Phoneme in Functional and Structural Phonology[*]
Aleš Bičan

INTRODUCTION

The aim of this paper is to examine, as far as the space permits, various definitions of a linguistic concept known as the *phoneme*. During the course of time there have appeared several definitions of this concept. As there have been many linguistic schools, virtually every one of them has put forth its own definition of the phoneme. It is not, however, the goal of this paper to examine all of the definitions of the phoneme (it would be a rather long treatment). The purpose of this work is to concentrate on one particular stream of thinking: Functional and Structural phonology. While, as will be shown below, certain definitions of the phoneme are mutually incompatible and represent different approaches, we can register a gradual and self-improving development of the concept of the phoneme within the scope of the phonological theory of Functional and Structural phonology. The present paper will attempt to map, though not exhaustively, the development and provide comments on various definitions within this school.

PHONEME

There can be hardly any doubt that every student of phonology, and of linguistics in general, will come across, sooner of later, the notion and concept of the *phoneme*. Probably sooner than later. The phoneme can adequately be regarded as one of the most important concepts of linguistics, perhaps the most important one after the concept of the *morpheme*, the minimal linguistic union of *signifié* (signified) and *signifiant* (signifier)— the *signe* (sign).

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[*] A slightly revised version of what was originally submitted as a minor thesis at the Department of Linguistics, Masaryk University, Brno, 2004. Reproduced with permission. [Editor's note]

Indeed, almost every introductory book or text to linguistics will mention the concept of the phoneme. However, the concept of the phoneme remains usually unknown to the students of the secondary schools, though it may be sometimes mentioned (it certainly remains unknown to the students of primary schools). One of the reasons why the phoneme theory is not usually taught at secondary schools is most likely its peculiar nature. As suggested, it is no doubt a highly important concept for linguists (and other scholars), but the concept of the phoneme proper remains nevertheless somewhat "hard to imagine". As we know from the most usual definitions of the phoneme (though some of the definitions will be shown to be mutually refuting each other in the present paper), the phoneme is some kind of abstraction of the real sound that we hear.

A natural question may arise: why do we need any abstraction in, say, the word *kytice* "a bunch of flowers" if what we hear at the beginning of the word is the sound *k* and it is the same sound as in the Czech word *kuře* "chicken"? This is what a layman would most likely maintain. The linguists, however, know (being enforced by the findings of phonetics) that the sound of *k* in *kytice* and the sound of *k* in *kuře* are not actually the same sounds. The sound *k* is normally described, in articulatory terms, as a voiceless dorso-velar occlusive. This is however an ideal or neutral state. The variety in *kytice* is a fronted one whereas the variety in *kuře* is a backed one. Phonetically, that is articulatorily, acoustically or auditorily, the two sounds are different.

Yet why do we Czechs tend to treat these two sounds as the same entity? The psychologists may say that both sounds refer to one image in our brain. This image is some kind of abstraction—a certain abstraction like the phoneme! Indeed, early definitions of the phoneme were based on psychology. Later the psychological aspect was rejected and abandoned and the phoneme became perceived purely as an entity of the newly-formulated linguistic field—*phonology* (or phonemics). The phoneme has become once and for all a phonological (resp. phonemical) unit.

DEFINITIONS OF THE PHONEME

As hinted in the preceding section, there are several characterizations and/or definitions of the phoneme. Yet this very fact remains to a large extend neglected. As the phoneme is generally introduced in university studies, it is as a rule mentioned in introductory courses to various philological fields of study. Students are introduced to the term and notion of phoneme, and this notion is later referred to and students are even entitled to know and to explain what the phoneme is at various examinations. Students, teachers and general academic community speak about, refer to and operate with the phoneme. Once one gets used to the peculiar concept of the phoneme as some kind of abstraction, the concept becomes no longer unusual and is indeed easy to speak about, refer to and operate with. However, having been exploring the "secrets" of phonological and logical theories, I have figured out the things are not as easy as they seems to be.

Let us now examine several of primers to linguistics to see how the phoneme is actually defined and/or characterized.

The first primer to be examined is *Jazyk a jazykověda* by František Čermák (2001). The phoneme is characterized in the following manner:

Foném je […] minimální systémová jednotka nesématická (resp. „podsématická"), avšak funkční, schopná rozlišit význam (tj. v kombinaci s jinými ve vyšších jednotkách). […] Schopnost fonému rozlišit význam se chápe jako minimální a stačí, když se realizuje aspoň mezi dvěma slovy (minimální kontrast); ve funkčním pohledu se tato jeho schopnost chápe jako **distinktivní funkce**. (106) [**Phoneme** is […] the minimal non-semantic (or "subsemantic") unit of the system, yet functional, capable of distinguishing the meaning (i.e. in combination with others in upper levels). […] The ability of the phoneme to distinguish the meaning is understood as minimal and it is sufficient if it is realized at least between two words (minimal contrast); from the functional point of view this ability is understood as **distinctive function**. (our translation)]

A few pages later this definition is being referred to when another definition (or an extension of the former) is given:

Foném […], funkční jednotka daná souborem distinktivních rysů, je dvojího druhu, segmentální a suprasegmentální; obojí je abstraktní povahy. Segmentální fonémy (obv. však jen fonémy) mají úzký vztah k hláskám jakožto ke svým variantám […]. (112) [**Phoneme** […], a functional unit defined by a bundle of distinctive features, is of the twofold kind, segmental and suprasegmental; both are of the abstract nature. The segmental phonemes (usually only phonemes) are closely related to sounds as to their variants […] (our translation)]

The first part (which, however, I think is a separate definition of the phoneme instead) of the definition is not at all difficult. The phoneme is recognized as a "non-semantic" (or "sub-semantic") unit, which in other words means that the phoneme has only its form and no content (unlike the sign which has both). The distinctive function of the phoneme is likewise easy to understand: it is a minimal unit with capability of *distinguishing* the meaning between at least two words (properly speaking between at least two signs or variants of signs, see the footnote 1).

A problem arises when the second part (in my view another definition of the phoneme) is taken into context. The key term here and at the same time the weak point of this definition is "soubor distinktivních rysů". A list of these features is given on the pages 114 and 115: the Jakobsonian binaristic features. I have deliberately excluded the attribute "distinctive", because once the phoneme is treated as a minimal non-semantic (or "subsemantic") unit of the system with distinctive function, the distinctiveness of "distinctive features" is denied. I believe that distinctive features, by their own name, should be capable of distinction, and if *distinctive* means *capability of distinguishing* and if the phoneme is once declared the minimal distinctive unit, it cannot be a bundle of distinctive features, because being itself a *minimal* distinctive unit, it cannot comprise

more minimal distinctive units. This phoneme cannot be at the same time the minimal distinctive unit (that is, a unit with distinctive function) and a bundle of distinctive features. Therefore I believe the two parts of definition of the phoneme are actually two different definitions of the phoneme that mutually contradict each other (unless, of course, the distinctive features in question are not at all distinctive).

Although I have found here a lapse in logic (which nevertheless may in turn be a lapse in login on my part), a student of linguistics need not notice this contradiction until he examines the problem further. The characteristic of phoneme as being capable of distinguishing between two or more words is obvious, because it is the very reason of linguists' operating with the phoneme (as mentioned above, the difference between a fronted *k* and a backed *k* does not have any distinctive function in Czech). The notion of distinctive feature is rather fuzzy and misleading if it is not properly defined, though.

Another introductory textbook to linguistics is a collection of linguistic papers *Rudiments of English Linguistics* edited by Pavol Štekauer (2000). The Chapter 1 entitled *Phonetics & Phonology* was written jointly by Ludmila Urbanová and Jana Chamonikosová (the extracts cited were written by the first one).

