The study of phonematic systems and of their development is an urgent task of linguistics which is earnestly recommended to the Second International Congress of Phonetic Sciences.

II. Mr H. J. ULDALL (Copenhagen): *The phonematics of Danish*.[1]

§ 1. This paper must be regarded as a preliminary report on the work of the Phonematic Committee of the Copenhagen Linguistic Circle. The work has not been completed, but we should like nevertheless to put a few of our results before the Congress as an illustration of phonematic method.

§ 2. Danish contains the following phonematic units:

central . . . . {a ā ɛ ε̄ e ē i ī ɔ ɔ̄ o ō u ū œ œ̄ ø ø̄ y ȳ

       phonemes {

marginal { . . . . . {b d f g j k l m n p r s t v

      { . . . . . {≡ T$_1$ T$_2$ T$_3$ T$_4$

      prosodies {

superimposed . . . . {A$_1$ A$_2$ A$_3$

In this list those who know Danish phonetics will miss ð, ɣ, ə, ŋ. ð is found to be a realization of *d*, which is used in final position in the syllable after a vowel (e.g. *gud* guð "god") and optionally after the consonant **r** (e.g. *byrd'* byr'd or byr'ð "descent"); *g* is realized as ɣ under the same conditions and after the consonants *l* and *r* (e.g. *vāg'* va'ɣ "vague", *valg'* val'ɣ "choice"); ə is a realization of ε in unaccented syllables after the accent (e.g. *glīdε* gliːðə "glide"), and of *e* in unaccented syllables before the accent (e.g. *be* ˈtAl'ε bə ˈta'lə "pay"). Here, by the way, is an example of overlapping but not of implication: both of the phonemes ε and *e* are realized as ə under certain conditions, but these conditions are mutually exclusive so that, although the two phonemes have a type of realization in common, there is no replacement of one phoneme by the other.

ŋ, which does not occur initially, cannot be a consonant according to the rule that a consonant must occur both as single initial and as single final element in a syllable. ŋ is a realization of the group *ng*, the combination ŋg being a realization of *nk*. According to the same rule h is not a phoneme but a prosody, since it occurs as a significant unit only in initial position in the syllable.

§ 3. Prosodies are defined as consolidating either one syllable, accents, or a string of syllables, intonations. Of the second kind we have four in Danish: glottal stop (T$_1$), not glottal stop (T$_2$), h (T$_3$) and not-h (T$_4$); of the first, three: accents 1, 2, and 3 (A$_1$, A$_2$, A$_3$), realized as strong stress, half-stress, and weak stress.

Prosodies are further divided into grammateme prosodies, i.e. prosodies that consolidate a single grammatical element, e.g. h and not-h in Danish, and syntagm prosodies, such as glottal stop and not glottal stop and the three accents: there are no two single grammatemes in Danish distinguished by accent alone. The accents are

[1] See footnote on p. 49.

superimposed, i.e. they do not interrupt the speech-chain; the four intonations are linear, marginal.

§ 4. The marginal intonations glottal stop and not glottal stop occur only in final position in the syllable. The difference between the presence or the absence of the glottal plosive sound in initial position is phonematically irrelevant.

The place of the glottal stop depends on the structure of the syllable; in syllables containing a long vowel the glottal stop comes immediately after the vowel, in syllables containing a short vowel the glottal stop may fall on the vowel or on a following voiced continuant, including ð and ɣ. The place of the glottal stop is not significant in the norm but is fixed by usage, so that for instance the word *bløð'* "soft" is pronounced in one usage blø'ð, in another bløð'. Even such a word as *sεl'* "self" may be pronounced sε'l in spite of the existence of another word sε'l, which means "seal".

When the realization of the glottal stop falls on a vowel, an implication long vowel in short vowel comes into force, i.e. all vowels, whether phonematically long or short, are realized short, so that the phonematic interpretation of the vowel as long or short is only possible if the syllable in question can be brought into a position where the conditions of the implication are not fulfilled. Thus the syllable ɔ' "river" is never used without the glottal stop, so that it is impossible to determine whether the vowel is phonematically ɔ̄ or ɔ. In be'n "bone" the vowel is phonematically ē, as shown by the pronunciation of the syllable in the compound ˈbeːn ˌknap, while bly' "lead" has *y* as shown by ˈbly ˌknap "lead button".

It follows from this that what is phonetically a difference in the place of the glottal stop is in some cases phonematically irrelevant, while in other cases it must be interpreted as a difference between long vowel and short vowel.

There is a conditional and optional implication of T$_1$ in T$_2$ (glottal stop in not glottal stop), which comes into force concurrently with the alternation A$_1$: A$_3$.

§ 5. The marginal intonations *h* and not-*h* occur only initially as has been mentioned. The difference between the presence and the absence of the sound h in final position is phonematically irrelevant: any syllable before a pause may end in aspiration, and the leaving out of this aspiration does not cause any change of meaning.

The intonations *h* and not-*h* are further characterized by not entering into any relation, whether implication or alternation, either with each other or with any other phonematic unit in the language.

§ 6. When a speech-chain containing a syllable with A$_1$ (full stress) is the second member of a compound whose first member is also a speech-chain containing a syllable with A$_1$, composition is marked by A$_2$ (half-stress) in the second member of the compound. This accent does not necessarily fall on the syllable that has A$_1$ in the free form: from ˈεfDεr "after" and ˈmeda "noon, dinner" is formed a compound meaning "afternoon" which may be pronounced ˈεfdərˌmeda or ˈεfdərmeˌda.

