bloomfieldian ones) that wanted to free phonology from grammar and asserted that no grammatical information should intervene with a phonological analysis (cf. e.g. Hockett [1942] 1972: 112). This view was challenged by a number of linguists (see e.g. Pike 1947, Pike 1952) and later completely rejected, in the first place, by generative linguists. The latter linguists, however, went a little bit too far. There should be lain a difference between the grammatical (morphological and syntactical) structure and the interrelation between the systems of the first and the second articulations. Phonology describes the phonological structure of phonological forms of signs which, it will be remembered, have a direct relation to the meaning. A phoneme is of course a unit of the second articulation and does not have a meaning by itself, but because of its distinctiveness it is connected with the meaning. Actually, a phoneme is a phoneme because it can distinguish between meanings!

However, not each and every grammatical boundary is relevant for a phonological analysis. The boundary should be somehow marked either by certain phonological processes (limited distribution or neutralization) or by special manifestations of phonological units (phoneme or their combinations). The leads us back to the question of sounds having deliminative function—as Trubetzkoy spoke about them.

We think it is not possible—in a functional theory—that both phonemes and sounds have deliminative function. It is of course true that the occurrence of certain sounds like aspirated occlusives in Tamil (see 4.2) signals a boundary but the aspiration is only a special type of manifestation of the occlusives before a boundary. What we want to say is that it is not actually the aspiration that would imply the boundary but it is the boundary that is responsible for the occlusives being realized as aspirated. It is the context that determines the realization. The realization is then what is usually called a positional or contextual or combinatory variant of a given phoneme. Just like e.g. /x/ is a little bit palatalized before palatal or front vowels in Czech, so are Tamil occlusives aspirated in vicinity of a grammatical boundary (examples can be easily multiplied).

That sounds cannot have deliminative function is because they are not in fact part of the phonological system; they belong to the level of realization. Phonemes are models of sounds, but sounds themselves are only the ways the phonemes are actually manifested. The manifestations are not only given by the general ways speech sounds are produced, but also

how they are produced in any given language and in any given combination with other sounds. To account for various manifestations of phonemes and for various phonological processes we think it justifiable to introduce the concept of diaereme as a unit that would be a representation of a phonologically relevant grammatical boundary just like phonemes are representations of relevant grammatical meanings (i.e. meanings as such). By this we do not want to suggest that diaereme be a phoneme, but like the phoneme, it is a model which gives advantage of being capable of accounting for various phonetic and phonological phenomena such as special manifestations, limited distribution and neutralization of oppositions.

This is basically the stance of Martinet and Akamatsu who speak about a potential pause (see above). They are of course aware of deliminative function being fulfilled by certain phonemes or their combinations but are also well aware of the fact that certain phonological processes take place exactly in vicinity of a grammatical boundary. They introduce the notion of a potential pause but do not attempt to ascribe it a firm position in functional phonology, probably because it might be easily mistaken for Post-Bloomfieldian junctures.

On the other hand, Mulder gives the juncture a place in his axiomatic theory. However, the juncture he has in mind in not the juncture as it is generally operated with. It is not a phoneme but a complex of certain contrastive (i.e. culminative) para-phonotic features, not much different from accent. In fact, there does not seem to be a precise discrimination between accent and juncture, both serve to indicate the culminative prominence. However, there are reasons for distinguishing between these two para-phonotactic units so as to account for different phenomena (for more on this see Bičan forthcoming).

We will follow Mulder in his concept of juncture but for the reasons mentioned in 4.4 we will speak about *diaereme*. We define *diaereme* as A CULMINATIVE PARA-PHONOTACTIC FEATURE WHOSE FUNCTION IS DELIMITATION OF PHONOTACTIC ENTITIES. The delimitation of phonotactic entities is of course already implied in diaereme being a culminative (Mulder's *contrastive*) para-phonotactic unit/feature, as the latter is defined as a para-phonotactic feature with the function of groupment over and above phonotactic entities (see 3.2 and Mulder 1989: 451). Accent and diaereme are closely connected and related but the difference between them is such that diaereme is always capable of delimitation of phonotactic units whereas the ability is not always lent to accent. Both accent and diaereme set unity to phonotactic entities but diaereme indicates in addition their boundaries (cf. Mulder 1989: 99-100).

In connection with accent we spoke about the domain of accent, this being an accentuable unit or more generally what we called *phonotactic base*. In the case of accent it is most commonly a syllable. Accent as if falls on the syllable. The syllable is a phonotactic entity which, together with para-phonotactic features grouped above and over it, forms a para-

phonotactic entity. The features of diaereme are generally grouped over phonological forms of words or morphemes. It means that they indicate boundaries of these phonological forms.

4.6 Functions of diaereme

Diaereme is a contrastive unit. We defined *contrastive unit* as a term of a contrast. But diaereme is not a distinctive unit, which we defined as a term of opposition, because it is not opposed to anything else. For that reason, diaereme has only contrastive function but not distinctive. In addition to the contrastive, diaereme also has culminative function, which we defined as a special type of the contrastive function. Deliminative function is also a special type of the contrastive function; diaereme has it, too. But all these characteristics of diaereme are established by its very definition. We will now try to look at reasons behind it.

Accent is a contrastive unit because the accented syllable is in contrast with the unaccented ones. The accented syllable shows certain prominence that the unaccented syllables do not. The difference between them is syntagmatically relevant. However, accent is not a distinctive unit because, in the given environment, it is not opposed to anything else: there is no paradigmatic functional difference between the prominence and something else.

The same is true for diaereme. There is a functional difference between a certain phonological form, which is in fact a peak of prominence (cf. the discussion on Mulder's view of juncture in 4.3), and diaeremes that delimit this form. In other words, there is a difference between instances where phonological forms of significant units occur and where they do not—there is a difference between the presence and absence of the phonological forms, so to speak. To put it in symbols, let us transcribe diaeremes as '#' and phonological forms as '*p*'. Then, an actual utterance can be transcribed in the following manner ('n' is a number of phonological forms, which are usually words, in the utterance); the example is from English:

$\#p_1\#p_2\#...\#p_{n-1}\#p_n\#$

#Sophie#is#a#beautiful#woman#

Although we do not claim that this utterance (*Sophie is a beautiful woman*.) should necessarily be realized is such a manner that all boundaries (all #'s) be phonologically transparent, for the sake of example we will suppose so. What is more, we will suppose that the diaeremes are manifested as pauses, as they indeed can be. There is a difference between instances of the utterance when words *Sophie*, *is*, *a*, *beautiful* and *woman* are uttered and where they are not, when there is a pause (i.e. a diaereme). Since both the words and diaeremes are necessary for the utterance (they are in relation of inclusivity) and since the order between them is functional, the relation of inclusivity is in addition ordered. It will be remembered that

we defined syntagmatic relations as ordered relations of inclusivity. The difference between the words and diaeremes is also functional—it is relevant to communication (it helps listeners recognize particular constituents of the utterance). The relation between them is therefore a contrast: there is a contrast between the diaeremes and the words. Since there is a contrast, both diaereme and phonological forms are contrastive units and have contrastive function.

Now, although we spoke about contrastive function, it should be obvious that the function of diaereme is actually culminative, which we defined as a special kind of contrastive function. The difference between diaeremes and phonological forms obviously help the listener distinguish between phonological forms. The forms are nothing but clearly defined by the circumscribing diaeremes. It should be also obvious that another function of diaereme is delimitative. It might be even said that the deliminative function is the very nature of diaereme.

All that has been written so far may be rather trivial. But a thing that may not be so trivial is the question of distinctiveness of diaereme.

To be distinctive means to be capable of distinguishing between meanings of significant units. In our theoretical framework it means to be a term of an opposition. In particular, it means to be a term of a commutative opposition. If we wanted to have diaereme distinctive, we have to find something with which it would commute.

We can return to Trager and Bloch's distinction between open juncture and close juncture. If we say that our diaereme is in fact their open juncture, we can say that there is then a difference between diaereme as a phonological representation of a grammatical boundary and phonological forms as representations of non-occurrence of a grammatical boundary. To give an example, we may suppose an opposition between *night-rate* and *nitrate*, the first of which contains a diaereme. If we transcribe close junctures by middle dots, we will get the following phonological representation:

/#n·a·i·t#r·e·i·t#/ *night-rate*

/#n·a·i·t·r·e·i·t#/ *nitrate*

The representations show that there is an opposition between open juncture (diaereme) and close juncture (absence of diaereme); it may be therefore argued that our assumption about non-distinctiveness of diaereme is erroneous. However, the representations are misleading. It gives an impression that /·/ and /#/ are commutable but they are not. They do not occur in the same positions. It is not correct to assume that the placement of /#/ and that of /·/ is identical, only because the phonemes before and after them are identical. The first /t/ in /#n·a·i·t#r·e·i·t#/ *night-rate* is syllable-final whereas the first /t/ in /#n·a·i·t·r·e·i·t#/ *nitrate* is

syllable-initial (the juncture in *night-rate* is actually a marked syllable boundary as was pointed out by phoneticians, see Lehiste 1960: 39ff., Hoard 1966, Pulgram 1970: 111ff.).

Though it need be obvious at the first sight, the transcription has another defect. We may either say that *night-rate* consists of two words and that *nitrate* is only one. Then we acknowledge the grammatical structure of the words and the question of commutability of /#/ with /·/ is ruled out, because *night-rate* is AB and *nitrate* is C where the capitals represent words. Then A can be commutable with C (that is, we could have *nitrate rate*, being a rate for nitrate) or hypothetically also B could be commutable with C (something like ? *night nitrate*). At any rate, *nitrate rate*, which is a valid utterance ("a lowering of the nitrate rate occurred again after the 1996 and 1997 crop years", taken from <http://www.cpnrd.org/GWMP.htm>), proves that *nitrate* and *night-rate* are not commutable. This is something, we suppose, with which even Zellig S. Harris would agree (see Harris [1951] 1960: 29-30, 179-80 wherefrom the notations 'AB', 'C' was taken) who is otherwise an adherent to junctures being distinct phonemes (*op. cit.*: 79-89).

