

second component, and 3° as the only component of a central unit (1).

I should have liked to discuss two things more : the possibility of a functional definition of falling and rising diphthongs, and the further analysis of vowels into central cenemes, but it would take too long, particularly the falling and rising diphthongs, which would necessitate a long excursion into the theory of accentual units.

Let me say in conclusion that our attempt, in these two papers, to indicate a deductive and unambiguous method has been inspired by no theological belief that our particular approach is the only possible or even the only desirable one. On the contrary : the functional study of the cenematic system must be supplemented by a physical, a physiological, and a psychological study of the sound pattern. What we would urge upon your consideration is that all efforts should be coördinated and should be based upon and subjected to the mother-science of Linguistics.

41. Mr. PAUL ARISTE (Tartu) : *A Quantitative Language.*

One part of the Fenno-Ugric languages is worthy of attention for the reason that it possesses its own well-developed quantitative system. By this is meant the Balto-Finn languages (Finnish, Votic, Estonian and Livonian) and the Lapp dialects. The last especially, and, of the Balto-Finn group, the Estonian language are of such a character that they can be called typical quantitative languages, that is, languages where the quantity of the sounds in relation to other phonetic characteristic occupies a central position. In the following short survey it is intended to consider the Estonian language, and in the summary to present the quantitative relations of this language and to show how a great part of the pronunciation system of the language depends on quantity.

In most languages known to phonetic literature the quantitative relations are very simple. Generally a short consonant follows a long vowel, and a short vowel is followed by a long consonant or a group of consonants. At the same time the length of the sounds depends on the stress. In the Estonian language the possibilities of combining short and long sounds are extens-

(1) I am purposely leaving out in this paper the occurrence of vowels in marginal units, such as Danish *kuŕv* = 'ghuru' „basket". For a treatment of this function see L. HJELMSLEV and H. J. ULDALL : *An Outline of Glossematics, Humanistisk Samfunds Skrifter I* (Aarhus-Copenhagen-London, 1939).

ive. The fact that this language possesses more than two degrees of length makes the abundance of quantitative groups still greater. Glottologically there exist three lengths — short, long and extra long, for example : „sada" hundred, „saada" send, „saada" to get ; „kabi" (*b* is a short voiceless *p*) hoof, „kapi" gen. sing. wardrobe, „kappi" part. sing. wardrobe, or „kafi" small beer, „kallis" nom. sing. dear, „kalli" gen. sing. dear. The length of a short vowel is about 10, of a long about 25 and of a extra long about 35 in hundredth of seconds. The three degrees of length of the consonants are more or less of the same extent. The smallest error in one of the abovementioned lengths may lead to a misunderstanding, or may even make what has been said unintelligible. So, even phonologically (according to the ideas of the Troubetzkoy school) there are three important vowel and consonant lengths in the Estonian language. Besides these three lengths, there are still other degrees in Estonian, which glottologically are not of the same importance as the aforementioned, but which are postulated by correct pronunciation and from which depend important phonetic relations. First of all there should be mentioned the half-length sound, *inter alia* the half long vowel of the second syllable : „sadà" hundred, and the one-and-a-half length vowel which is between the long and the extra long vowel, „saata" to send. The length of these vowels in hundredths of seconds is about 15 and 30. So, really, there are in Estonian at least 5 important degrees of length which cannot be ignored in any way. In addition there are 4 more combinatory degrees of length of lesser importance, so that in this survey they can be passed over in silence.

In the first syllable, on which the principal stress falls, all the different degrees of length of both vowel and consonants may appear with one another in almost every possible combination, for instance, a short vowel and a short consonant („kala", fish) ; a long vowel and a short consonant („tooli", gen. sing. chair) ; a one-and-a-half-length vowel and a long consonant („kooki", part. sing. cake : the word is pronounced „kook + ki") ; a long vowel and a short consonant („vaapsik", hornet) ; an extra long vowel and a short consonant union („koolgi", even the school) ; a one-and-a-half-length vowel and a long consonant union („viitsima", to care to), etc. From the last examples it is evident that not only the single sounds have several degrees of length, but that the sounds unions have them too. Every consonant union may be longer or shorter quantitatively and the diphthongs too have two degrees of quantity, for example : „laulma" to sing, with a diphthong where *u* is long, and „laulan" I sing, with a diphthong where *u* is short. Further from the main stress, the quantitative relations are simpler, although in the

position of a joint stress various combinations and changes are possible.