The phoneme is the basic unit of the phonological level of language. It is a complex of phonic features, i.e. articulatory, acoustic and auditory features, which enables the users to differentiate a certain sound, on the basis of complex of features, from every other sound as an independent, non-interchangeable unit capable of meaningful distinction. By means of the substitution of one phoneme for another, the meaning of a word can be changed […].
Thus phonemes are abstract units based on the generalization of the basic and, for the given language, characteristic qualities of certain types of sounds.
A sound is a non-recurrent phonic phenomenon. (10-11)

The characterization goes on with a description of the features (i.e. distinctive features):

The features of phonemes are determined on the basis of their relations within the phonological structure. Mutual relations between two phonemes, established according to their similarities and differences, are called **phonological oppositions**. Phoneme features are divided into two basic groups:
    (i)   relevant features: the presence of which enable the phonemes to distinguish the meaning of words; consequently, these features are called **distinctive features** as they distinguish the meaning of words
    (ii)   irrelevant features: these features accompany the distinctive features; but their presence cannot influence meaningful distinction[.] (11)

This definition characterizes the phoneme as the same entity as has been done by Čermák in his second definition cited above. The phoneme is a bundle of phonic features that are capable of distinguishing two or more words (signs). These features are called distinctive features and their identity is established on the basis of phonological

oppositions. The whole picture, however, gets blurred in the subsequent section *Materialization of Phonemes*. With regards to materializations, i.e. realizations, the phoneme is characterized in two different ways:

1. "A phoneme is phonically signalled by a sound. One phoneme can be materialized by several sounds which are called allophones or phoneme variants." (11)

2. "A phoneme is a class of allophones." (*ibid*.)

The two characterizations are apparently meant to express the same thing, sc. that the phoneme, a phonological entity, is realized by a number of sounds, phonic entities, by which the phoneme becomes materialized and acquires its existence. It is true that a set of these realizations (sounds) naturally forms a class but the class itself cannot be identified with the phoneme. There is a crucial difference between phoneme being realized by a class of sounds and phoneme being a class of sounds/allophones. In the former case, at every instance of an actual utterance a phoneme is realized by only one sound from a class of sounds by which it is realized in other instances. In the latter case, "the class of allophones" is somewhat misleading. The phoneme can be either understood as being always a class of sounds, which is untenable, because only one sound can be uttered at a given instance of time, or as being identified with one sound from a class of sounds which form together the phoneme. However, the phoneme, a phonological entity, cannot be identified with a sound, a phonic entity, once distinction between the two has been made (see above for the first quotation from the textbook in question).

As is apparent, the problem lies in the assertion that "[a] phoneme is a class of allophones". Yet the characterization itself is not problematic—it is the forced incorporation of this characterization into the view of the phoneme as 1) a phonological entity different to the sound and as 2) a bundle of distinctive features that leads necessarily to contradictions. These two views, which are supposedly fully legitimate within their theoretical frames, are mutually incompatible. The concept of the phoneme as a class of allophones was introduced by Henry Jones and later adapted by Leonard Bloomfield and his adherents. The concept of the phoneme as a bundle of distinctive features was put forth by the Prague School.

The last introduction to linguistics that will be examined is *Základy jazykovědy* (1990) by Adolf Erhart. This remarkable introduction is one of the very few that recognizes and informs its readers about the fact that there are several definitions of the phoneme and not only one that is *the* one. Erhart, familiar with a great many of linguistic theories and writings (though not always crediting them), mentions five different definitions of the phoneme:

Základní jednotka zvukového podsystému – f o n é m – je definována různými školami různě:

a) Foném = minimální jednotka zvukového plánu jazyka, sloužící k vytváření a rozlišování významových jednotek jazyka – morfémů a slov.[1]
b) Foném = třída hlásek (realizací fonému) = třída alofonů.
c) Foném = svazek distinktivních vlastností (rysů). Distinktivními vlastnostmi (rysy) rozumíme ty fonetické vlastnosti, které jsou společné všem realizacím daného fonému.
d) Foném = zvuková (akusticko-artikulační) představa, uložená v lidské paměti.
e) Foném = relační jednotka, určená vztahy k jiným jednotkám téhož podsystému (foném A = nonB, nonC atd.). (37-38)
[The basic unit of the phonic subsystem – phoneme – is defined variously by various schools:
a) Phoneme = the minimal unit of the phonic plane, used to forming and distinguishing semantic units of language – morphemes and words.
b) Phoneme = a class of sounds (realizations of the phoneme) = a class of allophones.
c) Phoneme = a bundle of distinctive features. By distinctive features we understand those phonetic features which are common to all realizations of the given phoneme.
d) Phoneme = a phonic (acoustico-articulatory) image stored in the human memory.
e) Phoneme = a relational unit, given by its relations to other units of the same subsystem (phoneme A = nonB, nonC etc.) (our translation)]

As stated at the beginning of this paper, there are several definitions of the phoneme but not each and every one is recognized in introductory textbooks. The situation is different in this case but on the expense of which, the textbook becomes a little bit complicated and perhaps even bewildering. A student of linguistics may right ask which of these definitions the "real" definition of the phoneme is. Luckily but very unfortunately he is subsequently assured by Erhart that:

Tyto různé definice fonému se navzájem nepopírají, ale spíše doplňují: každá z nich postihuje určitý aspekt jednotky zvané foném. Definice a) vychází ze základní funkce fonému jako jednotky tzv. druhé artikulace, tj. zvukového plánu jazyka. Definice b) a c) se vztahují k realizaci fonému, postihují vlastně materiální charakter této realizace. Definice d) se vztahuje ke způsobu uložení fonému v paměti. Definice e) zdůrazňuje charakter fonému jako jednotky systému. Žádná z těchto definic by ovšem neměla být absolutizována, neboť to vede k jednostrannému pohledu na foném. Nežádoucí je zejména absolutizace algebraického pojetí fonému (e): znamená vlastně chápání jazyka jako systém čistých vztahů, tedy jako odtržení od materiální substance. V určitých případech je nicméně takovéto pojetí fonému užitečné, a to zejména v oblasti diachronické fonologie (vysvětlování cyklických mutací fonému apod.). (38)
[These various definitions of the phoneme do not contradict one another, quite contrary, they supplement each other: each of them is concerned with a certain aspect of the unit called

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[1] It should be noted that this definition of the phoneme fails to acknowledge the ability of the phoneme to distinguish between morphs (being various manifestations/variants of the morpheme) of one morpheme. Consider Czech /vlci/, spelled *vlci*, and /vlki/, spelled *vlky*. Although the morphological difference lies in the morpheme /i/ (in *vlci* being the nominative plural; in *vlky* the accusative plural), the phonological difference lies in the opposition between /c/ and /k/.

phoneme. Definition a) is based on the basic function of the phoneme as a unit of the so-called second articulation, i.e. of the phonic plane of language. Definitions b) and c) refer to the realization of the phoneme, which actually concern the material character of this realization. Definition d) is concerned with the way the phoneme is stored in the memory. Definition e) highlights the role of the phoneme as a unit of the system. None of these definitions, however, should be absolutized, since this would lead to a one-way look at the phoneme. Not desired is especially absolutization of the algebraic view of the phoneme (e): it means in fact understanding language as a system of pure relations, that is, a departure from the material substance. In certain case this view is nevertheless useful, in particular in the sphere of diachronic phonology (explanation of cyclic mutations of a phoneme etc.) (our translations)]

The assertion that the definitions do not in fact mutually contradict each other but supplement instead is highly unfortunate. I have already shown, for instance, that definitions (b) (phoneme as a class of sounds) and (c) (phoneme as a bundle of distinctive features) cannot refer to one and the same entity—the phoneme—because the phoneme cannot be at the same time a class of sounds and a bundle of distinctive features.

The statement of non-contradiction of these definitions should only be understood in such a sense that each of the definition refers and aims to describe a certain phonic reality that is always the same. The sameness in this context is to be understood as one concrete entity at a given instance of time. To give an example, the phonic entity by which the copulative conjunction of Czech is realized, i.e. *a* "and", is a concrete entity at a given instance of time when it is pronounced. How the entity is described within a certain theory depends on the theory itself. The entity, however, remains always the same at the given time.