But we could take another path and suppose that both *night-rate* and *nitrate* consist of single words only. There is an obvious difference between them. We should either acknowledge the existence of either two different phonemes /t_1/ and /t_2/ or two different phonemes /r_1/ and /r_2/ (or both). This is because the difference between *night-rate* and *nitrate* is in the fact that in *night-rate* the *t* is non-aspirated and the *r* is voiced whereas in *nitrate* the *t* is aspirated and *r* is voiceless. However, this is not quite desirable. The solution must be sought elsewhere. The difference is in the syllable division. The syllable boundary in *night-rate* is between /nait/ and /reit/. In *nitrate* it is between /nai/ and /treit/; this is why the /t/ is aspirated and /r/ is voiceless. Once we posit a syllable boundary (indicated by a dash) in *night-rate*, we must do the same in *nitrate*:

/nait-reit/ *night-rate*

/nai-treit/ *nitrate*

This proves once again that there is no commutation, since the syllable structure is different. We may say that the syllable division is distinctive here, but since there exists, in addition, *Nye trait* /nai-trei/ which is different from *nitrate* /nai-treit/, because the realization of /ai/ in the first is longer in duration than that in the second (all phonetic-acoustic information is taken from Lehiste 1960: 29-30), we would have to posit two different syllable boundaries, which also need not be quite desirable. In the end, the best solution is to regard *night-rate* and *Nye trait* as two words with different placement of diaereme (i.e. having different word structures: /#nait#reit#/ and /#nai#trait#/, respectively) as indeed they are grammatically. Only *nitrate* would be a single word (/#naitreit#).

Although diaereme is not and cannot be distinctive *per se*, there is a difference in meaning between *Nye trait*, *night-rate* and *nitrate*. What distinguishes these words and is therefore distinctive in PLACEMENT OF DIAEREME. It is no coincidence that, in languages with a fixed accent, it is also the placement of accent that is distinctive. This is a shortcut to saying that there is an opposition between various accentual patterns. Likewise, there is an opposition between various diaereme patterns, as it were. In Bičan forthcoming (here pp. 90-1) we discuss this question by illustrating it on the pair *an aim* vs. *a name* (acoustic-phonetic characteristics of these are described in Hoard 1966; Lehiste 1960 investigates a similar pair *a nice man* v. *an iceman*). This article is a place we which we give reference. However, we will return to this problem in the subsequent section where it will be discussed from a slightly different angle.

4.7 On concord

In the second chapter of this paper we mentioned *en passant* the notions of neutralization and concord in phonology. While the first one is very well explored and described (see especially Akamatsu 1988), it is not the case with the second. If we ignore scare notes in Martinet's (Martinet mostly deals with concord, French *accord*, in grammar, see [1960] 1991, 4.5) and Akamatsu's writings, the only accounts on concord in phonology we are aware of are in Mulder 1968: 24-5, 99-100, 204-8 and Avram 1989 but the latter source was not available to us at the time of writing.

We defined (commutative) opposition as a functional paradigmatic difference and contrast as a functional syntagmatic difference. This means that there is a certain difference between two or more entities which is relevant to communication either on the paradigmatic or syntagmatic axis. However, both oppositions and contrasts may not be operative in certain contexts. Suspension (i.e. inoperability) of an opposition is *neutralization*; suspension of a contrast is *concord*. Paradigmatic and syntagmatic relations are both important and indispensable for language; there are in mutual relationships. This holds for oppositions and contrasts on the one hand, and neutralizations and concords on the other.

Mulder (*op. cit.*: 204-8) distinguishes among three types of relations between neutralization and concord:

1. Neutralization is at the same time connected with concord; naturally, this holds *vice versa*, too: concord is connected with neutralization.
2. Neutralization is not connected with concord.
3. Concord is not connected with neutralization.

To understand when the first instance takes place, one has to realize that the 'product' of neutralization, in other words, the phonemic unit that stands in the context of neutralization is an archiphoneme, whereas the phonemic units standing in the context of relevance (where there is no neutralization) are phonemes. The archiphoneme is a sum of relevant features common to two or more phonemes (but only to these phonemes).

For instance, there are oppositions between voiced and voiceless phonemes in English /tip/ *tip* and /dip/ *dip* or /bet/ *bet* and /bed/ *bed*. Similarly, there is a contrast between voiceless and voiced phonemes in two of the mentioned words: /dip/ and /bet/ (namely between /d/ and /p/, and /b/ and /t/, respectively). However, the opposition between voiced and voiceless phonemes is neutralized after /s/: in words like *still* the phonemic unit occurring after /s/ is an archiphoneme /T/ ('alveolar occlusive', different to /t/ or /d/, which are 'voiceless alveolar occlusive' and 'voiced alveolar occlusive', respectively). Since the archiphoneme is neither voiced nor voiceless, the contrast between voiced and voiceless phonemes, which is operative in other contexts, is inoperative (suspended) in this particular case. It is an instance of concord which is phonetically realized as harmony between [s] and [t] in *still* and also between [s] and [p] in *spill*, [s] and [k] in *skill* etc., all being phonetically voiceless.

Neutralization not connected with concord is such when a particular position, not just the circumscribing phonemes and their relevant features, is responsible for the neutralization. An example is neutralization of the voiced ÷ voiceless opposition that takes place in the word-final position of words in Czech, German or Russian (e.g. Czech /leT/ being a phonological form of both *let* "flight" and *led* "ice", see Bičan 2006: 290-3). The position is unconditionally a position of neutralization.

The word-final position is a position before a diaereme. But it should be remembered that diaereme is not a segment and it is not a phoneme, either. It is a set of features signaling divisions of phonological forms (of words, morphemes etc.). Some may argue that there is concord between the archiphonemes in the word-final position and the diaereme. However, that diaereme may be manifested as a pause, which is voiceless (but this is actually a trick: a pause is devoid of any positive phonic features and thus of voice, too), and that the archiphonemes (e.g. /T/ in /leT/) are realized phonetically as voiceless, does not mean that there is concord between them. As Mulder puts it (*op. cit.*: 205):

> The difference between these two cases in that in the former, contexts of certain distinctive features [e.g. 'voiceless' of /s/ in /sPil/ *spill* – ab] *in all cases* lead to the suspension of opposition between certain features [e.g. between voiceless /t/ and voiced /d/ – ab], whilst in the latter, the context is a position [e.g. the word-final position in /leT/ – ab], i.e. a contrastive, but not distinctive, feature which *in all cases* generates the suspension.

The difference between these two cases can also be illustrated on the Czech word *šest* "six". A phonological form of this word is /šeST/. /T/ is an archiphoneme 'alveolar occlusive', a product of neutralization between /t/ and /d/ in the word-final position, the same as the one in /leT/ on which see Bičan 2006. Here it is the position that is responsible for the neutralization. The archiphoneme /S/ 'alveolar fricative' is a product of neutralization between /s/ 'voiceless alveolar fricative' and /z/ 'voiced alveolar fricative'. The neutralization is generated by the presence of the archiphoneme /T/: the commutation test has revealed that before the archiphoneme /T/ the opposition 'voiceless' ÷ 'voiced' is neutralized just like after the phoneme /s/ in English /sTil/ *still* or /sPil/ *spill* or /sKil/ *skill*. The contrast between /s/ and /z/ and /T/, operative elsewhere (e.g. in /saT/ *sad* "orchard" and /zaT/ *zad* "back (gen.)") is suspended in /šeST/ *šest* "six". Phonetically, this concord is realized as a voiceless cluster [st] before a pause or as a voiced cluster in utterances like [fšezdb**u**dud**o**ma] *v šest budu doma* "I will be at home at six".

As to the possibility when concord is not connected with neutralization: This case is subdued by specific and limited distribution of phonemic units, but not by suspension of paradigmatic differences between them. Czech will again provide an example. Let us consider phonological forms /stáT/ and /zdáT/ of words *stát* (*se*) "to become" and *zdát* (*se*) "to appear". Though these forms are manifested as [sta:t] and [zda:t], respectively, one should not be confused and regard them as instances of neutralization. We cannot say that the opposition /t/ ÷ /d/ is neutralized after /s/ (as in English /sTil/) or after /z/, and we cannot interpret these forms as /sTáT/ and /zTáT/, because we could equally claim that the opposition /s/ ÷ /z/ is neutralized before /t/ or /d/ and interpret [sta:t] and [zda:t] as /StáT/ and /ZdáT/, respectively. We are not aware of any criterion according to which either solution could be non-arbitrarily chosen. The soundest solution is to interpret the forms as /stáT/ and /zdáT/. A corollary of this is a statement that clusters /sd/ and /zt/ are non-occurent in Czech. All this leads to the fact that there is concord between /s/ and /t/ in /stáT/ (both are 'voiceless'), and /z/ and /d/ in /zdáT/ (both 'voiced') without there being any neutralization.

The reason we dwelt so long of the concept of concord is because it is little explored and less than little known. For many this would be an unnecessary or even suspicious concept. It is true that the problem of concord is yet to be fully explored in functional phonology. We will now discuss the problem of concord in connection with diaereme (we discuss it fleetingly in Bičan forthcoming, too).

We will take advantage of the English triplet we have discussed in the previous section. In summary, the phonological structure of these items is as follows (omitting accents):

/#nait#reit#/ *night-rate*

/#nai#treit#/ *Nye trait*

/#naitreit#/ *nitrate*

The diaeremic pattern of /#nait#reit#/ may be represented as #4#4#; that of /#nai#trait#/ as #3#5#; and that of /#naitreit#/ as #8# (where integers stand for the number of phonemes in between the diaeremes). Now the pattern #4#4# is opposed to the pattern #3#5# and to the pattern #8# so that there is a functional paradigmatic difference between how the construction /naitreit/ (i.e. a phonotactic bundle of phonemes /n, a, i, t, r, e, i, t/) may be constituted on the para-phonotactic level. That is to say: the bundle of phonemes, which is identical at the level of phonotactics, may acquire different identities when para-phonotactic features as added. This is comparable to e.g. Pekingese Chinese when the syllable—a phonotactic construction that is, at the level of phonotactics, analyzed into phonemes /m/ and /a/—acquires several different identities according to what tone/toneme (a para-phonotactic feature) is attached to it (cf. Mulder 1989: 92). Similarly, the English phonotactic construction /insalt/ will acquire different identities if para-phonotactic features of accent are attached to the first (resulting in a noun) or the second (a verb) syllable. At the level of phonotactics, however, phonological forms of the noun and of the verb are identical, which equals to saying they are constituted of the same phonemes.

Now, for *night-rate*, *Nye trait* and *nitrate* the phonological form at the phonotactic level is also identical: it is /naitreit/. The difference between the words is subsumed in the opposition between the patterns #4#4#, #3#5# and #8#:

phonotactically:	**pattern:**	**para-phonotactically:**	**word:**
/naitreit/	/#4#4#/	/#nait#reit#/	*night-rate*
/naitreit/	/#3#5#/	/#nai#treit#/	*Nye trait*
/naitreit/	/#8#/	/#naitreit#/	*nitrate*

As there is an opposition between the patterns, there is a contrast between /nait/, /#/ and /reit/ in /#nait#reit#/ and between /nai/, /#/ and /treit/ in /#nai#treit#/; this contrast is not found in /#naitreit#/. What we now want to suppose is that the mentioned contrast may be suspended. It is only a hypothesis and the whole matter is yet to be fully considered.