There is thus an alternation A$_1$: A$_2$ corresponding to the gram-

matical alternation not second member of a compound : second member of a compound, cf. ˈɛfDɛr ˈmeda " after dinner " : ˈɛfDɛrˌmeda " afternoon ".

There is further an alternation $A_1 : A_3$ not first member of a distance compound : first member of a distance compound, e.g. ˈgɔˈudˈ " walk out " : gɔ ˈudˈ " go out ".

In syllables containing a long vowel or, in the usages where it occurs, a glottal stop, A_3 is realized in the same way as A_2, i.e. as half-stress. In other words, A_3 is implied in A_2 under those conditions.

§ 7. The possibility of implication, i.e. the replacing of one phoneme by another, depends on the grouping relations in such a way that implication is only possible between two phonemes that do not occur in juxtaposition. A study of the permissible consonant clusters will therefore yield a complete list of the possible implications between consonants. It should be added that in the study of grouping relations only single grammatemes are taken into account, so that what Bloomfield calls post-finals are not included. Furthermore, foreign loan-words and imperatives have been left out, because in these forms groups occur which are not otherwise permissible in the language (e.g. in *slobr, klatr, vekl*). The conclusion is that the imperative is normally formed by subtraction.

I cannot, in the time allotted to me, go through the whole list of implications formed in Danish, but I should like to present a few typical examples.

The two series of plosives do not occur in juxtaposition, and implication is therefore possible between p and b, t and d, k and g. These implications do exist and come into force under the following conditions :

(1) Mutual implications are found between p and b in final position, between t and d in final position after a consonant, and between k and g in final position after a consonant other than r and l. That is to say, that any final p or b may be realized **p** or **b**; the two phonemes are completely merged, so that it is only possible to tell whether a given sound is a realization of one or the other, if the grammateme in which it occurs can be brought into a position where the implication is not in force. Thus the final consonant of **lø'b** or **lø'p** can be determined as a realization of the phoneme b by the form ˈfɔːrə ˌlø'bi, where p would have been realized **p**.

The reason for the difference in scope of these mutual implications is that the two phonemes p and b have between them only two types of realization, viz. **p** and **b**, each with minor conditional variants, while the pairs t and d, k and g have each three : **t, d, ð** and **k, g, ɤ** respectively, of which **ð** occurs only after vowels, while **ɤ** occurs also after the consonants r and l as realizations of d and g, so that in these positions we have overlapping but not implication.

(2) There is a conditional and obligatory mutual implication p/b before an $ɛ$ in an unaccented syllable, and before consonants, except r and l, followed by other vowels than unaccented $ɛ$. It is only possible to disentangle the two phonemes if the grammateme con-

taining the sound in question can be brought under conditions where the implication is not in force; thus in $āBɛ$[1] " monkey " it cannot be determined whether we have p or b, but the **b** of **grubə** " group " is a realization of p as shown by the verb **gruˈpeˈrə**.

(3) t and d enter into a mutual implication in the neuter definite article $ɛD$ ($D = t/d$) in such a way that each usage chooses t, realized as **t** or **d**, or d, realized as **ð**.

(4) After s there is only one set of realization types, viz. **b, d, g**, and in view of the implications already established, it is therefore not possible to determine whether in this position we have p or b, t or d, k or g. There is, however, one indication that these sounds may represent the tenues : according to the rule that complex consonant clusters are always compounds of simple clusters, the initial group **sgv-** must contain the phoneme k and not g, since kv- does and gv- does not occur in native words. From this it might be concluded, that after s we have always k—and also p and t.

12. Dr J. von Laziczius (Budapest) : *A new category in phonology*.

Up to the present, no practicable definition of phonemes and variants has ever been suggested. This is due, I think, to the circumstance that the statement of the facts which should have provided us with the ingredients of our definition was not correct. More careful consideration shows convincingly that the two big categories of phonology, viz. phonemes and variants, will not account for every phenomenon in question. We need also a third one which would fit in naturally and organically between the above two categories.

In studying the so-called stylistic variants, I have noticed that they are fundamentally different from combinatory, facultative, or any other variants. They are definitely more than variants, but also definitely less than phonemes.

When we pronounce the Hungarian word ɛmber *man* with a certain affective force, the vowel of the first syllable often lengthens into ɛː. If we compare these two words ɛmber ~ɛːmber, we notice at once that there is a difference of quantity between the two first syllables, just as in the case of tør *he breaks* ~tøːr *dagger*. But from the semantic point of view, the function of quantity is not the same in the two examples. In the latter case the two opposite meanings *breaks* and *dagger* have nothing to do with each other. As the linguistic exponent of this difference of meaning is here the quantity, this quantity has, as we say, a phonological value; øː (as opposed to ø) is therefore a phoneme. But in the case of ɛmber and ɛːmber, there is no semantic difference of the kind; quantity has here quite a different value, and ɛː (as opposed to ɛ) is by no means a phoneme. But if it is not a phoneme, is it perhaps a variant? Any phonologist would give a positive answer, for not only the old psycho-phoneticians, but even the modern school of Prof. Trubetzkoy declares: " tertium non datur ", anything that is not a phoneme must be a variant. In our particular case, it would be, of course, a stylistic variant.

[1] $B = p/b$.