To give an illustrative parallel, let us take mathematics, in particular algebra. The algebra is a certain theoretical system with its units and operations that helps us describe the outer world. We can, and mathematics actually does, imagine different systems with different units and operations. If we have one apple, we express the apple by an algebraic entity "1". The addition of another apple, i.e. another algebraic entity "1", is expressed by the operation "+". The procedure is expressed as "1+1". The final outcome—two apples—is expressed by another algebraic entity "2". What has been described above can however be expressed by other means in a different theory. The reality of the apples will nevertheless will the same.

The particular definitions of the phoneme should therefore only be understood as legitimately valid within the scope of the theories in which they were put forth but mutually incompatible. Every theoretical system has its own sets of axioms, postulates, definitions and derivational apparatus which, as a whole, are exclusive to one particular theoretical system only. Although some of the theories can be compatible, we cannot assume general compatibility for each and every system.

We must remember that though different textbooks offer us several definitions of the phoneme, it does not mean that there is one phoneme that can be described in various

manners. The phoneme *itself* is in most cases conceived as a description of the phonic reality. And it is just this phonic reality that is, at a given time, constant, real and material. The phoneme has been introduced to linguistics to be a model by which we could describe this phonic reality. The model has been built differently by different phonological schools but unfortunately the model has almost always been given the name *phoneme*[2]. Once different things are called by the same name, confusion is inevitable.

Nevertheless, if a scholar of linguistics realizes this, confusion may be evaded. He may be concentrate himself on particular definitions of the phoneme, that is, on particular schools of phonology, compare these schools and find out pros and cons of each of them. By doing so, he can make for himself his own choice and decide which phonological theory is the most apt one, which he will follow and consequently which he may better to be more efficient, consistent and exhaustive. Alternatively, he can come up with a brand new phonological theory.

FUNCTIONAL AND STRUCTURAL LINGUISTIC SCHOOL

Before the actual definition of the phoneme and its development in Functional and Structural phonology is examined, it is necessary to explain first what is meant by the very term *Functional and Structural linguistics*.

There exist many linguistic schools that are, either legitimately or not, ascribed with the attributes *structural* and *functional*. In particular, the latter attribute is often applied to various domains of linguistics as some kind of a fancy adjective. It is necessary to identify the Functional and Structural linguistic school and its theoretical stance from the outset in order to avoid confusion. One cannot suppose that all scholars will know what the Functional and Structural linguistics actually is, although they may already be familiar with the school proper and its theories. The present situation is indeed somewhat confusing and this confusion goes ultimately down to the question of terminology. It is perhaps nowhere else as grievous as in linguistics where one name is given to many things and one thing is called by a number of names. And if the same thing is called by different names (and this is also true for the question of the phoneme!), confusion is ready to arise. Take for example the group of linguistics such as Charles Hockett, Zellig S. Harris, Kenneth L. Pike: although at the same time the same people, they are variously called as (Post-)Bloomfieldians, (American) Structuralists and Descriptivists (cf. Fischer-Jørgensen 1975, Chapter 6 and Černý 1996, Chapter 10). One familiar with

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[2] One of the exeptions being Louis Hjelmslev and his glossematic theory. Within this theory the basic unit of description of the *signifiant* aspect of the sign is *taxeme* which roughly corresponds to the phoneme (see Hjelmslev 1963:99-100; cf. also Fischer-Jørgersen 1975: 7.14).

theories of Bloomfieldians may declare to be ignorant of theories of American Structuralists.

Although the word "structuralist" has been mentioned at the end of the preceding paragraph, the theories developed by the linguists such as Hockett, Harris or Pike are not what we will be concerned with here. It is true that Post-Bloomfieldians (or whatever they are called) are structuralists in such a sense that they believe that language is some kind of structure or system but they are not concerned with functions in the proper meaning of the word as the adherents of Functional and Structural linguistics are.

The Post-Bloomfieldian linguists (as well as their mentor Bloomfield himself) were influenced by teachings of a Swiss linguist Ferdinand de Saussure. As has already been hinted, one of his dicta was the idea of or belief in any language's being "conceivable as a kind of structure (or system) consisting of its interlinked sub-structures (sub-systems)" (Akamatsu 2001:1768). This idea and/or belief is shared by several and in many respects different linguistic schools: aside from the Geneva School (de Saussure and his pupils) and the Bloomfieldian School, the Glossematic School (associated with the name of Louis Hjelmslev) and the Firthian School can be mentioned. The Functional and Structural linguistic school is, as the name must already have hinted, inherently concerned with the structure or system of the language and therefore shares its uttermost influence by de Saussure with other already-mentioned Schools. Other influences are different.

Quite a great deal of length has been spent on description of the background of the Functional and Structural School without identifying the School *per se*. The identification of the School is not, however, as easy at it may seem, because as things have come to happen, the Functional and Structural linguistic school is not one monolithic body. In fact, we could or should speak about several (at least two) separate Schools: the Prague School and the Functionalist School. The situation proper even among the Functional Structuralists does not seem to clear. Tsutomu Akamatsu, who may be rightly regarded as the current leader of the Functional and Structural linguistics (at least of Functional and Structural phonology), speaks about Praguians and Neo-Praguians in Akamatsu 1988 but about two separate schools, The Prague School and The Functionalist School, in Akamatsu 2001. In order not to ponder over the terminology, I will give a brief overview of the history of the Functional and Structural School.

The Functional and Structural linguistic school is generally associated with the Prague Linguistic Circle (Pražský lingvistický kroužek/Cercle Linguistique de Prague), a group of young linguists of various nationalities who concentrated themselves around Prague. The name of the school, which was formed by these linguists, was coined at the First International Congress of Linguists in The Hague in 1928. The Prague Linguistic Circle itself was founded at least two years before the Congress when the first meeting of the Circle took place on 6 October 1926. The initiator and founder of the Circle was Vilém Mathesius with Nikolaj Sergejevič Trubetzkoy and Roman Jakobson as co-founders. These three persons (in particular the latter two) have entered undeniably into

general knowledge and have played a major role in the development and the course of the linguistic science. Other important members of the Circle were Bohumil Trnka and Josef Vachek.

The emergence of the Prague School and its theories were mainly a consequence of "both a negative reaction to the still then reigning Neogrammarian doctrine and in a positive reaction to Saussure's teachings" (Akamatsu 2001:1769). The aim of the School was to follow de Saussure's distinction of the language synchrony and diachrony and treatment of language as a structure or system. Although many linguistic fields were studied, the strongest attention was put to the distinction between phonetics and phonology and consequently to studying and expounding the latter science.

Although various members (being of various nationalities) of the Circle were operating in various places, the activity and regular meetings of the Circle were associated with Prague and Czeckoslovakia in general. When World War II was about to happen and the occupation of Czeckoslovakia had taken place, the Circle, as many other things, were doomed to cease. The year 1939 meant indeed the end of what may be called the classical era of the Circle. Ironically enough, at the same year the most important writing (and certainly one of the most important works of linguistics at all) was published: *Grundzüge der Phonologie* by N. S. Trubetzkoy. It was published posthumously, as Trubetzkoy died a year before. At the same time the other most important person of the Circle, Roman Jakobson, emigrated from Czechoslovakia.

Although the remaining members of the Circle still held lectures until 1948, the classical period of the Circle was over. Again curiously enough, one of the most widely known specifics for which the Prague phonology is remembered, i.e. the theory of neutralization and archiphoneme, is said to have been abandoned by 1939 (precisely after the publication of a truly magnum opus *Grundzüge der Phonologie*) (Vachek 1960:18). Although some of the members of the original Circle (such as Vachek and Trnka) published several works on phonology, the main attention was put to study of morphology, syntax and typology. Phonology became progressively neglected and the same situation has remained until the present day.