What is however not a hypothesis is that the difference between the phonological forms /nait/ and /reit/, and /nai/ and /treit/ on the one hand, and the phonological form /naitreit/ on the other may be obliterated. In other words, it is possible that *night-rate*, *Nye trait* and *nitrate* be all pronounced identically without any phonic difference between them.

Such a situation may happen in fast and careless speech but also may be found at certain speakers in normal speech (registered by Hoard in 1966: 98-101).

At this stage of our research we deem that in such a case all three words must be interpreted as /#naitreit#/ because there is no phonic difference between them if all are pronounced identically. The obliteration of the difference is subdued by neutralization of the opposition between the patterns #4#4#, #3#5# and #8#. Likewise, we think that if there is a contrast between /nait/, /#/ and /reit/ in /#nait#reit#/ *night-rate* and between /nai/, /#/ and /treit/ in /#nai#treit#/ *Nye trait*, this contrast is suspended when both *night-rate* and *Nye trait* are pronounced identically as *nitrate*. In other words: if there is a functional syntagmatic difference between /nait/ and /reit/, and /nai/ and /treit/ under certain circumstances, the difference may be cancelled under other circumstances. In yet other words: if there is a contrast between /nait/ and /reit/ in /#nait#treit#/, and /nai/ and /treit/ in /#nai#treit#, there is concord between them in /#naitreit#/, the last of which stands for both *night-rate* and *Nye trait*—and for *nitrate*, too. The situation can be summarized in the following table; it demonstrates the situation when all items are pronounced identically. Compare it with the preceding table which demonstrated a situation when the items were mutually different in pronunciation.

phonotactically:	**pattern:**	**para-phonotactically:**	**word:**
/naitreit/	/#8#/	/#naitreit#/	*night-rate*
/naitreit/	/#8#/	/#naitreit#/	*Nye trait*
/naitreit/	/#8#/	/#naitreit#/	*nitrate*

4.8 Structural and realizational implications of diaereme

By *structural and realizational implications* we will means those repercussions diaereme can have on the phonological structure of a language. By *phonological structure* we mean the systems of phonological units of a given language (including phonotactic as well as para-phonotactic entities), their mutual relationships alongside with the ways these phonological units are manifested. We could perhaps equally well speak about manifestations or realizations of diaereme, were it not for the danger that this might be interpreted as that diaereme itself acquires some phonic substance. This is little common; diaereme is rather realized on other units, as it were.

We distinguish between structural and realizational implications of diaereme. The latter refers to how phonological units are realized in vicinity of or due to the presence of diaereme. A typical example may be Czech where word-initial (i.e. after diaereme) vowels may be

realized with a glottal stop. Another example may be the difference between English *night-rate*, *Nye trait* and *nitrate* as described in Lehiste 1960: 29-30. For instance, aspiration of the first [t] in (*Nye*) *trait* and *nitrate* devoices the following [r]; in *night-rate*, the aspiration is not found. [ɑɪ] of *Nye* is longer in duration than that of *night* and *nitrate*. There are other cues described in Lehiste 1960 as well as in other works. In general, various pre-diaeremic and post-diaeremic manifestations of phonemes are treated in phonetic descriptions of particular languages.

On the other hand, by structural implications we mean specific characteristics and behavior of phonological units in vicinity of diaereme. There are two basic structural implications: neutralization and limited distribution (also called *defective distribution*) of phonemes. Others may be cases of concord such as so-called vocalic harmony in Hungarian and/or various melody contours. In this paper we refrain from discussing these in detail, as it requires additional research and analysis.

We discuss issues connected with the problems of manifestations of diaereme in two articles of ours: Bičan 2006 and Bičan forthcoming. Due to the uttermost relevancy of the latter article to this paper, its pre-print version is enclosed to this work as Supplement (cf. also Preface). In this section we will provide some additional comments.

First of all, we want to discuss the difference between neutralization and limited distribution. The latter notion subsumes distribution of phonemes in a language (we will speak about phonemes only, though the principle holds for tonemes as well). Every language has a set of phonemes and a set of positions where these phonemes may occur. However, not every phoneme can occur in every position. There is generally a difference between the distribution of vowels and consonants—the distribution of these two sets of phonemes tends to be mutually exclusive. Yet it does not mean that there is equal distribution for every member of these sets. Not every consonant or vowel can occur in a given position. A good example is English /h/ and /ŋ/: the first occurs only word-initially (e.g. *head*) while the second occurs only word-finally (e.g. *sing*). It is true that both can occur, under certain circumstances, also word-medially but even here the distribution has peculiar limitations (e.g. *ahead* or *singer*). Leaving aside the peculiarities, we can say that English /h/ and /ŋ/ have limited distribution (they are not opposed by commutation but are opposed in the overall system).

It is no coincidence that we described limited distribution of English /h/ and /ŋ/ at the beginning and the end of a word, respectively—in other words: in vicinity of diaereme. It is exactly the special nature of the word (morpheme) boundaries that is, so to speak, responsible for the limited distribution. Though it does not mean that limited distribution is the exclusivity

of the grammatical boundaries, as limitations can be found word-/morpheme-medially, too, it is often at the boundaries that special phenomena occur.

Another example may be combinations of phonemes. On the one hand, we can register a certain number of word-medial consonant clusters whose structure can usually be generalized by simple formulae; we can, on the other hand, find another number of phoneme combinations that are found only across grammatical boundaries. An example may be geminated consonants in Czech: leaving aside a few exceptions like *racci* "sea-gulls" (sing. *racek*), *křečči* "hamsters" (sing. *křeček*), doubled consonants can occur only across a grammatical boundary (e.g. *nejjemnější* "softest", *nej-* superlative prefix, *jemnější* "softer"). These phenomena were already described by Trubetzkoy and others (see 4.2); it is their existence that justifies the concept of diaereme.

Nevertheless, not every restriction on occurrence of phonological entities should be interpreted as limited distribution. Functional phonologists (of Martinet's stream, one should add; the Prague functionalists like Vachek do not make the difference, see e.g. Vachek 1994: 16) maintain that a difference between neutralization and limited distribution of phonemes should be lain. The difference is not superficial, not even an unnecessary 'invention' of Trubetzkoyan linguists that "confuses the facts without adding anything", as Hockett claims ([1942] 1972: 105). What he has in mind is, for instance, the problem of the word-final obstruents in Czech, German or Russian. It is well-known that only phonetically voiceless obstruents can occur before a pause in those languages. A typical non-functionalist analysis of this is a statement of limited distribution of voiced obstruent phonemes in these languages: they simply do not occur word-finally (see e.g. Harris [1951] 1960: 203). For functionalists this is, however, a question of neutralization: the opposition between 'voiced' and 'voiceless' phonemes is neutralized word-finally; the unit occurring in that position is an archiphoneme (we discuss and compare the two approaches to this problem in Bičan 2006).

It may be argued that by the introduction of neutralization and especially by archiphonemes we complicate unnecessarily the analysis and enlarge unduly the stock of distinctive units in a language, since a list of archiphonemes ought to be provided in addition to the list of phonemes. However, a smaller number of phonemes need not imply a simpler analysis. The reason behind functionalists' insistence on neutralization is in belief that, so to speak, the phenomena that result unconditionally from particular speech habits of the speakers of a given language (neutralization) should be differentiated from the phenomena that are as if accidental to the given language (limited distribution). Though the difference between the two types of phenomena may be vague, there is a clear motivation.

Let us take, for instance, the Czech word-final neutralization: That only phonetically voiceless obstruents occur word-finally is a thing that unconditionally happens every time before a pause in standard Czech. Czech speakers do not usually realize this but all are doing this. The habit is even extended on words borrowed from foreign languages, and Czechs also have problems with learning the distinction between English *bet* and *bed* (personal experience shows that even though the difference can be produced, it need not be perceived).

On the other hand, limited distribution of phonemes may be, to some extent, accidental. For instance, the distribution of English /h/ is largely limited to word-initial position. Though English speakers may have problems with pronouncing [h] word-finally, the phoneme /h/ was easily adopted word-initially. The words like *behalf*, *behave* etc. were originally built of two morphemes, so that it could be said the /h/ occurs only morpheme-initially. However, during the development of English the bi-morphemic structure ceased to be perceived and the words should be treated as mono-morphemic in present-day English. The phoneme /h/ can now occur word-medially.

Another difference between limitation of occurrence and neutralization may be illustrated on Czech /g/. There may be disputes whether it is a phoneme of Czech, because the sound [g] occurs as a positional variant of the phoneme /k/ in what is usually regarded as native Czech vocabulary. Yet since in recent years Czech acquired and adopted a considerable number of foreign words, so that there is now an opposition between /k/ and /g/, we should regard /g/ as a separate phoneme. The distribution of [g] was somewhat limited and is still limited when interpreted as the phoneme /g/ (here the limitation is, however, more lexical than phonological), yet it participates automatically in the word-final neutralization in Czech (words *mák* “poppy” and *mág* “magician” are both pronounced [ma:k]).

There are other instances of the difference between limited distribution and neutralization, and yet other reasons for distinguishing between the two. They are discussed *in extenso* in Akamatsu 1988: 157-92, Akamatsu 1992a: 103-9.

To sum it up: functionalists make difference between limited distribution of phonemes and neutralization and occurrence of archiphonemes in the position of neutralization. Both phonological phenomena may and usually take place across grammatical boundaries. Indeed, both phenomena are tightly connected with grammatical boundaries, hence with diaeremes as means for signaling the boundaries. To put it in other words: the limited occurrence of phonemes and neutralization processes on the one hand, and the existence of diaereme on the other, are interdependent—in general mutually presupposing each other.

Instances of limited distribution of phonemes across grammatical boundaries were already mentioned (see also Trubetzkoy 1939: 218-30). Neutralization processes—in particular

the word-final neutralization in Czech—in vicinity of the boundaries are mentioned in Bičan forthcoming *sub* d (here p. 89), and in Bičan 2006: 288-93. Although we stick to instances of word-final neutralization in Czech (but the same neutralization is found in German or Russian), which we do for the sake of convenience, it does not mean that there need not be other kinds of neutralization in other languages. Trubetzkoy mentions a number of them in 1939: 212-3; he gathers them under the term *centrifugal neutralization* (the term from Trubetzkoy 1969).

