DISCUSSION OF SECOND ROUND TABLE

Huizing Sr.:

1) I would like to comment on a type of central deafness, which has not received much attention as yet. It is the type which is automatically induced by any type of peripheral hearing impairment present during early childhood, that means before the age at which a normal speech descrimination skill is more or less set. Due to lack of adequate stimulation the brain centres finally become underdeveloped as to discrimination ability or even undeveloped resulting a.o. in dysphasic symptoms, deaf-mutism, etc.

Take c.q. a case of Rhesus incompatibility with the well-known audiogram of the sloping type (10 dB/oct or steeper). Such a child can build up a speech understanding capacity only on the base of low tone discrimination which appears to be insufficient for obtaining good social hearing.

Therefore without special measures any peripheral impairment of early onset will be accompanied by a central one of pure **functional** origin. Thus in children basically we have to consider two different types of central deafness:

1. pure organic (congenital or acquired).
2. functional (gradually induced).

In many cases the latter one can be more or less prevented when after early detection adequate (i.e. acoupedic) treatment is given, preferably before other compensating communication skills — such as lipreading — have got hold on the child. These children need a unisensory approach (term of Mrs Marion Downs c.s.) in order to develop their potential hearing as good as possible.

2) I would like to ask your attention for a group of children in the age of 6—9 years, who now and then are referred to audiology centres because of learning difficulties in the normal school. Since we use our triplet test of speech audiometry — as presented during the Boerhaave course on audiological tests early this week, we have found in quite a number of these children triplet scores far below normal in spite of the fact that their pure tone threshold audiograms are completely normal over the whole pitch range for each ear in spite of the fact that their scores for PB-lists are normal or subnormal. In classroom these children have to cope with a lack of redundancy due to an underdeveloped cerebral discrimination ability, so that they have to exert more effort than normal hearing children in order to understand the teacher and their class-mates. This explains their difficulties in learning.

B. de Quiros:

I agree completely with the observations of Dr Huizing. We, Dr Bocca knows this perfectly, we employ much distorted speech-audiometry in these researches. We obtain the same results that Dr Huizing has pointed out.

Ewing:

It would seem to me, Mr. Chairman, that Professor Huizing's contribution has particularly indicated the need always to associate speech audiometry with the use of pure-tone audiometry in assessing the hearing capacity of children. As regards his "triplet testing" I am sure that it has very great value. Whether he would wish us to make this of general application in the School Health Service, I am not certain. But there is need for much further research, I think, before we could be justified in saying it is necessary. The main point that he made is, I believe, most important.

It was in 1889 that Alexander Graham Bell reported in England, before a Royal Commission, that it seemed to him that there was more profound deafness when children came to be of school age than had been found when they were younger. He said that it seemed to him that the **same** children were not hearing as much in their school days as they had been able to hear at the outset of that period. Now it has, I think, been clearly shown by many audiologists that a child can best become hearing orientated during the pre-school years. Last week, my wife and I had the opportunity of reporting to the British Association results of our recent experiments, still in progress, to find to what extent severely and profoundly deaf children can achieve capacity for auditory speech discrimination. It is, of course, by the age of 3 to 4 years that almost all ordinary children have learned to talk fluently. This seems to be possible for at least some deaf children.

For deaf children there is a risk that they may become visually orientated through not having the opportunity of auditory experience. On the other hand, there is a problem about the use of lipreading in association with hearing. It has been very clearly indicated in our own research that many deaf children cannot rely on hearing alone to an extent that it will give them adequate motivation in learning to talk (and there is no time to lose in the early years). It is the combination of the visual with the auditory experience of speech, including, of course, the auditory feedback that we have found to be most effective. For this training we have used auditory training units with collar- or hand-microphones. I have seen children in several places now, including my wife's school when she was still a headmistress, who had learned to enjoy hearing themselves read aloud into a microphone by the age of 7 or 8. She found it essential that both she and the deaf children should speak very closely into the microphones. This condition cannot be provided in the children's own homes all the time. We lend auditory training units to parents for part-time use. During the rest of the time the children are using wearable hearing aids. People who talk to them may be a good many feet from the microphone. A little calculation by an audiologist will show that in those circumstances speech does not always reach the microphone of a child's hearing aid at an intensity of 70 decibels which, for instance, is optimum for

our British National Health Scheme hearing aid. Last week, we had a boy of 17 who, in spite of a hearing loss of 95 decibels at 500 cycles per second and an upper frequency cut-off at 2,000 cycles per second has become able to acquire capacity to discriminate a small percentage of words in a test by hearing alone, if the test is taken very slowly. However, his constant comment when staying in our home was "I rely on lipreading to an extent of 90% for following what people say, although I use a hearing aid all the time" — and he won't be without it.

Berruecos:

I would like to point out that, in the discussion of the clinical study of children with problems in linguistic communication, we have not heard but comments on the exhaustic study of the process of investigation of the auditory phenomena. But no one has mentioned the importance of the study around speech production of those children. Penetrating into the auditory phenomena will always be a complex problem, especially when dealing with children. And the objectivity of such an evaluuation is not an easy task.

Therefore many clinicians have developed ways to investigate hearing in children that may be adequate, but they are often not so. The study of the speech production phenomena in children is extremely interesting. My comments on this problem will be brief. This study has been mainly undertaken at Central Institute for the Deaf, where the different types of problems in these children have been grouped into four categories: the silent type, the scribble speaker, the user of a few words and sentences and finally the echolalic. The study of linguistic production gives us enormous possibilities to reach a diagnostic point. But concerning Miss Filling's statistics I would think it is most important to stretch the team work specialization, in the observation of these cases she quotes not to be a diagnostic problem, in order to go further in the knowledge of this field. Thank you.

Sonja Filling:

To dr Berruecos: I want to thank for the remarks on speech production in children. Of course the team work of the different professional people in this field is extremely important. In our differential-diagnostic work we have been in collaboration with a lot of specialists from different hospital-wards. But I feel that not until pedagogical and other forms for therapy (for instance medical or physical) has been employed for some years will it be possible to make the correct and final differential-diagnosis in children with multiple auditory handicap.

Davis:

May I make a brief comment. It seems to me that in central dysacusis in children an anatomical diagnosis is likely to be impossible and probably unprofitable because of the capacity of the central nervous system to modify itself to compensate for any injury which has occurred. "Plasticity" is the word that I like to use for this property. Reorganization or compensation is

possible to a great degree and to a degree that is greater the earlier the injury has occurred and the earlier education and training have begun. What is important is the function that remains or is regained and not the anatomical structures that are lost. In other words diagnosis must become functional; it should be in terms of performance not structure. At the present time we are only beginning to differentiate functions into useful and systematic categories, but I think that the presentations today point the way for the development of the future.