At the heyday of activities of the Prague School, the Circle had a great influence over the whole world. Although not a member of the Circle himself, a French linguist André Martinet contributed several times to the Circle's official journals *Travaux de Cercle Linguistique de Prague* (generally known as *TCLP*) and *Slovo a slovesnost* on various topics that had been previously expounded by the members of the Circle. The most important contribution was an article called *Neutralisation et archiphoneme* published in *TCLP 6*, pp. 46-57. Both the notions of neutralization and archiphoneme, as already mentioned, were created and worked out by the Prague School. As Akamatsu (1988:436) puts it, "judging from his own words, Martinet found his linguistic outlook to be in sympathy with the Prague Linguistic Circle's rather than that Martinet was influenced by the Prague Linguistic Circle". It is nevertheless obvious that Martinet took and reworked many of the notions and theories of the Prague School (as an example the theory of

neutralization and archiphoneme may be taken) and living in better and more peaceful environment, he founded a branch of the Functional and Structural linguistics that is sometimes called Neo-Praguian (cf. Akamatsu 1988) and sometimes just the Functionalist School or simply Functionalism (cf. Akamatsu 2001). No matter how it is called and though with the same background, the Functionalism represents today a separate linguistic school and is in many respects different to the present day linguists that are concentrated around the renewed edition of *TCLP*. As regards the field of phonology, the present writer regards the Functionalism to be the true continuation of Functional and Structural phonology and it is the stance of the Functionalism that will be examined in the present paper.

If the Prague School is associated with a number of names, the Functionalism is, if recognized at all, mostly associated with the name of André Martinet. Although he has written the most important works concerned with theories of the Functionalism (or better, creating the theories within the works) and of Functional and Structural phonology of the post-Trubetzkoyan era as such, he is certainly not the only person to be associated with the Functionalism. He had many pupils and has had many adherents throughout the world. A number of people may be mentioned: Jan W. F. Mulder, Niels Davidsen-Nielsen, Robert Vion, Eric Buyssens, Henriette Walter and at last, though most importantly as regards Functional phonology, Tsutomu Akamatsu (see Akamatsu 1988:16-17).

PHONEME IN FUNCTIONAL AND STRUCTURAL PHONOLOGY

THE PRAGUE SCHOOL

As noted above, the present paper will concentrate on the development of the concept of the phoneme in one particular linguistic school—the Functional and Structural linguistics, precisely in Functional and Structural phonology, as phonology is a study, *inter alia*, of the phonemes of a given language. The Prague Linguistic Circle was formed in 1926. We can take this year as the beginning of Functional and Structural phonology. As hardly anything is static, also this type of phonology has undergone a substantial development since then, be it either during the work of the members of the Prague Linguistic Circle themselves or by adoption and ameliorations of its concepts by the Functionalist School led by Martinet.

One of the first definitions of the phoneme appeared in so-called "Thèses" that were published in the first volume of *TCLP*, pp. 1-29 in 1929, i.e. three years after the formation of the Circle and one year after the First International Conference of Linguists in The Hague. The definition reads:

> [phonemes are] des images acoustico-motrices les plus simple et significatives dans une langue donnée (10-11)

This definition of the phoneme is comparable to the definition (d) given by Adolf Erhart and quoted above ("zvuková (akusticko-artikulační) představa, uložená v lidské paměti"), as both of the definitions have recourse to psychology. The Prague School was, at its formative period, heavily influenced by teachings of a Polish linguist Baudouin de Courtenay who perceived the phoneme as so-called "Lautvorstellung" (the mental image of a sound) (cf. Akamatsu 2001:1773). The psychological concept of the phoneme or better, the psychological view on language was quickly abandoned by the Circle. This definition is not to be discussed in the present paper, as psychology has ceased to be the aim and means of research of Functional and Structural phonology (it goes beyond the scope of the present writer's knowledge, too).

A brand new, and functionally more satisfactory, definition of the phoneme appeared in a supplement to the fourth volume of *TCLP* in 1931. This supplement was entitled *Projet de terminologie phonologique standardisée*. The volume itself constituted the proceedings from the International Phonological Conference that had taken place in Prague in 1930. "Projet" was largely drafted by Roman Jakobson for purposes of general discussion at the Conference. The published form of "Projet" is therefore a collection of the thoughts of the members of the Circle. The definition of the phoneme reads:

> Unité phonologique non susceptible d'être dissociée en unités phonologiques plus petites et plus simples. (311)

In order to fully understand the definition, it is necessary to understand to concept of the phonological unit (unité phonologique) on which the definition relies. The definition of the phonological unit goes:

> Terme d'une opposition phonologique quelconque. (*ibid.*)

The definition of the phonological unit, which is rather condensed, also relies on another concept—the concept of the phonological opposition whose definition is given as:

> Différence phonique susceptible de server, dans une langue donnée, à la différenciation des significations intelectuelles. (*ibid.*)

"Projet" introduced a new concept of the phonological opposition that was and has remained until now of the uttermost importance for Functional and Structural phonology, although it has been variously redefined, rebuilt and reclassified since then. As can be seen from the foregoing definitions, the concept of the phonological opposition necessarily precedes the concept of the phoneme. Indeed, more stress and importance is put on phonological oppositions in Functional and Structural phonology, because the phonemes are merely terms of a phonological opposition and they are not conceivable without it. This is a crucial difference between Functional and Structural phonology and any other type of phonology which does not operate with the concept of the phonological opposition.

Let us examine what the definition of the phonological opposition (and hence of the phonological unit and the phoneme) states in "Projet": the phonological opposition is a phonic difference susceptible of differentiation, in a given language, between intellectual meanings. That is to say, any phonic difference that can bring about a change of the intellectual meaning can be called a phonological opposition. The key word is "any": the definition does not specify the scope or range of the phonic difference and therefore a term of a phonological opposition (i.e. a phonological unit) can be anything that differentiates the intellectual meaning. Consider the difference between Czech words *okno* and *cihla*. The two words do not have any phonic propriety (except for the same accentual/stress pattern); they do not sound simply alike. They are therefore different and it is exactly the phonic difference that classifies the difference between the two words as a phonological opposition. We can go even further and imagine an extreme example if we compare, say, a Czech copulative conjunction *a* "and" with a potential Czech text of any length that does not contain any sound *a*. Although the phonic difference between the *a* and the *a*-less text would be enormous, the difference would be still qualifiable as a phonological opposition.

The extensive range of the concept of the phonological opposition is not, however, its weakness, because the definition was undoubtedly meant so. We can see that the

phonological opposition can cover opposition between phonemes, syllables, words etc.. The phonological units can therefore be any of the units mentioned as well as units like *mr*, *trs*, *au*, *moke* and others if the units are terms of a phonological opposition.

In light of the extensiveness of potential phonological units, the phoneme is defined as a special type of the phonological unit: a phonological unit that cannot be divided to smaller and simpler phonological units. Other units that have been mentioned (syllables, words, *mr*, *trs*, *au*, *moke*) can be divided to smaller and simpler phonological units. For instance, a polysyllabic word can be divided to several syllables which in turn can be divided to smaller units (e.g. rhymes vs. onsets) and these to yet smaller and simpler units. If this division cannot be carried any further, the phonological units so extracted are called the phonemes.

It is to be noted that the definition of the phoneme that seems to generally agreed upon in later of years of the Prague School theories is the one which operates with the phoneme as a sum of distinctive features (see e.g. Trubetzkoy 1939, Jakobson and Halle 1956, Martinet 1957). If some thing is a sum of other things, it follows logically that these things are smaller than the thing which is a sum of these things. In other words, if the phoneme is a sum of distinctive features, the distinctive feature is a smaller unit than the phoneme and it is also a simpler unit than the phoneme.