Another example of word-final neutralization may be Sanskrit. For non-nasal occlusives in the language, a difference is lain between voiced and voiceless, and aspirated and non-aspirated (e.g. [k], [k^h], [g], [g^h]). The difference between them is functional—they are mutually opposed in certain contexts (hence phonemes /k/, /k^h/, /g/, /g^h/). Word-finally, however, the oppositions 'voiced' ÷ 'voiceless' and 'aspirated' ÷ 'non-aspirated', at the same time, are neutralized. Phonetically speaking, only [k] occurs from the mentioned set; the sound should be interpreted as a manifestation of an archiphoneme whose sums of relevant features equals the sum of relevant features common to phonemes /k/, /k^h/, /g/, /g^h/. On this cf. e.g. Šefčík 2004. Let it be noted that, though using the terms *neutralizace* [neutralization] and *archifoném* [archiphoneme], Šefčík does not follow the functionalist interpretation and seems to interpret the Sanskrit problem as a sort of limited distribution of Sanskrit phonemes: the word-final [k] is a positional variant of /k/, /k^h/, /g/, /g^h/. We do not agree with this.

There is yet another thing that has to be mentioned. The problem of sandhi was not discussed in this paper in any special detail, though it is definitely connected with the problem of junction and hence with our diaeremes, too. We referred to Allen 1962 for sandhi in Sanskrit but Allen's approach is not functional. Sandhi is not found in Sanskrit only, but exists in other languages, too. In French it is, for example, called *liaison* (for liaison in French see e.g. Hall 1948: 13-4, 17-8, cf. Pulgram 1965: 131, fn. 8). That sandhi or liaison is found in other languages, too, can be demonstrated on so-called intrusive *r* in Southern British English. Cf. this pair of utterances:

[əʊldə] *older*

[əʊldərəndwaɪzə] *older and wiser*

To put it in words: the word *older* is pronounced in Southern British English without the final [r] as is common in American English or Scottish English or other dialects/variants. However, when combined with *and*, there appears a so-called intrusive *r* which eases the transition from one vowel to another. The intrusive *r* is not, however, limited to words that end in spelling in *–er*; the principle is general: if one word ends with a vowel and the other begins with another vowel, the transition between them might be achieved via the intrusive *r*. Al-

though it might be argued that in *older and wiser* the intrusive *r* may be in fact justified by being, as some might claim, 'underspecified' or in 'deep structure', it can hardly be justified in examples like the following one (on intrusive sounds in Southern British English see Firth [1948] 1972: 259). Here the intrusive *r* is between *vanilla* and *ice*.

[vənɪlə] *vanilla*

[vənɪləraɪs] *vanilla ice*

Examples like this might be multiplied from many languages. The problem to challenge is how this phenomenon is to be interpreted in phonology from a functional standpoint. Should they be given a phonological status at all? That is: should the intrusive [r] be interpreted as the phoneme /r/? Until further investigation is carried out, we will classify intrusive sounds under so-called *parasitic sounds* (on which see Mulder 1968: 203-4).

To conclude this section we give the following list of possible structural and realizational implications of diaereme (note that the list is representative rather than exhaustive):

1. realizational implications:
    a. diaereme is manifested as an actual pause (the most natural but not the most common manifestation)
    b. the presence of diaereme (a grammatical boundary) is reflected on pre-diaeremic and/or post-diaeremic phonemes: their manifestations are markedly different from other manifestations of the same phonemes (e.g. *an aim* vs. *a name*)
    c. diaereme is manifested as accentual prominence of a certain syllable of the word(s) delimited by diaeremes (such might be the situation in Czech, but for this language we interpret the prominence as accent, see Bičan forthcoming *sub* b, f, here pp. 87-9, 91-3)
    d. post-diaeremic vowels may be manifested with a glottal stop (as in Czech or German); in principle, it may be any other sound; it may be the pre-diaeremic position, too
    e. phonological forms enclosed by diaeremes may exhibit certain melody or intonation contours (this usually holds for phonological forms of sentences)
    f. diaereme may be manifested by means of certain parasitic sounds (like intrusive *r* in British Southern English)
2. structural implications:
    a. neutralization processes in vicinity of diaeremes (e.g. the word-final neutralization in Czech, German and/or Russian)

b. distributions of phonemes/tonemes or their combinations limited to contexts adjacent to diaeremes (e.g. a combination /jj/ in Czech)
c. certain types of concord (such as vocal harmony)

Literature: on description of manifestations of sounds across grammatical boundaries see e.g. Lehiste 1960 (for English), Lehiste 1962 (for Estonian and English), Lehiste 1964 (for English), Lehiste 1965 (for Finnish, Czech and Serbo-Croatian), Gårding 1967 (for Swedish), Hoard 1966 (for English), Hall 1948b (for French), Pulgram 1970: 52-65 (various languages); the list could be extensively enlarged. On neutralization in various phonological theories see Davidsen-Nielsen 1978; in functional phonology Akamatsu 1988. On defective distribution see Akamatsu 1988: 157-92. On problems of manifestations of diaereme see also Bičan forthcoming.

CONCLUSION

In the preceding chapters we sought to introduce a part of a theory of functional linguistics, in particular of functional phonology. Besides discussing general aspects of the theory itself, we concentrated on the problem of accent and diaereme.

Functional phonology is a type of phonology that operates with the assumption that language is a system endowed with various functions; studying, describing the functions and grasping them into a theory is the ultimate goal of functional phonology. This type of phonological approach has its roots in the linguistic school of Prague (known as the Prague School and the Prague Linguistic Circle). It was most of all developed by Nikolai S. Trubetzkoy. In this paper we stick to functional phonology as later developed by André Martinet, whom we regard as the direct carrier and further developer of Trubetzkoy's thoughts. This type of functionalism was later axiomatized by Jan W. F. Mulder whose functional theory is largely reflected here.

In addition to other principles of functional and structural linguistics, we view language as a system of relations, the two most important being paradigmatic and syntagmatic relations. We define these, inspired by the glossematic theory of Louis Hjelmslev, as logical operations of exclusive disjunction (paradigmatic relations) and ordered conjunction (syntagmatic relations). However, we do not operate with truth-values but with the dichotomy *present* vs. *absent*. From these two basic types of relations we derive the relations of *opposition*, *contrast*, *neutralization* and/or *concord*. Also, the relations provide the basis for defining the concepts of *relevant feature*, *phoneme*, *syllable*, *accent*, *diaereme* and others.

The difference between paradigmatic relations and syntagmatic relations gives us also advantage of defining the basic functions of the phonic substance: distinctive function, contrastive function, culminative function and deliminative function. We distinguish between functions derived for the paradigmatic aspect of language (distinctive function) and the ones from the syntagmatic aspect of language (the other mentioned functions).

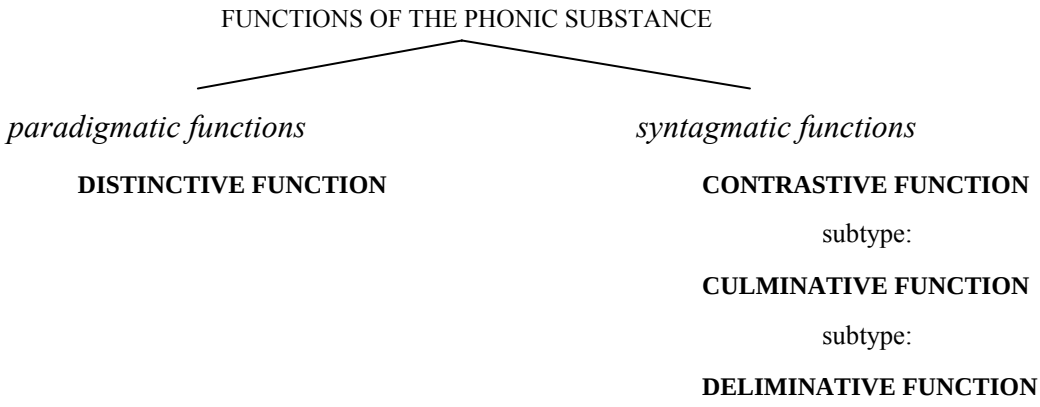
A phonic entity is said to fulfill DISTINCTIVE FUNCTION if by commutation with other entities it can distinguish between meanings of higher-level entities (units endowed with meaning—signs). In other words, it means that there is a functional paradigmatic difference (so-called *opposition*) between entities fulfilling distinctive function.

Unlike other functionalists, we make difference between contrastive and culminative functions, both being syntagmatic functions. CONTRASTIVE FUNCTION is in fact the syntagmatic parallel of distinctive function: entities have contrastive functions if there is a functional

syntagmatic difference (so-called *contrast*) between them. It helps the listener differentiate among particular constituents of an utterance.

Culminative and deliminative functions are special types of contrastive function. In an utterance there may be a certain phonic element that is phonically markedly different from other elements of the same utterance. If this is the case, the element is said to have CULMINATIVE FUNCTION, because it forms the peak of culmination in the utterance and thus helps the listener understand better the structure of the utterance. Since language is a system of signs and these signs tend to be discrete, certain phonic elements may fulfill another syntagmatic function in an utterance: there may signal boundaries of the signs so that the utterance is better understood. Such elements are said to have DELIMINATIVE FUNCTION, which is a type of culminative function, since the delimitated discreet signs culminates in the utterance, too.

Although there are other functions of the phonic substance, in our paper we operate with only the most important ones. A summary of them is given in the following table:

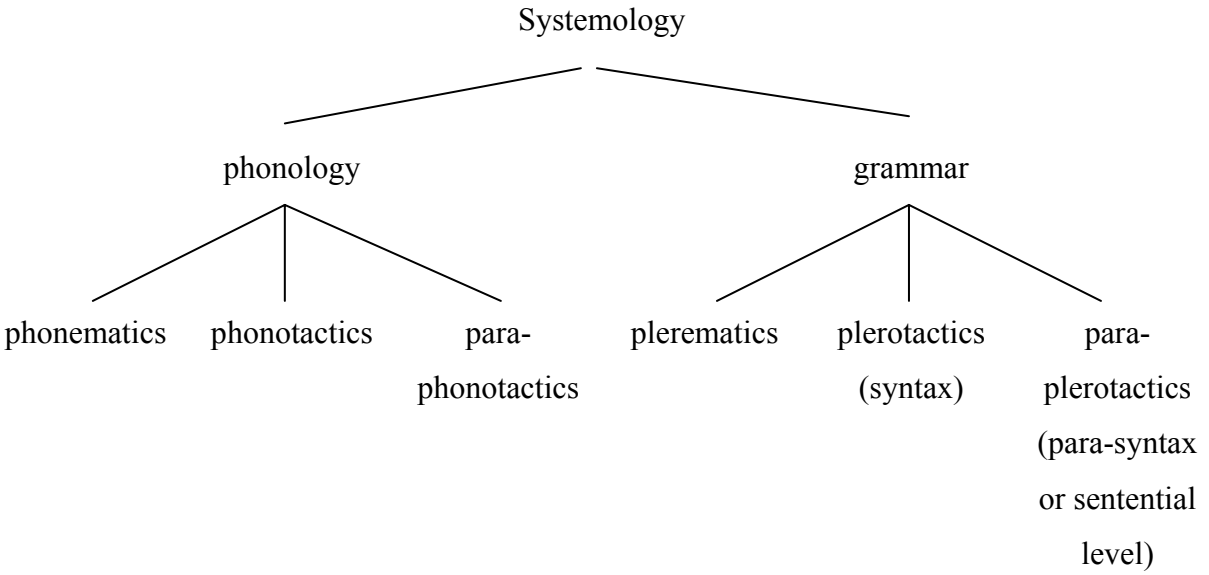


As already mentioned, Martinet further developed functional phonology of Trubetzkoy's and Mulder later axiomatized it. Mulder operates with five axioms, Axioms A, B, C, D, E, F, all of which we mentioned, though they are of various relevance for the present paper. Axiom F is an axiom for functional semantics and is altogether ignored here. Axiom E operates with realizations of phonological or grammatical units and is not of so much importance here. Axiom A is the most important one, as it sets the so-called functional principle through which everything is judged in functional linguistics (which means that only those things that are functional represent the object of investigation for a functionalist).