Quantity in Estonian is not only a unique tendency of pronunciation but also performs important duties. In the first place it is an important phonological factor in distinguishing words by their meanings as is already clear from the examples given above („sada” hundred, „saada” to send, „saada” to get). Besides, quantity has morphological tasks to fulfil. In Estonian there is a large group of words, the only difference between whose genitive and partitive cases in the singular is in the quantity, for instance, „kooli” school, gen. sing. with a long *o* and „kooli” part. sing. with an extra long *o*; „metsa” wood, gen. sing. with a short *t* and „metsa” part. sing. with a long *t*; „laulu” song, gen. sing. with a short *u* in a diphthong and „laulu” part. sing. with a long *u* in a diphthong. Also in certain cases the differing quantity is the distinguishing factor between the nominative and the inessive cases: „taevas” heaven, with a short *e* and „taevas” in the heavens, with a long *e*; „kallis” dear, with a long consonant and „kallis” in dear, with an extra long consonant. Among verbs and other groups of words examples in plenty illustrating the morphological importance of quantity may be found.

Besides the complicated system of quantity, some other peculiarities of pronunciation in Estonian remain entirely in the background, for example, voiced and unvoiced sounds. The voice of the implosives *k-g*, *p-b*, *t-d*, and of *s* and *h* is firmly connected with quantity. The shorter the implosive or the *s* and *h* the more voiced they are. The π (posos) of the voice of an intervowel short sound may be, for instance about 5-10, in long ones about 2-5, and in extra long ones 0-2. The change in the voice of *h* in dependence on the quantity is especially worthy of attention. In the word „ihu” body, the *h* is mostly voiced; in the word „ihhu”, illative sing., in the body, the *hh* is almost unvoiced. A tendency which is worth attention accompanies what has been said and which must be briefly mentioned here. It is a general rule in Estonian that with the increase of the quantity of a sound, the intensity of the articulation also increases. If it is wished to emphasize the first part of some word and the first consonant is therefore pronounced more intensively and consequently longer, then an otherwise voiced consonant, like *l*, *r*, *v*, may become quite unvoiced.

In many languages the method of stressing is such that the vowel which is stressed becomes longer. In the Estonian language the opposite is the case. When it is wished to emphasize some word, the stress is laid on that syllable which is most important quantitatively. For the most part in Estonian the longest

syllable and the dynamic stress coincide, so that it seems as if the emphasis coincides with the dynamic stress. In words where in the first syllable in the position of the main stress there is a shorter vowel than the stress in the second syllable, as in the words „tule” come, „sina” thou, you, the emphasis always falls on the second syllable, which might be stretched quantitatively as one wishes, depending on the reasons for the emphasis. In Estonian dialects and partly also in the literary language, there are examples showing how the longest syllable of a word has acquired a dynamic stress, for example, „arvatavasti” probably > „arvatavásti”, because *s* is the longest sound in the word.

The Estonian language has this singularity that the quantity changes the quality of the sounds, especially of the vowels. Special attention must be paid to a couple of details. The qualitative difference between a short and a long vowel is not very great in the Estonian literary language and most of the dialects. In most dialects, however, the difference between the long and the extra long vowels is great. Most commonly the extra long vowel is formed by a stronger rise of the back of the tongue or a more intensive forward push and rounding of the lips. But an opposite tendency is found in some dialects in which the extra long is formed with lesser intensity. More significant than the change of the place of vowel articulation on account of quantity is the change in the articulation of consonants in the literary language. For example, the short *d* is prepalatal or alveolar, the long *t* is always post-dental, and the extra long *tt* is completely interdental. In this connection the influence of quantity on the palatalisation of consonants should be mentioned. The longer the consonant, the more it is palatalised. A preceding vowel always has the opposite influence: the longer the vowel, the smaller are the chances of the palatalisation of the following consonant, or the palatalisation may even disappear in such cases.

The reduction of vowels appears in many Estonian dialects. Even a vowel with a dynamic stress may be reduced, but not that vowel which is the longest in the word, for example, in the dialect of the Island of Hiiumaa „*mdalom*”, lower, where the first *a* is dynamically stressed but the second *a* is half-long. — With right has the Estonian language been held to be a strongly centralised language (Prof. A. PENTTILÄ, Jyväskylä, Finland), because in most cases it is really so, as the root-syllable of a word with the main stress is considerably centralising. Another Finnish investigator (Prof. A. RAVILA, Turku) has written that in certain word forms the Estonian language is also weakly centralising. Such a difference of opinion between two authors

may be explained by the quantity. That the nom. sing. „mets“ wood, and the part. sing. „metsa“ are strongly centralising, but the gen. sing. of the same word „metsa“ is always weakly centralising depends on the fact that already before the nom. sing. „metsä > „mets“ the implosive *t* had lengthened into *t*: : „met:sä“; the same thing happened to the part. sing. „metsäädä“ > „met:säädä“ and then only appears the present „met:sa“. On the other hand, in the gen. sing. the consonant union had been shortened and the vowel of the second syllable lengthened : „metsän“ > „metsä.n“ > „metsa.“. When cases of syncope, apocope, and all kinds of contractions began to be adopted the reason was not so much the dynamic stress as the quantity. That syllable in a word which was the longest became the nucleus of centralisation.