"Projet" mentions that the phoneme is the smallest phonological unit not sucessible into smaller phonological units. This may in contrary with later views on the phoneme, but it must be remembered that the notion of the distinctive feature was yet to be introduced. However, it seems that "Projet" itself shows certain traces of this later view. This may introduce terminatory inconsistency to the whole "Projet". See the definition of *Marque de corrélation* in the section *Rapports entre les unités phonologiques*:

> Caractère phonique que, oppose à l'absence de ce caractère, forme une propriété de corrélation. (*op. cit.*:313)

"Projet" contains also a definition of the archiphoneme (to be discussed later). It goes:

> Élément commun de deux ou plusieurs phonèmes corrélatifs, qu'on peut concevoir abstraction faite des propriétés de corrélation. (*op. cit.*:315)

Both of the definitions (i.e. of the mark of correlation and the archiphoneme) mention certain proprieties. And if the archiphoneme is an element common to two or more correlative phonemes, the archiphoneme has to be necessarily smaller and simpler than the correlative phonemes. Also, the phonic propriety that forms a correlation (i.e. the mark of correlation) has to be necessarily smaller than the phoneme. A correlative phoneme is conceived as some entity A, which is the archiphoneme, or an entity A + the mark of correlation. It is obvious then that the archiphoneme and the mark of correlation are smaller and simpler units. The crucial question is, however, whether they are

phonological units at the same time, i.e. whether we can conceive a phonological opposition between a zero and something.

One of the Praguian linguists who noticed the broadness of the definition of the phonological opposition (and hence also of the phonological unit) was Josef Vachek. He addressed the question in his article *Phonemes and Phonological Units* published in *TCLP 6* in 1936. Being aware that a phonological opposition as defined in "Projet" may cover the difference between English *hero* and *potato* as well as the difference between *l* and *r* in English words *low* and *row* (Vachek 1936:235), he proposed a slight redefinition of the phonological opposition. Vachek speaks about two types of the phonological opposition: simple and complex. The former type refers to "a minimum phonic difference responsible for the difference of intellectual meanings" (*op. cit.*:236). The latter type is naturally defined as "a non-minimum phonic difference responsible, in a given language, for differences of intellectual meanings" (*ibid.*). Once the two types of the phonological opposition are given, the phonological unit is redefined as being a term of a simple phonological opposition.

However, even this redefinition of the phonological opposition does not solve the problem that has already been mentioned: indivisibility of the phoneme as a phonological unit. Vachek is fully aware of this, though, when he states that "[a] phoneme like *b* […] contains two phonological units – the *p*-unit and the sonority unit [i.e. the mark of correlation]" (*op. cit.*:237). As a consequence of this, Vachek finds it necessary to reformulate the definition of the phoneme as well. The redefinition he offers runs as following:

> The phoneme is a part of a term of a complex phonological opposition which is sometimes divisible into simultaneous, but never into successive, phonological units. (*op. cit.*:239)

Although this definition was arrived at after an introduction of the complex phonological opposition, it is not the complex phonological opposition that solved the problem of the definition of the phoneme of "Projet". In fact, the notion of the complex phonological opposition is superfluous. It is the recognition of the fact that there exist smaller and simpler phonological units than the phonemes (the units that are yet to be called distinctive or relevant features) that makes Vachek's definition more functionally effective. The phoneme is after all a term of a phonological opposition (i.e. a phonological unit) that is sometimes divisible into simultaneous, but never into successive, phonological units. Whether the phonological opposition is simple or complex is of little importance as long as its terms are divisible into simultaneous, but never into successive, phonological units. A problem arises when a phonological unit is divisible neither to simultaneous nor successive phonological units. As Vachek notes, "there exist phonemes containing one phonological unit only (such as e.g. *p*, *l*, *r* in English)" (*op. cit.*:238). His wording would suggest that *p* represents two phonological units: one being the phoneme *p*, the other one being one and only one phonological unit that the phoneme *p* contains—the archiphoneme. This conception is, as has been

exhaustively proven elsewhere (see Akamatsu 1988 *passim*), self-contradictory. In case of *l* and *r* in English, the state of affairs is slightly different. Again, the phonemes, themselves being phonological units, are said to contain other phonological units. If *l* (or *r*) contains one phonological unit and nothing else, the *l* has to be identified with the phonological unit itself and there is therefore no reason to distinguish between two phonological units (cf. Martinet 1965:139). This is what Vachek fails to realize.

Vachek was not the first to introduce the notion of the phoneme as being (sometimes) divisible into simultaneous, but never into successive, phonological units. This concept probably emerged for the first time in Roman Jakobson's definition of *fonéma* that he wrote for *Ottův slovník naučný nové doby* in 1932. The entry was later translated to English and published in *Roman Jakobson Selected Writings 1* in 1962. The translation goes:

> The PHONEME […] by this term we designate a set of those concurrent sound properties which are used in a given language to distinguish words of unlike meaning. (231)

It is obvious that Vachek's and Jakobson's definitions express essentially the same concept of the phoneme, though the latter definition does not make any recurrence to the notion of the phonological opposition or unit, but this is very likely due to the nature of *Ottův slovník naučný nové doby*, because these two concepts would have had to be explained to be understood. Jakobson's definition, in its basic form, became *the* definition of the phoneme for Functional and Structural phonology.

The definition of the phoneme as a set of concurrent sound properties was recognized by N. S. Trubetzkoy, no doubt the most important member of the Prague Linguistic Circle. In his exposition *Essai d'une théorie des oppositions phonologiques* from 1936 he speaks about the phoneme as "une somme de qualités phonologique" (12, qtd. in Akamatsu 1988:23). This recognition enabled Trubetzkoy to establish and classify several different types of what he called phonological oppositions. So far only two types of the phonological opposition had been recognized: correlative opposition (cf. *Corrélation phonologique* in "Projet":313) and disjunct opposition (cf. *Disjonction* in "Projet":314). Trubetzkoyan types of what he called phonological oppositions are well and widely known. An overview and substantial criticism of these types of phonological oppositions can be found in Akamatsu 1988:19-52.[3]

To finish my exposition on the classical period of the Prague Linguistic Circle, I will shift my attention to the most important piece of work of the Circle: Nikolai Sergejevič Trubetzkoy's book *Grundzüge der Phonologie* published in 1939. The book was unfortunately published unfinished due to Trubetzkoy's premature death in 1938; it lacks therefore, *inter alia*, a final revision. Probably for that reason the excellent work is spoiled by several contradictions.

Grundzüge der Phonologie contains a couple of definitions of the phoneme. They are discussed under the section *Phonologische (distinctive) Einheit. Phonem. Variante.* Here Trubetzkoy discusses the notion of the phonological opposition. The definition he gives is in its essence the same definition as given in "Projet" (to which he gives a reference) (see Trubetzkoy 1939:30). The terms of a phonological opposition are phonological (or distinctive) units. Trubetzkoy rightly recognizes the fact that such a definition of the phonological unit covers units of various extension, but (and at this point he is again reiterating "Projet") only those phonological units that are not further divisible to other phonological units are of importance in phonology and these are called the phonemes. His first definition of the phoneme hence runs like this:

> Phonologische Einheiten, die sich vom Standpunkt de betreffenden Sprache nicht in noch kürzere aufeineanderfolgende phonologische Einheinten zerlegen lassen, nennen wir P h o n e m e. Somit ist das Phonem die kleinste phonologische Einheit der gegebenen Sprache. (34)

In the same section, however, Trubetzkoy gives another definition of the phoneme. This definition is presented emphatically and it seems therefore reasonable that this is the definition Trubetzkoy intends to operate with in his work. It reads:

> Man darf sagen, daß d a s P h o n e m d i e G e s a m t h e i t d e r p h o n o l o g i s c h r e l e v a n t e n E i g e n s c h a f t e n e i n e s L a u t g e b i l d e s i s t. (35)