Axioms B, C and D form what Mulder called *systemology* of the theory (see Mulder & Hervey 1980: 73-87, Mulder 1989: 90-1). First of all, there is a distinction between the first articulation (grammar) and the second articulation (phonology). Functionalists of Martinet's wing operates with the theory of double articulation. Secondly, since language has the para-

digmatic and syntagmatic aspect, phonology is divided to phonematics and phonotactics, one deals the phonological units from the paradigmatic point of view, the other from the syntagmatic one; grammar is divided to plerematics (or morphology) and plerotactics (or syntax) and the division is arrived to by the same criterion. Moreover, there are two additional levels, one of para-phonotactics and one of para-plerotactics (para-syntax or the sentential level). These levels account for features that, as it were, accompany tactic levels. The levels are usually known as levels of suprasegmental or prosodic features but the difference between tactics and para-tactics is governed by the functional principle, not by the articulatory difference between phonic elements as it usually done for segmentals on the one hand and suprasegmentals or prosodies on the other.

The structure of systemology may be illustrated in the following table:



The level of grammar is little explored in this paper. Our interest is wholly concentrated on phonology. Nevertheless, even the whole system of phonology is not explored here; we focus mostly on the para-phonotactic level, since this is the level of accent and diaereme, the topics of our work. Yet if we want to describe the position of accent and diaereme in functional phonology, we have to delineate the position with respects to other phonological units.

We distinguish between distinctive units and contrastive units. DISTINCTIVE UNITS are those units that are terms of oppositions and hence enter into mutual paradigmatic relations. CONTRASTIVE UNITS are on the other hand those units that are terms of contrasts and hence enter into mutual syntagmatic relations. As was hinted in the preceding paragraphs, we also distinguish between phonotactic and para-phonotactic units. PHONOTACTIC UNITS acquire their identity on the phonotactic level whereas para-phonotactic units acquire their identity on the

para-phonotactic level. PARA-PHONOTACTIC UNITS are basically those that others call *suprasegmental* or *prosodic*. The terminology is actually quite immaterial as long as it is remembered that the distinction should be arrived as by the functional principle. Our division of basic phonological units is represented in the following table:

		contrastive units	
		phonotactic	*para-phonotactic*
		SYLLABLES	ACCENT, DIAEREME
distinctive units	RELEVANT FEATURES	PHONEMES	TONEMES

RELEVANT FEATURES as what other call distinctive features but in functional phonology these are not *a priori* and universally established phonic features as the distinctive features in Jakobsonian or Chomskyan phonological theories. Though there are based on the phonic substance, relevant features are more like relational characteristics of phonemes, which are simultaneous (unordered) bundles of relevant features. Relevant features can, therefore, enter into paradigmatic relations, never into syntagmatic ones.

As already mentioned, PHONEMES are unordered bundles of relevant features. Like them, they are also distinctive units and therefore enter into paradigmatic relations with each other. But in addition to this, they can also enter into syntagmatic relations. As such they form an intersection of distinctive and contrastive units. In fact, phonemes are the minimal units that are both distinctive and contrastive on the phonotactic level.

If relevant features are the minimal units that enter into paradigmatic relations only, syllables are the minimal phonotactic units that enter into syntagmatic relations only. A SYLLABLE is a subtype of what Mulder calls *distributional unit*, being a bundle of positions upon which the distribution of phonemes can be exhaustively described. A syllable, however, is not a distinctive unit by itself, since it is not opposed to anything else. If, in some languages, there appears to be a difference between several types of syllables, it is generally an outcome of different syllabification, not of the existence of different paradigmatic syllables.

We now get to the para-phonotactic level as the level accompanying the phonotactic one. Here belong so-called TONEMES (they may also be called TONES). If there was not a danger that it would slip into confusion, we could call tonemes as phonemes on the para-phonotactic levels. This is because tonemes are, like phonemes, distinctive units and hence they distinguish between meanings. Tonemes are distinctive para-phonotactic features.

The remaining two basic phonological units are accent and diaereme. They are both para-phonotactic units that are enter into syntagmatic relations only. They are therefore contrastive units on the para-phonotactic levels. They are not distinctive. The difference between them is lain on the basic of the function they fulfill: ACCENT is a contrastive para-phonotactic unit which fulfils culminative function; DIAEREME is a contrastive para-phonotactic unit fulfilling deliminative function. Since these units are discussed in great detail in this paper, we will summarize their basic characteristics now.

Following Martinet and especially Mulder, we defined accent as A CULMINATIVE PARA-PHONOTACTIC FEATURE ATTACHED TO ONE AND ONLY ONE ACCENTUABLE UNIT WITHIN AN ACCENTUAL UNIT. Alternatively, it could be defined as FUNCTIONAL PROMINENCE, the prominence being certain articulatory discrimination of one element from others in a given utterance.

An ACCENTUABLE UNIT is a subtype of what we called PHONOTACTIC BASE. It is a certain construction, a certain set of phonemes, upon which para-phonotactic features are attached. These may be accent, diaereme and/or tonemes. For accent the phonotactic base is called accentual unit. It is generally a syllable but in some languages (like Japanese) it may be a so-called moraic unit.

An ACCENTUAL UNIT is a phonological form of a significant unit. Accent is attached on one accentuable unit within an accentual unit. An accentual unit may be a morpheme or word; this depends on particular languages. The minimal accentual unit for English is a morpheme, for Czech it is probably a word. By the definition of accent, an accentual unit must contain at least TWO accentuable units (in most languages syllables). This is because the accented syllable must be contrasted to at least one unaccented syllable; otherwise there would be no contrast and no accent. Likewise, functional phonology does not distinguish among primary, secondary, tertiary and n-nary accents: there is ONLY ONE ACCENT WITHIN AN ACCENTUAL UNIT. Another accent (other functional prominence) belongs to another accentual unit.

As mentioned, accent fulfills culminative function (and of course contrastive function, too). There are language with a fixed accent and languages with a free accent. In former languages accent can also acquire deliminative function. However, functionalists (and a few non-functionalists, too) do not commit the error of thinking that accent can be distinctive in languages in a fixed accent, sc. in such languages where there exists a variation between the placement of accent. But accent is NEVER DISTINCTIVE. That there are pairs of words like English *insult* (noun, accented on the first syllable) and *insult* (verb, accented on the second syllable) does not mean that accent is *per se* distinctive. What is distinctive is not accent but THE PLACEMENT OF ACCENT. This equals to saying that in a language with a fixed accent there ex-

ist several possible accentual patterns for a given phonotactic base. As users of the language can choose from among the patterns, there is an opposition between them and therefore a distinction.

Finally, by DIAEREME we roughly mean what others called *juncture*, *disjuncture* or the like. To the sphere of diaereme also belong Trubetzkoy's *Grenzsignale*; diaereme is meant to account for all positive boundary signals, in general for all marked boundaries between significant units. We defined diaereme as A CULMINATIVE PARA-PHONOTACTIC FEATURE WHOSE FUNCTION IS DELIMITATION OF PHONOTACTIC ENTITIES. Like accent, diaereme is also attached on a certain phonotactic base. In many languages the base corresponds a phonological form of a word, though it also may be a morpheme. Diaeremes indicate boundaries between these forms.

The contrastive and culminative nature of diaereme is achieved via the contrast between diaereme and phonological forms. The latter are peaks of prominence in an utterance and diaeremes are their negations. The difference between phonological forms and diaeremes can be compared to mountains (peaks of prominence) and valleys (absences of prominence). Like accent, diaereme cannot acquire distinctive function, since it is not opposed anything else. Words like *night-rate* and *nitrate* which are usually interpreted as minimal pairs showing an opposition between juncture and its absence are, we maintain, misinterpreted. The two words are of different structure and therefore we cannot establish a commutative opposition between diaereme (juncture) and its absence. For functionalists, diaereme or juncture is NEVER A PHONEME, NEVER A DISTINCTIVE UNIT.

That juncture has been found useful for a phonological analysis by many linguists of different theoretical orientations can be witnessed on the vast number of works that are referred to in this paper. Functionalists are also well aware of its usefulness. Martinet and Akamatsu operate with a so-called potential pause; Mulder with juncture, which is in fact our diaereme. The latter term was chosen for convenience.

The importance of diaereme is functional phonology lies in the fact that it accounts for many processes—it has a number of structural and realizational implications for the phonological system of a given language. By structural implications we understand those processes that affect phonological units in vicinity of diaereme. On the other hand, realizational implications refer to ways phonological units may be realized in vicinity of diaeremes. It is well known that the presence of a grammatical boundary, which we represent phonologically as a diaereme, may have great repercussions on functioning of the phonological system of a given language. This is what we want to grasp under the idea of diaereme.

There are numerous REALIZATIONAL IMPLICATIONS of diaereme but we did not discussed them in any special detail, since there are dealt with in many other treatises. We only would like to mention a glottal stop which functions as a signal of grammatical boundaries in many languages.

As to the structural implications of diaereme, these are of more interest for functional phonologists, since they affect the phonological structure of a given language. One of these is NEUTRALIZATION, a notion that, though employed in other phonological theories, is especially peculiar to functional phonology derived from Trubetzkoy. Functionalists operate with oppositions in phonology, a notion that is in fact more important than e.g. phonemes and other phonological units. An opposition can be operative but it can also be inoperative. If latter is the case, functionalists speak about neutralization. It may be a coincidence, it may not, but the truth is that neutralization processes generally take place in vicinity of a grammatical boundaries. Since this is a thing that should be taken care of in functional phonology, the existence of diaereme is, we deem, functionally justified.