Finally it must be mentioned that the investigations of recent years have confirmed the presence of intonations in the Estonian language. The existing intonations are not independent but depend absolutely on quantity. If the first syllable is long or short, the intonation is steady (Germ. *Dehnton*). But if the first syllable is extra long, the sound rises in the beginning and then falls very appreciably. (In some Estonian dialects the intonation is developing independence. In these dialects the difference between the long and extra long is not so much real quantity as just a different pitch.)

There are other idiosyncrasies in the Estonian language which are closely connected with quantity. They are, however, beside the point and the examples presented have been sufficient to show the dominating part which quantity plays in Estonian.

WEDNESDAY, 20 JULY. AFTERNOON

FOURTH SESSION FOR GENERAL LINGUISTICS
AND PHONOLOGY

Chairman : Prof. A. JURET.

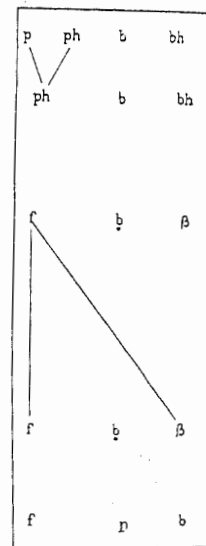
42. Prof. ALFRED SCHMITT (Erlangen) : *Phonetische Bemerkungen zur Germanischen Lautverschiebung.*

Der Ausdruck „germanische Lautverschiebung“ wird Ihnen allen geläufig sein, oder doch der im englischen Schrifttum dafür gebräuchliche Ausdruck „Grimm's Law“. Aber eine genauere Vorstellung von den Erscheinungen der Lautverschiebung werden nur diejenigen von Ihnen haben, bei denen es zum engeren Fachgebiet gehört. Ich gebe daher zunächst in einer

formelmässigen Darstellung einen Ueberblick über die wichtigsten Tatsachen.

Für die indogermanische Grundsprache nimmt man gewöhnlich an, dass sie an jeder Artikulationsstelle vier Artikulationsarten besass : Tenuis, Tenuis aspirata, Media, Media aspirata.

Beispielsweise in der Reihe der Lippenlaute setzt man also an :



Von diesen vier Gliedern ist in der Entwicklung zum Germanischen das erste in dem zweiten aufgegangen :

In der weiteren Entwicklung werden die beiden behauchten Verschlusslaute zu Engelaute, die Media zur sogenannten stimmlosen Lenis :

Es folgt die Entwicklung, die in dem *Verner'schen Gesetz* beschrieben ist : Der stimmlose Engelaute bleibt stimmlos nur unmittelbar nach Akzentvokal ; an allen anderen Stellen wird er stimmhaft und fällt mit dem schon bestehenden stimmhaften Engelaute zusammen :

Bei Beginn der schriftlichen Ueberlieferung aus germanischen Sprachen finden wir dann die folgenden Schreibungen :

Es ist also das *p*, das in der obersten Zeile am Anfang stand, in die Mitte verschoben, das *b* von der zweitletzten Stelle an die letzte. Daher auch der Name „Lautverschiebung“. Eine ganz genau entsprechende Uebersichtsformel lässt sich für die alveolaren und die velaren Laute aufstellen.

Vom phonetischen Standpunkt aus muss zu dieser Formel zunächst bemerkt werden, dass sie uns nur eine *Buchstabenverschiebung* bietet, nicht eine *Lautverschiebung*. Die Zahl der möglichen Laute ist, wie jeder Phonetiker weiss, unendlich gross. Es ist daher schon von vorn herein sehr unwahrscheinlich, dass die Grössen, für die das *p* in der *ersten* Zeile steht und in der *letzten*, einander völlig gleich gewesen sein sollten. Dazu kommt, dass wir alle diese Laute nicht unmittelbar kennen, sondern sie nur erschliessen ; über die genauen Einzelheiten ihres Wesens wissen wir also nicht Bescheid. Für die *indogermanischen* Laute versteht sich diese Behauptung von selbst ; aber sie gilt auch für die alten *germanischen* Laute. Denn was wir aus jener Zeit besitzen, sind ja nicht Laute, sondern nur Schreibungen, und wie unzureichend diese Schreibungen sind, wird besonders deutlich bei dem *b* (und entsprechend bei dem *d* und *g*) ; es gilt uns heut als ausgemacht, dass die damit be-