This definition is essentially the definition of the phoneme by Jakobson as presented in *Ottův slovník naučný nové doby*. Indeed, this is the place to which Trubetzkoy immediately refers. It is, however, questionable how this definition is compatible with the first definition that is comparable with the definition given in "Projet". If both of the definitions were meant by Trubetzkoy to be valid at the same time, it follows necessarily that the relevant properties of the sound (Lautgebilde) are not phonological units, because the phoneme is "die kleinste phonologische Einheit". Trubetzkoy's restriction about divisibility of the phoneme into smaller successive units suggests that the phoneme is analyzable into smaller entities, which are in turn the relevant properties of the sound (Lautgebilde), but these properties are not phonological units, i.e. they are not terms of

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[3] To put it briefly, the opposition that Trubetzkoy calls phonological can only be functionally valid if they are understood not as phonological oppositions but as phonic oppositions (or difference). It will suffice to quote Trubetzkoy's own words:

> Distinktive Funktion kann daher einer einer Lauteigenschaft nur insofern zukommen, als sie einer anderen Lauteigenschaft gegenübergestellt wird – d. h. insofern sie das Glied einer lautlichen Opposition (eines Schallgegenstzes) ist. (Trubetzkoy 1939:30)

The so-called *privative opposition* (for instance) fails to follow this principle.

any phonological opposition. This goes back to Trubetzkoy's exposure of what he calls phonological oppositions. If the relevant properties of a sound (Lautgebilde) are not recognized as phonological units, there cannot be, by definition, any question of phonological opposition between two phonic properties (as in case of the equipollent opposition).

At this point we may speak about the end of the classical period of the Prague School. Trubetzkoy was not able to finish and reformulate the theory of the phoneme as a sum of phonologically relevant features. Although he was well aware of the fact that the phoneme is best to be conceived as a sum of phonologically relevant features (cf. Trubetzkoy's criticism of other definitions of the phoneme in Trubetzkoy 1939:37-41), his own account on the phonologically relevant features remained unformulated (cf. Martinet 1965:127).

The linguist who probably for the first time presented and put forth an account on the nature of the phonologically relevant features of which the phoneme is a sum was the very originator of the definition itself: Roman Jakobson, namely in a lecture on Czech consonants presented at the 3rd International Congress of Phonetic Sciences in 1938. A résumé of this lecture appeared in the fourth volume of *Slovo a slovesnost* (p. 192) and the French version was published in *Proceedings of the 3rd International Congress of Phonetic Sciences* in 1939 (pp. 34-41), later reprinted in Jakobson 1962 (pp. 272-279). It is well known that after his emigration to the United States of America, Jakobson worked up his theory of distinctive features in collaboration with Morris Halle and Gunnar Fant. At the date of 1938, however, the term "distinctive feature" was yet to be introduced. The term by which Jakobson designated the phonologically relevant features of the phoneme were called *qualités différentialles* in the French version of Jakobson's account on Czech consonants. The "qualités differentialles" were nevertheless already at this time conceived as binary and universal characteristics common in different extents to every language. It must be stressed out that Trubetzkoy, as far as his and Jakobson's private discussion in February 1938 went, never agreed with Jakobson on this nature of the relevant/distinctive features (whatever they are called). It was probably their privative (i.e. binary) and universal (*a priori*) character that caused and still causes most problems and objections against this theory, though it has since acquired a wide popularity. The theory of distinctive features will not be further discussed in this paper, because as Akamatsu 2001 notes:

> Jakobsonian distinctive feature have come to be utilized in a non-functional type of phonology known under the name of 'generative phonology' which has abandoned the concept and use of the phoneme, and therefore they represent a departure from functionalism that characterized the classical period of the Prague school. (1774)

THE FUNCTIONALIST SCHOOL

The linguist that developed the concept of the relevant feature the way Trubetzkoy could have done was a French linguist André Martinet. It has already been mentioned that he found his early linguistic outlook in sympathy with the theories of the Prague School. He was of course aware of the definition of the phoneme as a sum of phonologically relevant features, and this was and remained the definition of the phoneme he adopted, developed and used in his own theory. His pupils and adherents to his views naturally adopted this definition as well. Having worked out a clear theory of the relevant feature, Martinet refined the concept of the phoneme. An overview of the development of Martinet's view on the relevant feature can be found in Akamatsu 1988:79-82.

The form of the definition of the phoneme that Martinet uses can be quoted, for instance, from *Description phonologique du parler franco-provençal d'Hauteville (Savoie)* which appeared in *Revue de linguistique romane 15* (pp. 1-86) in 1945. The definition goes:

> Un *phoneme* peut être considéré comme un ensemble de traits pertinents qui réalisent simultanément. (Martinet 1945, qtd. in Akamatsu 1988:103)

Martinet 1945 was later reworked and republished in the form of Martinet 1956 which gives the same definition (see Akamatsu 1992:32). In 1960 Martinet wrote *Eléments de linguistique générale* which is considered the best introduction to the Functionalist linguistics (it has been reprinted several times since). The phoneme is here defined as "la somme des traits pertinents" (3.18). This definition is very similar to the definition of Trubetzkoy's (1939:35), though the attribute "phonologically" (German "phonologisch") is not included, but this is not necessary, since the phonological status of the relevant feature is obvious (it is implied from the definition and the nature of the relevant feature that will be yet discussed). What is really lacking (and this may be a serious flaw) is, however, any mention about the simultaneous realization of the relevant features within a constituting phoneme. The relevant features are, within a phoneme, realized simultaneously, which means that there are no syntagmatic (or ordering) relations within them. It is immaterial which, in a description of the phoneme in terms of relevant features, of the relevant features will be mentioned first, because there is no order in among them. From this point of view, the definition of Martinet 1945 (resp. Martinet 1956) is to be preferred.

Although the relevant feature has been mentioned several times, so far no definition has been given. Probably the first formal functionalist definition of the relevant feature was given in Martinet 1945. It goes:

> On nomme *trait pertinent* tout trait phonique susceptible de différencier à lui seul le sens intellectuel d'un mot ou d'un énoncé[.] (qtd. in Akamatsu 1988:80)

In subsequent writings of his Martinet had opportunity to reiterate and reformulate this definition but it had not been until 1957 when he presented an extensive treatment of the concept of the relevant feature whose principles have remained with a few slight modifications valid and acknowledged until the present day. The treatment in question was an article called *Substance phonique et traits disctinctifs* which appeared in *Bulletin de la Societé Linguistique de Paris 53* (pp. 72-85). The article was later reprinted in Martinet 1965 (pp. 124-140). The relevant feature (un trait pertinent) is here defined as:

> […] un *ensemble* de caractéristiques phoniques distinctives qui ne se trouvent dissociées nulle part dans le système […] (Martinet 1965:138-139)

This definition is what can be called the *internal structure of the relevant feature* (see Akamatsu 1988:99). It is to be realized that

> (1) the relevant feature [as conceived by the Functionalists] is not a single phonic feature but a complex of multiple distinctive phonic features; and
> (2) the relevant feature is such that its multiple distinctive phonic features are mutually non-dissociable. (Akamatsu 1988:100)

It is obvious that such a conception of the relevant feature is fundamentally different from the conception of the distinctive feature as conceived by Jakobson and others. What is more, these two principles, which derive from the principle of the internal structure of the relevant feature, are not the only ones that make the Functionalist notion of the relevant feature unique and different to the notion of the Jakobsonian and/or Chomskyan distinctive feature. The relevant feature is underpinned by yet other principles: *the functional principle of the relevant feature*, *the principle of identification of the relevant feature* and *the functional equivalence of the relevant feature*.

The first principle, the functional principle of the relevant feature, was best formulated in Akamatsu 1988 from which it will be quoted.