Another justification is LIMITED DISTRIBUTION of phonological units. We mentioned the distributional unit as a means for stating the distribution of phonemes. In many cases and many languages the distribution of phonemes can be fully described with respects to grammatical boundaries. It is not an uncommon thing that a certain phoneme occurs only at the beginning or end of a word. Similarly, certain phonemes never occur in vicinity of grammatical boundaries. It is therefore the advantage of diaereme by which we can discover these specifics of phonemes and their distributions. Let it be noted that functionalists of Martinet's wing (not in fact of the post-Trubetzkoyan Prague wing, save for Trnka, cf. Trnka 1966) make a sharp distinction between neutralization and limited distribution.

We hope to have summarized the main points of our paper. Due to the limited space and its very nature, the present paper is more theoretical than descriptive. However, we believe a language theory should come before the actual description of a language. Without a theory, a language cannot be described. A language theory must, however, be also described and fully worked out. In our paper we introduce one possible language theory, a theory that we find, besides its appealing consistence, adequate for language descriptions. We concentrate on two particular aspects of the theory and hope to give a basis for further work and for actual descriptions of the phenomena of accent and diaereme in any given language.

SUPPLEMENT

NOTES ON DIAEREME

Dedicated to the memory of Adolf Erhart

[a pre-print version of Bičan forthcoming]

1. There are two passages that particularly stuck my mind when reading Adolf Erhart's excellent linguistic primer *Základy jazykovědy*[1]. The first was his classification of the grammatical category of case, and the other was his classification of phonological units. Others have already commented on the former, and I would like to make some notes on the second classification.

On pp. 38-9 Erhart gives the following table which represents a division of phonological units (translated to English):

segmental phonemes	segmental prosodemes
suprasegmental phonemes	suprasegmental prosodemes

Some comments are due to understand the classification.

i. Erhart follows a commonly accepted division of phonological units into segmental and suprasegmental ones. The segmental units are such units that are linearly grouped within an utterance, one after another. The suprasegmental units are superimposed on these units in such a sense that they form additional blocks and are placed upon one or a group of segmental units. Such are typically accent and/or intonation while the most typical segmental units are of course phonemes. Let it be noted that Erhart's use of the term *phoneme* corresponds to the practice of American descriptivists who spoke of segmental and suprasegmental phonemes; in the European tradition the term *phoneme* is usually restricted to segmental phonemes only.

ii. Erhart further divides phonological units according to a criterion whether they form a system or not. The first units are phonemes; the units that do not form a system are called *prosodemes*. This criterion derives from Erhart's commendable recognition of the difference between paradigmatic and syntagmatic relations. Although he, unfortunately, speaks about a contrast in both cases, it is better to distinguish between an opposition, being a relation between units on the paradigmatic axis, and a contrast, being a corresponding relation between units on the syntagmatic axis[2]. Now, pho-

nemes are such units between which we can postulate an opposition, and hence they form a paradigmatic system. On the other hand, we can postulate only a contrast between prosodemes, as they do not enter in any paradigmatic relation with other units, and they do not form any system in this respect.

Once I have made clear what criteria underlie Erhart's division, let us examine which units are which. I have already hinted that segmental phonemes are "classic" phonemes like vowels and consonants. One versatile with American descriptivists' division of phonemes will easily guess that intonation (or better tones) belongs among suprasegmental phonemes. One should perhaps rather speak about *tonemes* to underline their phonological status. Then, what Erhart regards as a suprasegmental prosodeme is *accent*. It is because of the fact that accent is either present or absent on a syllable; the accented syllable contrasts with unaccented syllables within a significant unit (a language unit having a meaning; usually a word).

Having come so far, Erhart poses a question whether there exists a segmental prosodeme that would correspond to accent, the latter being the suprasegmental prosodeme. At this stage he introduces a unit called *diaereme* (in Czech *dierém*) as a phonological means for signaling boundaries between sentences, words etc. The segmental nature of the diaereme, says Erhart, derives from the fact that it can be realized by a pause or by an independent sound—the so-called glottal stop. Now, this is a very interesting point in Erhart's theory that I would like to comment upon.

2. Despite the peculiarity of the term *diaereme*, the concept behind it is not unfamiliar to linguists. It is meant to account, more or less, for the same things as the concept American descriptivists called *juncture*. Since they were against using grammatical criteria for a phonemic analysis, they regarded junctures as a special kind of phonemes. The concept was used, for instance, by Henry Kučera in his phonological description of Czech[3]. However, recent phonetic (acoustic) research on the junctural phenomena showed that juncture (in particular what was called *internal open juncture*) as a phoneme is rather a "dead horse" because the differences that had previously been explained as resulting from different types of junction of phonemes (famous *night-rate* vs. *nitrate*) were rather "differences in grouping phonemes into syllables and/or manifestations of higher level requirement different from simple syllable-to-syllable transitions"[4].

Yet it need not mean that diaereme, if properly defined, cannot be a useful phonological concept. Phonology of American (Bloomfieldian) linguists was always practically oriented and their junctures, like their phonemes, were meant to correspond directly to actual sound features. Once these features were discovered to result from other factors, their junctures are

probably no longer necessary. But we can retain diaereme as a phonological construct, as a model that can account for various phonetic and phonological features that signal the boundaries of significant units.

Such was no doubt Erhart's intention. As far as I know he did not use it in any actual description of a language but his views have been adopted by his student Ondřej Šefčík who has actively used the concept of diaereme in his works. In one of his articles devoted to accent he spends some space on diaereme in Czech[5]. However, there are certain points in the presentation that I do not agree with; I will return to them in the third section of this paper.

First I feel necessary to reconsider the definition of diaereme. To begin with, I do not quite agree with the distinction between segmental and suprasegmental units and/or features. It is true that tones (tonemes) and accent are superimposed on segmental phonemes but languages can have features, normally viewed as pertaining to segmental phonemes, that are, as it were, also superimposed on phonemes. Let us imagine a language where a syllable contains either fully nasalized phonemes (i.e. a combination of a nasal and a nasalized vowel) or fully non-nasalized ones (i.e. a combination of an oral consonant and a non-nasalized vowel). Suppose that only one such nasalized syllable would occur within a word[6]. It should be clear that the function of this syllable would be the same as the function of accent, which also occurs in one instance only within a word. Though this is an artificial example, something similar can be found in some Indo-Aryan languages where aspiration is specifically distributed within words (so-called Grassmann's law): occurrence of aspiration signals the presence of a morpheme and occurrence of another aspiration in line signals the presence of another morpheme. This is given by the fact that only one aspirated sound can occur within a morpheme.

From the functional phonological point of view, i.e. from a point of view that considers various functions of the phonic substance, the distinction between segmental and suprasegmental may not be very useful as long as it refers to a phonetic, not functional, division of sound features. Jan W. F. Mulder[7] therefore suggested introduction of a so-called para-phonotactic level as a level that accompanies the phonotactic level (the latter pertaining to constituency of phonemes on the syntagmatic axis). Para-phonotactics accounts for most suprasegmental features but is certainly not limited to them. Once defined as features corresponding to phonological form, but not determining the identity of phonological entities (Mulder's definition), para-phonotactic features can successfully account for a number of features like accent or tones or nasalization in the aforementioned example. But these are not the only para-phonotactic features—sequential order of phonemes within a phonemic chain is also a para-phonotactic feature.

The primary function of accent is often described as culminative. This means that it marks the peak of prominence of certain significant units (usually words). In an ideal situation one can say that the number of such peaks equals the number of words within an utterance. Apart from this, there are certain features that are capable of indicating the number of words more precisely. There is probably no better way to point to existence of a word in an utterance than to show its boundaries. Such features are said to have a deliminative function.

Now, diaereme can be viewed as a phonological, precisely a para-phonotactic entity which would shelter and account for a large body of phonological features with a deliminative function. In many respects this corresponds to the diaereme as conceived by Erhart but his diaereme was defined in such a manner as to be bound to be of the segmental nature only. It is now a para-phonotactic unit that can be manifested by a segmental and/or suprasegmental unit.

Those familiar with the theory of juncture will know that there are several types of junctures recognized, from internal (open) juncture, external (open) juncture and terminal (open) juncture to close juncture (smooth transition from one sound to another). Though these may have phonetic justification, from the functional phonological point of view it is doubtful whether they should be distinguished. Diaereme is meant to be a boundary-signaling phonological unit contrasting with sequences of phonemes with no boundary and hence may be viewed as a cover term for all open junctures as contrasted with close juncture (sc. the absence of marked boundary).

3. I will now turn to some of the possible manifestations of diaereme. In the article "K (ne)pohyblivosti přízvuku (typologická poznámka)" (see note 5) Šefčík writes that diaereme, as a prosodeme defined by Erhart, can be generally realized (1) as a pause, (2) as the glottal stop, (3) as certain *sandhi* realizations (usually found, but not limited to Indo-Aryan languages), (4) as accent if fixed on a certain syllable, and (5) as a special realization of phonological components.

Although I do not intend to comment on all of these possible realizations or give many and extensive details (the latter would require a longer and more devoted exposure than this article can offer), I would like to make some points concerning some of the possible realizations of diaereme.

a The most obvious realization of diaereme is of course a pause. However, not every interruption of speech can be functional. Although speakers, if making pauses at all because speech is usually connected, place pauses across grammatical boundaries (usually word-boundaries), they can make a pause in the middle of a word, if they need to take a breath.

Such pauses are nevertheless highly disturbing, since the listener expects the pause to be at a grammatical boundary. So although pauses can be erratic in speech, we can still regard a pause as the most obvious realization of diaereme if it is meant to signal some kind of grammatical boundary. A linguist should be able to tell out a randomly placed pause from a functional one.

b It is not uncommon that in many languages a pause is used as a boundary-signal only at the very beginning and very end of a sentence. Yet there may be other phonic features that would signal boundaries of the constituting significant units of the sentence.

Though users do not usually know it about their language, linguists trained in phonetics are cognizant of certain sounds that can be found in a speech chain but are not distinctive. Such is the glottal stop that usually occurs before a word-initial vowel in Czech and other languages. Unlike in those languages (such as Arabic) where the occurrence of this sound can distinguish words, the glottal stop in Czech does not have this power. Yet it does not mean that it need not be functional. Since it occurs at the beginning of words with an initial vowel, its occurrence can mark the place where a new word is started. For that reason it may be regarded as a (segmental) realization of diaereme (already mentioned by Erhart) in Czech.

