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ASPECTS OF SOME RESULTS OF EXPERIMENTAL PHONETICS

It is only after a great deal of hesitation that I have accepted the invitation of the Board of the International Significal Conferences. My hesitation was caused principally by the fact that in the presence of a significant audience each word seemed to me to be placed between quotation marks.

Meanwhile the speakers of yesterday morning have comforted me somewhat as they showed that the renewing of definitions is a part of our task.

Nevertheless some questions arise. Are the aspects I shall try to show you significant aspects as you want them to be? Are the results you ask me to speak about real results or merely preliminary observations? Still worse: is experimental phonetics experimental in the usual sense? Is it not only descriptive as most young sciences are? As to the meaning of the word phonetics, I had to choose a definition as soon as I started with it some thirty years ago. I took it that phonetics has to deal with all sounds serving the relations between living beings.

The cackling of the hen, the crowing of the cock certainly belong to the field, the question of possible intentions they have remaining quite apart. It goes without saying that human speech takes by far the largest part of the field.

Here a great difficulty arises. In speaking human beings make use of some system or another: the language. Half a century ago the message contained in the linguistic formula was estimated to be almost the only thing which might be caught from a spoken utterance, though it was admitted that a few individual features were added to it in speaking. Troubetzkoy initiated a new part of linguistic science, calling it *phonologie*, in English *phonemics*.

Phonemics calls relevant all phenomena that have a function in the system. The remaining are called irrelevant. Van Wyk pointed to the fact that a number of phenomena to be observed in speech do not belong to the system, but neither are quite occasional, a certain tradition determining their character. Van Wyk proposed to give a new name to the field situated between phonemics and phonetics. The proposal has not been accepted. Troubetzkoy in his posthume publication extended phonemics in the direction mentioned, so that it might cover at least a part of traditional speech phenomena. On the other hand it is obvious that phonetics has to treat them.

As in our days the spoken word takes a very important place, partly by the new possibilities originating from electro acoustical methods, but also by the increasing number of national and international conferences, the research of the whole of speech phenomena is of an increasing importance.

Which are the messages contained in a few spoken words? We need not wonder that more than one message might be transferred by the vibration patterns at the same time, as it is known that these patterns may be composed unlimitidly, whereas on the other hand the interpretation by audition, though it will not be unlimited, has wide possibilities.

What remains if we try to detach the linguistic message in a strict sense from the whole?

The remaining complex of patterns gives two sorts of informations, more or less static ones and more dynamic ones.

Data concerning the personality of the speaker are revealed, concerning his morphological and physiological qualities but concerning his psychological qualities as well. The latter are not restricted to temperament, but also bear on character as Heymans and Wiersma showed long ago. Finally the sociological circumstances of present and past of the speaker show themselves in his speech.

Perhaps more interesting still and certainly more to the point, is what may be detected in closer relation to the special speech deed performed by the speaker..

Which is his relation to the speech partner in this moment? Does he admire or detest him? Which is his relation to the contents of his words? Does he hope or fear that will be realized what he is saying? The informations the sound patterns give concerning these dynamic emotional facts may be of more importance than the linguistic formula itself.

Though for the hearer it is not difficult to divide himself for the reception of all messages at the same time, it is not simple to isolate

these in research. From the beginning this has been one of my aims.

In linguistics the word context is used more and more. Sometimes it means the linguistic surroundings. Sometimes it has a much wider meaning, indicating the whole situation in which the spoken words are embedded. This situation has a temporal and a spacial aspect, the linguistic context being a part of the former. The judging of the context is done intuitively, as far as I know. This is also the case in psychology and especially in psychological tests. Mr Vuysje and Mr Esser clearly showed yesterday that the language of the person tested or the patient may not be mixed up with the language of the investigator or the psychiatrist. But what is to be done with the remaining sound patterns, which until now even if they have been recorded, are judged only by the resonance they cause in the investigator, to use the word Professor Van Dantzig used.

There is still one other point. Interpreters in international conferences have to preserve the additional messages contained in the speech. If they do not, they deliver only a diminished copy of the original, but what happens if they do? Emotional sound patterns are not equal all over the world. Probably they are equal for certain groups whose languages show a high degree of cognation.

Resuming we may consider several levels in the whole of speech sound patterns. A first may be called: linguistic, a second deals with performance, a third contains psychological data concerning the speaker, a fourth does the same for somatic data.

It is not much we have done until now.

In 1930 I summed up informations derived from spoken words apart from their linguistic meaning. In 1935 I made a distinction between a linguistic and a biological component of speech. Miss Van Houwelingen compared melody in reading and speaking. It is a well known fact that in Dutch a difference exists between both. We used the term *Phonotypologie*, considering it as a part of *Typologie*. In describing the phonotypology of the Wieringermeer population the importance of social factors appeared. The inhabitants of one of the villages that had been surpassed by another, were speaking softly, whereas those of the dominating village: Middenmeer were speaking loudly with a clear articulation, especially in women. In 1950 Miss De Graaff gave a referate of the results obtained by Ledebor van Westerhoven, who had pronounced the vowel *a* in 32 different affective ways. At the same time I analysed the exclamation *evoë* which occurred at the end of each of 20 stanzas of a poem, the performer succeeding in expressing the contents of each of the stan-

zas in this exclamation. Here the question arose what may be expressed by sound. We may make a distinction between quantitative and qualitative phenomena. The first may refer to space, time and energy. They may be expressed by duration, energy and resonance. The qualitative phenomena all refer to emotions. The activity of some muscles as a reaction on certain emotions will indicate itself in the sound patterns. Trojan in Vienna has called these phenomena: *Akueme*, distinguishing some 30 of them.

At this moment two researches have not yet been finished.

The first concerns 20 students who uttered three vowels *a*, *e*, *o* in six affective ways (merryness, sadness, enthousiasm, disgust, kindness and anger).

Mr Pelsky described the characteristics of each of these sounds, whereas Mr De Nooyer presented them under the conditions of a psychological experiment, to 50 other students. By combining the results of both investigators it may be hoped to get some insight concerning the characteristic sound patterns.

Further on we presented simple melodies played on an enarmonium to learn their psychological and linguistic contents.

First 49 combinations of three tones were presented, the intervals being large (about a fifth), moderate (about a third) and small (about a prime) or zero. There was a large degree of unanimity concerning the psychological impression various listeners got, but as to the linguistic impression they often diverged. It appeared that the first interval was determining the psychological impression for a great deal, whereas the second interval was more determinant for the linguistic interpretation.

Hereafter we took 2197 melodies of three tones, covering all possibilities within one octave. Mr Meinsma, suggested that a distinct Dutch formula should be brought in contact with these melodies, the listeners determining whether both might be combined or not. As examples we chose three geographic names: *Apeldoorn*, *Ootmarsum* and *Oostmahorn*, having stress on the first, second and third syllable. Two listeners, one of whom possessed an absolute pitch, were asked to note whether the three names might be a statement, a question or a call (after Professor A. W. de Groot). The results of two names have been plotted. The plots show a great regularity. All possibilities principally are found in one of the quadrants. When two of the three tones were equal, often a call was recognized. To understand the variation between statement and question, it will be necessary to consider the exact value of the intervals and perhaps also tone quality.