> No relevant feature is conceivable without there being simultaneously conceivable at least another relevant feature to which it is opposed, so that any relevant feature is by definition opposed to one or more other relevant features in a given phonological system. (90)

The core of this principle lies in Functionalists' recognition of the relevant feature as a phonological unit. A phonological unit, as mentioned above, is conceivable only by its being opposed to another phonological unit (or units) forming thus a phonological opposition (a principle that was well familiar to Trubetzkoy). To give an example, /b/ in Czech can be identified as possessing the relevant feature 'voiced' only if the relevant feature is opposed to another relevant feature, in case of Czech to 'voiceless', which is one of the relevant features that characterize the phoneme /p/. The relevant feature

'voiceless' is as valid as 'voiced' is and there is therefore no question of identifying /p/ as 'labial' and /b/ as 'labial voiced', because the feature 'voiceless' is as relevant for /p/ as 'voiced' is relevant for /b/.

The principle of identification of the relevant features (and therefore of phonemes as sums of the relevant features) derives from the concept of the phonological opposition and the distinctive function of the phoneme, resp. of the relevant feature. The relevant feature, although usually called "relevant", is after all a *distinctive* feature, which means that it is capable of distinguishing between intellectual meanings. The formal (and the only) procedure that is used for elicitation of the relevant features is the so-called *commutation test* (it is "la seule procedure théoriquement recommandable", Martinet 1968:6). The principle of the commutation test was not, however, described by a Functional and Structural linguist but by a Danish linguist Louis Hjelmslev. In his *Ombring sprogteoriens grundlæggelse* from 1943 (translated to English as *Prolegomena to a Theory of Language* by Francis J. Whitfield in 1963) he speaks about a special function of commutation which is set between invariants (phonemes can be thought as phonological invariants). Hjelmslev writes:

> The specific structure of an individual language, the traits that characterize a given language in contrast to others, that differentiate it from others, that make it similar to others, and that determine the typological place of each language, are established when we specify what relationally defined categories the language has, ans what number of invariants enter into each of them. The number of invariants within each category is established by the commutation test. (Hjelmslev 1963:72)

Although so much stress is put on this procedure, curiously enough the procedure itself has not been described in detail until recently. It is briefly described in Martinet 1965:63-64, 66 (first published in 1947). A reduced form of the commutation test is carried out by Martinet in his phonological analysis of a Franco-Provençal *patois* spoken at Hauteville (Savoy) in France published as Martinet 1956 (on the reduction and for a critical discussion on Martinet's analysis see Akamatsu 1995). Although various Functionalists have apparently operated with principles of the commutation test in their analyses (cf. e.g. Tcheu 1967 of Korean consonants or Mulder and Hurren 1968 of English vowels), the procedure has not been adequately described until Akamatsu 1988 (see pp. 103-108). The same author discusses the commutation test in great detail in Akamatsu 1992:60-80 and in Akamatsu 1995. The basic principle of the commutation may be briefly put this way:

> Commutation is said to occur if the replacement of one phonic element by another or other phonic elements at a given point in a given set of sequences of phonic elements (they may be of segmental or suprasegmental nature) which are identical but for the replaceable phonic elements results in a change in the identities of linguistic forms. (Akamatsu 1992:60)

The third fundamental principle of the relevant feature, the functional equivalence of the relevant feature, also derives from the concept of the phonological opposition and from the functional principle of the relevant feature. Since a relevant feature is conceivable and identifiable only by its being opposed to another or other relevant features and since it is enhanced with the distinctive function (i.e. ability to distinguish between intellectual meanings), it follows that a relevant feature that is opposed to another relevant feature is naturally what the other feature is not (this of course holds true for more than two mutually opposed relevant features). To give an example, the relevant feature 'voiced', which is, for instance, distinctive for /b/, is opposed to the relevant feature 'voiceless' by the fact that it covers different, quite opposite, reality than the relevant feature 'voiced'. The relevant feature 'voiced' is simply 'non-voiceless' and *vice versa*, the relevant feature 'voiceless' is simple 'non-voiced'. This applies to multi-oppositional relevant features as well ('voiced' vs. 'voiceless' are bi-oppositional). We can postulate these relevant features for Czech consonants: 'labial' (for /p/), 'apical' (for /t/), 'palatal' (for /t'/, 'hiss' (for /c/), 'hush' (for /č/) and 'velar' (for /k/). Any of these features is mutually opposed to another of them, thus covering a certain linguistic reality that the others do not. Each and every one of these relevant features is a complement to the rest. Therefore the relevant feature 'labial' (for instance) is functionally equivalent to 'non-apical non-palatal non-hiss non-hush non-velar'. The account on the functional equivalence was derived from Akamatsu 1988:108-110; the French examples were replaced by the Czech ones for better clarity but the essence has remained the same.

Although the foregoing formative principles of the relevant feature have been cited from Akamatsu 1988, they had been firmly embedded in other Functionalists' works. Tsutomu Akamatsu only formulated them in a very clear way. It has already been mentioned that he is most likely the most prominent Functionalist phonologist of today. His work *The Theory of Neutralization and the Archiphoneme in Functional Phonology* (published in 1988) is a comprehensive survey to various notions and concepts of Functional and Structural phonology. The book *Essentials of Functional Phonology* from 1992 is then the best introduction to Functional phonology. It is here where indeed the essentials of Functional phonology are explained with minute clarity and the principles of (*inter alia*) the relevant feature and commutation test receive detailed treatments as never before. However, the phoneme itself (although its nature is explained) is rather loosely defined. Perhaps it is because, as Akamatsu notes:

> [I]n functional phonology, the principal role is played by phonological oppositions and not by phonemes; in other words, the concept of phonological opposition logically precedes that of the phoneme. (Akamatsu 1992:31)

As regards the definition of the phoneme itself, Akamatsu cites only Trubetzkoy's definition from Trubetzkoy 1939:35 and Martinet's definitions from Martinet 1960: 3.18 and Martinet 1956: 3.13. Since these as a whole form *the* definition of the phoneme,

Akamatsu apparently find no reason or need to redefine the phoneme, although he presents a number of clarifications of the definition throughout his work.

AXIOMATIC FUNCTIONALISM

The fact that even at a very recent date the definition of the phoneme remained *au fond* unchanged since Trubetzkoy 1939, or actually from Jakobson's definition from 1932, it does not mean that there have not been any improvements at all. It is true that what has been changed and developed is the concept of the relevant feature but the definition of the phoneme itself has been changed as well.

There exists a brand of functionalist linguists called Axiomatic Functionalists. The most prominent person of this group is undoubtedly J. W. F. Mulder; his work *Sets and Relations in Phonology* (1968) is the best introduction to Axiomatic Functionalism. As the attribute "axiomatic" suggests, the approach of these linguists to the speech is based on mathematical and logical principles, which is, however, deemed to be much less realistic than the approach of Martinet and his adherents (cf. Akamatsu 2001:1786; on realism in linguistics see Martinet 1961:1-38). Be it as it may, the phoneme is defined by Mulder as:

> […] a simultaneous bundle of distinctive features in phonology which does not extend over more than one position in the chain. (Mulder 1968:26)

If we realize that the term "distinctive feature" is nothing but "relevant feature" (these terms are sometimes used synonymously in functionalist phonology but they are never to be confused with non-functionalist conceptions thereof), the definition is based on and derived from Martinet's (1956) definition (whom Mulder credits). The core and fruitfulness (but also the flaw) of this extended definition lies in the notion of the position in the chain. The position is defined as:

> […] a place in which a form can stand and is substitutable for similar forms. We can call it a paradigmatic point on the syntagmatic axis. (*ibid.*)

Mulder's assumption is such that in a language there are a number of positions, i.e. intersections of paradigmatic axis on the syntagmatic axis (the speech chain). At every point of the chain the speaker can choose from a set of units that can occur at that point. The relation between the units that can occur at a given point in the chain is paradigmatic; the relation between particular units occurring in the chain is syntagmatic. It follows logically that there must be at least two positions so that any relation between them could be established. This relation is called, in functionalist phonology, *contrast*. Likewise, there must be at least two units that can appear at a given point of the chain so that any relation between could be established. The relation is called *opposition* and the

particular units are said to be commutable with one another. The commutability is of course the principle that underlies the commutation test.