But the situation is not that simple. In Czech (note that every time I speak about Czech I mean standard Czech and orthoepic pronunciation) the glottal stop can also occur in the middle of what is usually viewed as one word. Consider these examples (the phonetic transcription has been simplified; ʔ stands for the glottal stop):

doopravdy [doʔopravdi] ‘really’

neustále [neʔusta:le] ‘continuosly’

To dub it in words, the glottal stop can also occur at junction of two vowels within a word. The condition is, however, that there must be a morpheme boundary. It does not occur in borrowed words like *chaos*; if it does, such pronunciation is not perceived as quire correct.

These examples prove that the glottal stop does not mark the beginning of a word. If it occurs, it marks a morpheme boundary; a boundary between words is usually a morpheme boundary, too. The problem is in the definition of the word. This is one of the most fundamental problems of linguistics. The traditional definition of the word as the minimum syntactically free form is not quite adequate even in syntax. What should we regard as a word? Should its boundaries be phonologically definable?

As to a possible phonological analysis of those Czech words, we can take two directions. Either we say that the occurrence of the glottal stop signals, not the beginning of a word, but a morpheme boundary. Then the traditionally upheld view that the glottal stop signals the beginning of a word cannot be maintained.

However, we can take another direction. The words like *doopravdy* can be regarded as two phonological words. Though this solution may appear as counter-intuitive, it is not in principle so unthinkable. First of all and once again, what is a word? Consider these examples (“ stands for stress):

neobyčejný [“neʔobičejni:] ‘unordinary, extraordinary’

ne obyčejný [ne“ʔobičejni:] ‘not ordinary’

pod oknem either [“podoknem] or [“potʔoknem] ‘under a window’

podokenní [“podokeňi:] adj. ‘being under a window’

nejostřejší either [“nejostřejši:] or [“nejʔostřejši:] ‘sharpest’ (*ostřejší* ‘sharper’, *nej-* the superlative prefix)

What is the difference between *neobyčejný* and *ne obyčejný*? It is obviously the position of accent; otherwise the two utterances are identical. However, the presence of accent on the first syllable in *neobyčejný* does not necessarily imply that it is one word. Cf. *pod oknem* which is generally regarded as a two-word utterance (this will be discussed below). And if this utterance is built up of two words, so is *nejostřejší*, especially if pronounced as [“nejʔostřejši:]. And how much is *podokenní* phonologically different from *pod oknem* if the latter is pronounced as [“podoknem]?

These are crucial questions that require a minute analysis and consideration. At this point I would only like to say that segments that behave grammatically as one unit can behave phonologically as two units (*neobyčejný*, *nejostřejší*). And *vice versa*: segments behaving grammatically as two units may behave phonologically as one (*pod oknem*). Consider also the fact that e.g. in an English word *orthodoxy* there are two instances of accent and the same accentual pattern as *underlying* or *under lying* (*Sophie*, sc. something is under Sophie who in a horizontal position); the syllable pattern is Accented-Unaccented-Accented-Unaccented is all three cases. Grammatically, *orthodoxy* does not consist of two morphemes (like *underlying*) or words (like *under lying*) but if it is true that accent in English occurs one per a word or morpheme, then *orthodoxy* behaves as a two-word or two-morpheme segment[8].

But to return to the possibility of diaereme being realized by a segmental sound: We can still maintain that diaereme is realized by the glottal stop in Czech but we should specify which units are delimitated by diaeremes—whether words or morphemes or something else. Also, the glottal stop need not be the only sound with this function (i.e. with a deliminative but not a distinctive function). We can easily imagine other sounds. For instance, in a language where sounds like [h], [v] or [w] (or in principle any other sound) cannot positively be shown to realize phonemes, yet would occur, like the glottal stop in Czech, before word-initial

vowels, then these sounds may be regarded as realizations of diaereme. In fact, the occurrence of so-called prothetic sounds is not an uncommon phenomenon.

c The situation envisaged in the last paragraph should not be confused with limited distribution of certain phonemes. For example, if the phonological analysis shows that the sound [h] is a manifestation of a phoneme /h/ and the distribution of the phoneme is limited to, say, the word-initial position, then it has a deliminative function (in addition to a distinctive function every phoneme has). Since its phonemic status has been proven, it cannot be a manifestation of diaereme, but like diaereme it has a deliminative function. However, we should be cautious here. We have to realize that saying that a phoneme occurs exclusively in the word-initial position presupposes we have registered boundaries of words, which might be sometimes a quite difficult task.

d It is well-known that the word-final position is a position of neutralization of the opposition between voiced and voiceless phonemes in Czech (phonetically speaking, only voiceless obstruents can occur at the end of a word before a pause). The same neutralization is found in Russian or German; other languages can have their own specific word-final neutralizations. What is the factor causing this neutralization? It is obviously the word-final position. The end of a word, its termination, which is signaled by a pause, is therefore phonologically relevant (functional). Phonology, viewed as functional phonetics, should deal with it, and it is diaereme that can account for it. The word-final position is then the position before diaereme and the word-initial position is the one after diaereme. The difference between the distinctive features 'voiced' and 'voiceless' is canceled before diaereme in Czech (and German and Russian).

e Another phonological means for signaling a grammatical boundary may be accent fixed on a certain syllable in a word. Czech is an oft-cited example having a fixed accent which fulfills this function. Because of this, Šefčík (*op. cit.*) regards accent as a realization of diaereme in Czech. This point needs to be examined.

It is generally asserted that any Czech word is always accented on the first syllable. Here I hasten to add that the word should be at least dissyllabic for accent to be functional—in monosyllabic isolated words a syllable, no matter if phonetically stressed or not, cannot be contrasted to any other syllable within the word. Also, it should be mentioned that here accent is viewed and defined as a certain prominence given to a syllable and only one syllable within an accentual unit. Accent is thus distinguished from stress, which may be one of possible manifestations of accent (melodic pitch, duration etc. are other possible manifestations).

There are a number of words in Czech that are not accented; these are certain prepositions and clitics (both of them tend to be monosyllabic, hence out of question). However, the rule

that a plurisyllabic word is accented on the first syllable holds unconditionally only when the word is in isolation (terminated by pauses). Though normally unaccented, certain prepositions acquire accent when combined with a noun. Consider these examples:

pod [pot] 'under'

okem ["okem] 'eye', instrumental

pod okem ["podokem] 'under an eye'

From the common-sense view of the word, we can easily see that the word *okem* is not accented at all in the third example. I have already hinted that this may be quite a problem. What is a word and how is it defined? The problem is usually undone by introducing a concept of the phonetic or phonological word which is defined as a segment containing one and only one accent (*orthodoxy* would then be two phonological words). We can then say that accent falls regularly upon the first syllable of a phonological word. However, this statement is tricky because it may be circular—we have just defined the phonological word as a segment containing one and only one accent!

Let us now return to the example ["podokem]. I can think of two possible analyses. We can either regard it as a single, phonologically unanalyzable entity (say, a phonological word) or as two entities. One of the arguments for the second analysis is the fact that once we regard it as two words, sc. once we place diaereme between [pod] and [okem], we can register neutralization of the opposition between voiced and voiceless phonemes. Viewed from the perspective of the speaker, we can say that when he wants to say 'under an eye' and use standard Czech, he will always pronounce either ["podokem] (or ["potʔokem] to which I will return presently). The orthoepic pronunciation does not give him any other option. Except for ["potʔokem] which is another argument for the suggested analysis[9]. I said that the glottal stop might be regarded as a realization of diaereme because its occurrence (almost) always marks the beginning of a word. The utterance ["potʔokem] is therefore phonetically marked as being composed of two words. The same neutralization process takes place before diaereme. This means that *pod okem* ought to be phonologically interpreted as /#"poT#okem#/ (T is an archiphoneme corresponding to the neutralization between 'voiced' /d/ and 'voiceless' /t/; # stands for diaereme). The archiphoneme /T/ would be realized either as [t] if the immediate diaereme is realized by the glottal stop or as [d] if it is not. There is no other choice.

This analysis shows that we can no longer claim that accent in Czech is a realization of diaereme. Not every pre-word diaereme would be realized by accent on the adjacent syllable, since /okem/ is not. For Czech, it is better to operate with two para-phonotactic units: accent and diaereme. Accent has primarily a culminative function but happens to have a deliminative

function by virtue of being fixed on a certain syllable. This deliminative function is more or less potential, since we have to know how to syllabify to set the precise boundary.

However, the degree of interconnectedness of accent and diaereme is so high in Czech that they almost merge in one unit. This is due to accent being fixed on a certain syllable. Yet there can be languages where accent is a realization of diaereme if its occurrence is connected with the placement of diaereme. This would be the situation in Czech if every initial syllable in plurisyllabic words were accented after diaereme. The diaereme would then be realized by a suprasegmental unit, which is a proof that diaereme need not be a purely segmental unit as Erhart defined it. It is better to speak of para-phonotactic units to avoid this contradiction.

Let me return to the first suggested solution, that is, to the one which regards [“podoknem] as phonologically unanalyzable. The argument for it is such that there is in fact no phonic feature which would mark the boundary. That there is neutralization can be found out only after we say there is a boundary. That one can say instead [“potʔokem] says nothing about the form [“podokem].

The form [“podokem] may be something that has been, to the best of my knowledge, little considered and discussed: a case of the syntagmatic counterpart of neutralization. Neutralization is the inoperability of a certain opposition, and an opposition is a paradigmatic relation. We can think of a process which accounts for the inoperability of a contrast (the reader should remember that this is the syntagmatic counterpart of the paradigmatic opposition). So if there is a contrast (i.e. a functional syntagmatic difference) between the diaereme and phonemes when *pod okem* is pronounced as [“potʔokem] (phonologically /#poT#okem#/), the contrast is neutralized when pronounced as [“podokem]. There may no longer be any operative difference between the diaereme and the phonemes.

