Address from the Chair – 16th International Congress of Phonetic Sciences – 10 Aug 07

Ladies and Gentlemen,

After five intensive days of oral presentations, posters and Special Sessions, a short contemplation of where we stand in the Phonetic Sciences – a sort of "state of the union" address – seemed a fitting way to close the content-orientated part of the Congress, before we move on to the technical aspects of closure and passing the baton to the next organizer.

ICPhS is a mirror in which the Phonetic Science as a complex *whole* is reflected every 4 years. Of course, individual participants concentrate on their particular areas of interest and may get only a hazy picture of the whole.
However, the historical importance of this 75th anniversary year calls on us to consider the original ideas of the Congress founders, as Klaus Kohler has done, both briefly in his opening address, and in more detail in the Phonetica 50th anniversary brochure. But we should also consider the dimensions that have opened up since those early days and extended the scope of inquiry in speech research. We should examine whether they diverge in spirit from the ideas of the founders and ask whether they represent an acceptable addition or extension to them, or whether they distort and undermine them.

The central idea of the 1932 Congress – presented there by van Ginneken for his colleagues Kaiser and de Groot – was to bring together the scientific disciplines of linguistics, experimental psychology and experimental phonetics on the basis of their common interest in speech, to give them the opportunity to work together towards an understanding of the speech communication process. There was a clear understanding that the functional, the psychological and the physical formed a *triad*, the disintegration of which would be damaging to the common goal.
It was also in Amsterdam in 1932 that Eberhard Zwirner – president of the 5th Congress in Münster, 32 years later – laid the theoretical foundation to his *Phonometrie*, which was so often misunderstood by critics and to some extent even by his students – the latter often distorting it in its application by failing to recognize that *methodological stringency* is there to *serve*, not to rule.
The tripartite approach to the study of speech communication, the shared object of phonetic, phonological and psychological research was also his central thesis.

So we can ask, what's changed? Isn't it the goal of relating the different domains and levels of speech activity in the effort to understand and explain the processes of speech communication which is still the overriding and bonding element that brings all the diverse disciplines together every four years?

I think almost all of us here would say "Yes".
But the *world* has changed, *science* has developed, *methods* have mushroomed. The universal genius of the Renaissance is merely the polymath of today. But most of us who are less gifted are – thanks to the vast improvements in the accessibility of information – still able to develop a vague feeling for the overall picture, as we gaze through the glass darkly. But, with the exception of the polymath, we are restricted to a satisfactory understanding of only a small part of the vast selection of methods that are employed in speech research in its totality, each method designed to polish one of the stones that make up the huge mosaic of speech communication.

Changing the metaphor back to the family that van Ginneken invoked and to which Klaus Kohler applied the socio-psychological observation that children rebel and become independent, I would like to add another dimension: *Fertility.* Fertility has always resulted in the expansion of the branches in a family tree. Science is the product of the fertile human mind and has developed accordingly. The number of established branches that are linked directly to speech communication, and between which a relationship has to be explored and explained, has grown.

The "physical" dimension in 1932 was to a large extent the study of the articulators.
Since then, the acoustics of speech has emerged, grown, become independent and then been theoretically re-united with the anatomy and articulation of production. Thanks to speech scientists who were starting their careers at the time of the 5th Congress in Münster, acoustic modelling is such that we can predict the acoustic signal if we know the articulatory configuration (and the nature of the excitation). Acoustic studies, whether explicitly allocated to the "Acoustics" thematic area or not, make up a large proportion of the overall number of papers at this Congress. For many years, studies in language description have almost always been acoustically based, replacing the traditional IPA symbolic descriptions.

Valuable as such "objective" depictions are, there is a real danger of forgetting that they are only one side of the inherently two- (or three-) sided coin!!! Thankfully, the inherent subjectivity of auditory description that underlies symbolic IPA descriptions can be dispelled by publishing the recordings themselves. Our offer to all authors to include up to 10 MB of additional files for publication on-line and on the CD-ROM was – strangely – not taken up by the numbers we were hoping for. The founding scientists of the ICPhS would surely be as disappointed as we were.
But perhaps it is people's reluctance to make use immediately of "new-fangled" things – a trait that I had associated more with conservative Englishmen of my generation than with dynamic, forward-looking speech researchers.
Perhaps the take-up will improve at the next Congress.

Due to even more dramatic technological advances than those which launched the acoustic revolution in the 50's and 60's of the last century, another physical domain has emerged and increased in importance:
Neurological studies of speech have grown rapidly since the EEG work in the 70's thanks to new developments in neuro-graphic techniques. Neurological speech studies are so exciting because we know that the brain is where the transformation from the physical to the phenomenological – or vice versa – occurs. But there is a long way to go before the huge amount of data that is accruing about brain activity during the production and the perception of speech can be related to the *functions* of speech communication on the one hand and to the *psychology* of speech communication on the other. Completely new areas of the mosaic have come into being!

But the basic issue of explaining the triadic structure of speech communication, the relation between the physical, the functional and the psychological remains, even if the physical domain has become more complex, with its own tripartite structure: bio-physical, acoustic and neurological.
That the speech research community continues to pursue this goal is solidly documented by the large number of fine papers addressing aspects of production modelling, speech perception and phonetic psycholinguistic issues. Take, in particular, the Special Session "*Of Mouths, Ears, Eyes and Brains*".