The positions are, like relevant/distinctive features, phonemes and archiphonemes, language-specific, that is to say, their establishment is carried out exclusively for each and every language. Mulder and Hurren establish, for instance, eight positions for English: pre-explosive, first explosive, second explosive, nuclear, first implosive, second implosive, third implosive, and post implosive (see Mulder and Hurren 1968:47). Empowered with the notion of the position, Mulder and Hurren are able to make a sharp distinction between vowels, semivowels and consonant from a functional point of view: vowels are now those phonemes that can appear in the nuclear position only, the semivowels are those phonemes that can appear in both nuclear and non-nuclear position, and finally, consonants are those phonemes that can appear in non-nuclear positions only. This distinction is very similar to e.g. Hockett's (he is himself a non-functionalist, though) division of the phonemes (Hockett 1955:74-76 and Hockett 1958:93-95). The whole theory of position is then similar to the so-called slots in Autosegmental phonology (a non-functionalist and non-linear type of phonology, see Durand 1990: 7.3).

One of the consequences of the notion of the position in phonology is that now vowels and consonants cannot be said to be directly opposable (sc. commutable), because they occur in different positions and are not members of the same commutation classes (Mulder's term, see Mulder 1968:128). This is one of the points where Mulder's theory differs from that of Martinet. Martinet operates with direct opposability of vowels and consonants, see Martinet 1960: 3.21 and Martinet 1949:19-20, where French words *chaos* /kao/ and *cap* /kap/, in which a vowel and a consonant stand in the same context, are mentioned. Mulder's analysis would differ in maintaining that /o/ in *chaos* and /p/ in *cap* occur in different positions and are not therefore directly opposed to one another.

ARCHIPHONEME

A concept that has not been discussed yet, though mentioned several times, but which is of the uttermost importance for Functional and Structural phonology, is the concept of the archiphoneme.

Functional and Structural phonology (though particular scholars are not always in agreement) recognizes a phenomenon that is called *neutralization*. The concepts of neutralization and archiphoneme are very important in Functional and Structural phonology (particularly in Functionalist phonology), as this type of phonology is predominantly concerned with phonological oppositions. Phonological oppositions, once established, are recognized as either operational or inoperational in a given language. If the latter is the case, the process of inoperability of a phonological opposition is called *neutralization*. There are therefore contexts in which a phonological opposition is operational; these contexts are called contexts of relevance; and contexts where the phonological opposition is inoperational or canceled; these contexts are then called contexts of neutralization. The phonological/distinctive units that occur in the former positions are the phonemes (sums of relevant features) and the phonological units that occur in the latter positions are the archiphonemes (sums of relevant features common to two or more phonemes of a neutralizable opposition).

The foregoing descriptions of the archiphoneme and neutralization have been deliberately intended to be brief, because it is not a purpose of the present paper to examine these notions. In fact, a very extensive examination of these notions was done in Akamatsu 1988.

Non-functional phonological theories do not, as a rule, operate with the notions of neutralization and archiphoneme. It is therefore not only the view of the phoneme as a sum of relevant features and the concept of the relevant feature that make Functional and Structural phonology unique. A list of distinctive units of an analyzed language should include phonemes as well as archiphonemes (see Martinet 1949:7), though this would necessarily make the list of distinctive units larger than if the analysis would have been carried out by a linguist not operating with archiphonemes. It may be argued that the introduction of the archiphoneme to a phonological description will make the description unnecessarily complicated. The complication is, however, only illusive, because once a detailed description of the phonological level of the speech is worked out, the analysis of the morphological level will be much easier. Cf. in this connection Mulder 1968:

> Because Martinet recognizes […] two separate levels of description, he can—after having been meticulous about form in phonology—afford, in grammar, to deal with form in a very casual manner. (45)

On the other hand, it must be stress out that although the Functional and Structural linguists operate with phoneme as sums of relevant features and archiphonemes as sums of relevant features common to phonemes of a neutralizable opposition and that in general the theory of Functional and Structural phonology is in many respect different to other phonological theories, the phonic reality remains the same no matter how it is examined and described. Also, whichever analysis is conducted and whatever viewpoint is taken, the practical results remain relatively the same. In this connection cf. Martinet 1949:

> I just want to make clear that, though the London School and the so-called Prague School approach the problem from different angles, they both come to results which are, for all practical purposes, the same. When my friend J. P. Vinay, who had the good fortune to be Daniel Jones's student for many years, and I try to determine the number and the nature of the phonemes of a given language, the results arrived at are practically the same or, at any rate, they do not differ more than they would if the analysis had been practised by two avowed phonologists. There is nothing surprising about it, as we both have in mind to set apart, and

give prominence to, those phonetic differences which are sufficient to distinguish one word or one grammatical form from another. (1)

CONCLUSION

Although this paper is entitled *Phoneme in Functional and Structural Phonology*, not all of the attention has been directed to the phoneme in this type of phonology. I have tried to show that there are several definitions of the phoneme offered by different schools and/or scholars. My contention is that these definitions are all valid within the frame of the theories in which they were postulated but they should not be meant to be universally valid. Nearly every phonological school offers its own way to describe various speech phenomena and the basic formative unit they choose to operate with at the level of phonology is usually called the phoneme, but it should not be concluded that the concept that is called the phoneme is always the same thing. It is hardly so. In fact, some of the various concepts of the phoneme are not compatible with others.

Some of the concepts of the phoneme may yet be found complatible or may at least supplement each other. Such a situation is often found within one type of phonology, represented by one type of phonological (or linguistic) school.

One of such schools is so-called Functional and Structural linguistic school. The main part of this work has been dedicated to an examination of the development of the notion of the phoneme within this school, particularly within Functional and Structural phonology. This approach to the speech is connected with the names of Roman Jakobson, Nikolai Sergejevič Trubetzkoy, André Martinet, Tsutomu Akamatsu and others.

The theory of Functional and Structural phonology is, however, not coherent. There exist many thoughts and different opinions. The diversion goes so far that is better to distinguish two separate, though related, schools of Functional and Structural phonology. The first one is connected with the Prague Linguistic Circle. The second one is the so-called Functionalism which may be said to begin when the Prague School was forced to end with the beginning of World War II. My work follows the distinction and therefore the first part of this survey is dedicated to the development of the phoneme from the beginning of the Prague Linguistic Circle through its heyday until its culmination in 1939 when Trubetzkoy's *Grundzüge der Phonologie* was published. Since I regard the Functionalism as the true continuation of the Praguian theories on phonology, the second part is devoted to the Functionalism. The person who developed the majority of the concepts of this school is a now late French linguist André Martinet. He has had a lot of adherents throughout the world, one of them being Tsutomu Akamatsu whose work has been largely reflected in this treatise.

At the beginning of Functional and Structural phonology, the phoneme was conceived as a psycho-linguistic entity but this view was soon abandoned. A fundamental notion of the phonological opposition was introduced. It is the formative principle of Functional and Structural phonology. The phoneme was now conceived as a term of such a phonological opposition. Later this definition was found insufficient and a new notion of the relevant feature was introduced. The phoneme, though still being a term of a phonological opposition, was conceived as a sum of relevant features. The theory of the relevant feature itself remained, however, unformulated due to the beginning of World War II and death of Trubetzkoy. The theory of distinctive features that was developed by Jakobson became progressively non-functional in its nature. It was André Martinet who formulated the functional theory of the relevant features and therefore the new definition of the phoneme. This definition remained basically the same to the present day. One noteworthy change can be noted in works of Axiomatic Functionalists on which a few words have been spent. A couple of paragraphs have also been spent on the notions of neutralization and archiphoneme that are exclusive to Functional and Structural phonology.

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