The same situation may be envisaged for an English pair of utterances like *an aim* and *a name*. These utterances can be either pronounced alike as [ənɛɪm], or the first as [ən-ɛɪm] and the second as [ə-nɛɪm][10]. Phonologically, there is, firstly, diaereme in the latter case whose position distinguishes *an aim* from *a name*, and secondly, a contrast between the diaereme and neighboring phonemes. If the difference between the utterances is not maintained and both are pronounced as [ənɛɪm], phonologically /#ənɛɪm#/, the contrast which was postulated for /#ən#ɛɪm#/ and /#ə#nɛɪm#/ may perhaps be regarded as neutralized, since there would be no functional phonological difference between *an aim* and *a name* even though the difference is clearly grammatical.

f A note should be made on distinctiveness of diaereme. Diaereme, like accent, is not and cannot be distinctive. This possibility is ruled out by their definitions. To be distinctive means to be opposed to something else (in Erhart’s words: to form a paradigmatic system), which

diaereme is not. It is not distinctive even in an oft-cited Czech pair (*an aim* vs. *a name* may be a parallel English example):

spala [spala] 'she slept'

spal a [spalʔa] 'he slept and'

If we ignore artificiality of these examples (they would hardly occur in similar utterances or isolated to be mutually confusable), we can say that what distinguishes [spala] from [spalʔa] is the occurrence of the glottal stop in the latter. If we say that the glottal stop is a marker of the word-boundary, hence a realization of diaereme, we can interpret these utterances as being phonologically /#spala#/ and /#spal#a#/. It is obvious that the utterances have different phonological structures and are thus not mutually compatible and commutable (to be commutable means to be in opposition and in turn to be distinctive). Also, in the given position, i.e. in the position at the end of one word and at the beginning of another, the diaereme is not commutable with anything else, simply because it is the only unit to occur there.

Yet it cannot be denied that the two utterances are different. The difference is of course caused by the diaereme but not because it would, by itself, distinguish these utterances but because it is differently distributed. This is to say that what distinguishes utterances *spala* and *spal a* is the position of diaereme: in *spala* it is placed after the second /a/, in *spal* after /l/.

The same is true about non-distinctiveness of accent: once defined as a unit not entering into paradigmatic relations, it cannot be opposed to anything and hence cannot be distinctive. The difference between e.g. English *import* (noun, accented on the first syllable) and *import* (verb, accented on the second syllable) is not underlain by an opposition between accented and unaccented syllables, the difference lies in the position of accent. It cannot be said that the first accented syllable of *import* (n.) is opposed to the unaccented first syllable of *import* (v.), because in the latter the second syllable is accented whereas it is not in the former. That the two words are nevertheless different is given by a distinctive opposition between an accentual pattern Accented-Unaccented (*IMport*) and an accentual pattern Unaccented-Accented (*im-PORT*).

In languages with a fixed accent, the specific accentual pattern (e.g. if it falls upon the first syllable of a word) is not opposed to any other pattern and hence not even the position of accent can be distinctive here. Such is the situation in Czech, though the position of accent may be distinctive here in a marginal case. But it is not in the oft-cited cases (see e.g. Kučera *op. cit*., p. 53) like the following:

ta jemná dáma [ta"jemna:"da:ma] 'that fine lady'

tajemná dáma ["tajemna:"da:ma] 'a mysterious lady'

Here the difference is in the position of diaereme, not accent, since accent can still be said to occur on the first syllable of certain segments notwithstanding the fact that the segments may consist of more than one word (cf. *pod okem* [“potʔokem]).

I have had in mind another pair of words. Let us return to the difference between *neobyčejný* [“neʔobičejni:] ‘unordinary’ and *ne obyčejný* [ne “ʔobičejni:] ‘not ordinary’. If they are phonologically interpreted as /#“ne#običejní#/ and /#ne#“običejní#/, that is, if the glottal stop is regarded as a boundary-signal in Czech, then the difference between them lies in the position of accent. This analysis upheld, we cannot say that accent is completely fixed in Czech. This would be another proof that accent and diaereme are two para-phonotactic units in Czech.

Conclusion

In the above paragraphs I tried to comment on diaereme, a phonological unit that Adolf Erhart defined as a segmental prosodeme and that marks grammatical boundaries. The distinction between segmental and suprasegmental is not quite fitting in phonology and even less in case of diaereme, since it can be realized both by a suprasegmental unit (accent under certain circumstances) and a segmental unit (usually the glottal stop). It is advisable to introduce so-called para-phonotactics as a level corresponding to the phonotactic level. In turn, diaereme is to be defined as a PARA-PHONOTACTIC UNIT WITH A DELIMINATIVE FUNCTION (accent is a para-phonotactic unit with a culminative function and, for that matter, a phoneme is a phonotactic unit with a distinctive function).

Diaereme can be realized in many ways, ranging from a pause, a segmental sound, a phonological process (such as neutralization) to suprasegmental features of syllable-prominence which normally realize so-called accent if the latter is fixed on a certain position and the position is derivable from the position of diaereme. Such might be the situation in Czech, since the syllable-prominence (stress) is generally said to occur on the first syllable. However, this is rather simplified, since distribution of Czech stress is much more peculiar and though it occurs on the first syllable of a word, not every word which beginning is phonologically marked by diaereme is stressed on the first syllable (as utterances like [“potʔoknem], /#poT#oknem#/, “under the window” and [“neʔobičejni:], /#ne#običejní#/ “unordinary” prove). In Czech ACCENT OR STRESS IS NOT A REALIZATION OF DIAEREME, though it is capable of marking a certain type of boundary.

Although it is ruled out by the very definition of diaereme as a unit not entering into paradigmatic relations, which is a condition for distinctiveness, many people still think that diaereme can distinguish between words. This can only be true if it is correctly meant as that THE

POSITION OF DIAEREME CAN BE DISTINCTIVE AND CAN DISTINGUISH BETWEEN WORDS as can be is nicely seen on the English pair *an aim* /#ən#ɛɪm#/ and *a name* /#ə#nɛɪm#/ where both items are built of the same phonemes and only the *position* of diaereme (i.e. a word-boundary) is different.

Appendix: Origin of the term dierém

Erhart used the term *dierém* for a phonological unit he viewed as a segmental prosodeme without specifying the origin of the term. Although it is not mentioned in the book, the term must be borrowed from the Moscow School. It seems to be introduced for the first time in an article "О разграничительных сигналах в языке" ['On boundary-signals in language'] by М. В. Панов [M. V. Panov] (*Вопросу языкознания* [*Voprosy jazykoznanija*] 10, 1961); the author speaks here about *диэрема* [*dierema*]. Though the article is not mentioned in his book, Erhart must have adopted it to Czech therefrom, and coined the form *dierém* on the analogy with *foném* etc. (*dieréma* would also be possible but the *–éma* suffix, if used in e.g. *Travaux du Cercle Linguistique de Prague* IV (1931)[11], was soon replaced by *–ém*).

Panov did not mention what stem/word underlies the term *dierema* but there can be little doubt that the word is related to Greek words *διαιρεσις* [*diairesis*] "division" and *διαιρέω* [*diairéo*] "divide, separate". Though the suffix *–ema* was meant to reflect other *–ema* terms in linguistics (like *фонема*, *монема* or *хронема* [*fonema*, *tonema* or *chronema*] mentioned by Panov himself, *op. cit.*, p. 6, n. 8) and hence standing for something like "a systematic unit signaling divisions/boundaries", there is nevertheless a Greek word *διαιρημα* [*diairēma*] meaning either "part divided, division" or "logical division"[12].

Now as to the English variant of the term: The word as such is not current in English usage, and Russian *dierema* seems to be substituted by *juncture* in translations. The only mention I have been able find is in Eli Fischer-Jørgensen's *Trends in Phonological Theory* (Copenhagen, 1975). When discussing Soviet contributions to phonology, the author briefly overviews the aforementioned article by Panov and uses a plural form *diaeremes* (p. 362). In fact, little is said about the article except for the term and a function diaeremes are meant to convey.

Curiously enough, the index to *Trends* gives the form *dieremes* (p. 458). Although one of the forms is clearly a misprint, because they refer to one another, the variation between *diaereme* and *diereme* need not be *per se* unfounded. The English word *diaeresis* (sometimes spelled even *diæresis*), borrowed from Greek *διαιρεσις* via Latin *diæresis*, has a variant spell-

ing *dieresis*, which is more common in North America. Hence *diereme* is thinkable, too, but the spelling *diaereme* has been used here mostly for aesthetic (or esthetic?) reasons.

Notes

[1] Adolf Erhart, *Základy jazykovědy*, Praha, 1990, 2nd edition.

[2] The thought behind the difference between the opposition and contrast is naturally not new. The terms, however, were used for the first time, as far as I know, in Roman Jakobson's "On the Correct Presentation of Phonemic Problems", published in *Symposium* 5, 1951. It was reprinted in the author's *Selected Writings* I (The Hague, 1961) under the title "For the Correct Presentation of Phonemic Problems".

[3] Henry Kučera, *The Phonology of Czech*, 'S-Gravenhage, 1961. For certain reasons he uses the term *disjuncture* instead.

[4] J. E. Hord, "Juncture and syllable structure of English", *Phonetica* 15, 1966, pp. 104-5, cited by Ernst Pulgram in *Syllable, Word, Nexus, Cursus*, The Hague – Paris, 1970, p. 111.

[5] Ondřej Šefčík, "K (ne)pohyblivosti přízvuku (typologická poznámka)", *Čeština – univerzália a specifika* 4, Praha, 2002. Also published in Linguistica ONLINE <http://www.phil.muni.cz/linguistica/> at this address: <http://www.phil.muni.cz/linguistica/art/sefcik/sef-002.pdf>.

[6] The example taken from André Martinet, *Phonology as Functional Phonetics*, London, 1949, p. 11.

[7] See for instance Jan W. F. Mulder, *Foundations of Axiomatic Linguistics*, Berlin – New York, 1989, pp. 449-51.

[8] Cf. André Martinet, *Éléments de linguistique générale*, Paris, 1991, 3rd edition, section 3.35. Note that stress, as one of the manifestations of accent, can be primary or secondary. Accent is either present or not, but there is no hierarchy.

[9] Let it be noted that under certain circumstances [pot"ʔokem] is possible, too, but not if *pod okem* is pronounced isolated and without any special emphasis.

[10] The transcription is rather simplified. The dash is to indicate that there is a difference between the utterances. However, the difference is not due to presence of a special allophone of juncture (namely internal open juncture) but due to special word-initial and word-final allophones at the either side of boundary (see Pulgram, *op. cit.*, p. 113).

[11] In "Projet de terminologie phonologique standardisée", for example p. 311.

[12] Taken from *A Greek-English Lexicon* (compiled by H. G. Liddell and R. Scott, revised and augmented by H. S. Jones, Oxford, 1940).

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A few of the works in following list is indicated as 'not consulted'. These works were not available to us before the present paper was finished but are known (by being cited by other writers) to be important for the topics of this paper. We want to give readers a chance to judge the works for themselves.

Abbreviations:

PICPS *Proceedings of the International Congress of Phonetic Sciences*
SIL *Studies in Linguistics*
SPFFBU *Sborník prací filozofické fakulty brněnské univerzity*
TCLP *Travaux du Cercle Linguistique de Prague*

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