The *functional* branch of the speech science triad – which we can loosely call phonology – has an increasingly complicated relationship with the other two branches. Like all products of the human intellect, phonology builds its structures and its formal system on a combination of axioms and observation, and it limits by definition the domains within which it operates. With physical and psychological data revealing ever more complex, no longer directly observable structures and processes behind the phenomena which fall within the scope of human observation, the elements, structures and even the boundaries of phonology have become fuzzy.
At ICPhS we do not expect a broad-based discussion of formal phonological representation issues; there are conferences and workshops enough to provide a forum for such phonology-internal issues. But the relationship of phonological categories, structures and processes to the physical and the psychological clearly has an important position in speech research. Five of the twelve Special Sessions examine that relationship: "*Between meaning and speech*"; "*Natural Phonology*"; "*Do phonological features have any reality*"; "*Biological grounding of phonology*" and "*Nasalization processes*". And that is *not* including the Special Session "*Sound to sense*", which explicitly addresses what Phonology excludes – the informational function of fine phonetic detail.

A thematic area which, by itself, reflects the growth in complexity of the triadic relationships is Prosody. Not only is it the area in which the *most* papers were submitted, it also covers the widest range of issues: from descriptive studies of regional variants and previously undescribed languages, through more formal issues of intonational phonology, prosodic-segmental interactions, morpho-, syntacto- and semanto-intonational relations, prosody in interaction, right through to prosodic features of different speaking styles.

I have commented on the expansion of speech science and the mushrooming of new methods, so I need to comment on the third factor mentioned earlier: *the changing world*. Although modern phonetics can be said to have grown from applicational roots (language learning in Europe, anthropological and missionary endeavour elsewhere), the issues that concerned the founding members of the ICPhS in the 1930's were unequivocally linked to *basic research*. At that time, the pursuit of knowledge and understanding in their own right was taken for granted. Applicational advantages were understood to result naturally from the increase in understanding that was passed on from the scientist to the practitioner.

That is clearly no longer the case, and whether you like it or not, it is often very much easier to get a research grant if there is promise of results with some sort of applicational relevance ("applicational" should actually be pronounced "commercial").

And there is nothing wrong with applied research. In fact quite a number of us here were probably attracted to speech research by practical issue that we felt we could solve if we knew more about speech. One big advance over the insights of the 1930's is, in fact, that understanding derived from basic research does ***not*** necessarily feed naturally into a solution for a practical problem. Applications have their own theoretical problems which call for their own research methods, and the thematic sections dealing with applied topics have been as important a part of this Congress as they have since Helsinki. The focus has, of course, shifted, and there has been an understandable increase in more technologically based problems.

There is a danger, of course, that applied research will start from an over-simplified theoretical position that itself needs querying. But it would be wrong to imply that, for example, speech technology work has merely deflected effort from important basic research. Firstly, the ingenuity of researchers interested in basic issues will always enable them to couch the theory in applied terms or to argue the validity of the questions within an applied framework. At the risk of contradiction, I would claim that the compromise between the interests of the fund-giver and those of the scientist has existed since the funding of science started (whether private patron or public organisation). Secondly, there is often a direct or indirect feedback from applied to basic research. One only has to consider the process of relativisation and refinement that the analysis of large databases with less controlled speech material has brought to "phonetic truths" from the laboratory experiments of the 50's to 70's of the last century.

The dependency of results on the speech material used is one of the truisms of experimental work. Its importance for speech production analysis is equally accepted whenever it is made explicit, but the general awareness lies much lower. Basic research questions that have recently been reinforced by the wish in speech technology to deal with different styles of speaking (synthesizing and recognizing emotional and expressive speech) highlight the need for a systematic approach to speech data elicitation. The topic was close to becoming a

Special Session at this Congress. Perhaps the embryo can become one of the new children at the next Congress.

To sum up the nature of the spoken-language research endeavour that has become apparent this week: There is every sign that the goal of our "founding fathers (and mother)" to create an interdisciplinary forum for the consideration of physical, linguistic and psychological aspects of speech communication has been realised. That aspect of ICPhS has become solidly established and continues, even though the ever-increasing complexity of the relationships and interactions that are uncovered make the synthesis of results to an overall picture as good as impossible. Just as strongly established are the descriptive phonetic studies, increasing our knowledge of the phonetics of less studied languages, and the areas of applied phonetic research.

I should like to close with the hope that in four years time just as many, if not more of the scientists working in the different branches of speech research will again come together – and we shall shortly hear where that is to be – to continue the tradition of looking over the fence of their own particular discipline.
Between now and then they will almost certainly have attended several conferences in their own special research areas, but that is necessary to strengthen the basis on which they interact with others. Progress is typically at its greatest when new ideas from one discipline are taken up by another. And the Phonetic Sciences in all their diversity are ideally structured to profit from that sort of cross-insemination. The International Congress of Phonetic Sciences is the forum par excellence where the seeds of such progress can be sown.