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CLOSING REMARK

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Dr. Watanabe, dear colleagues,

I am very pleased that we have been called together in order to discuss these problems. The physiologists and clinicians are able to join forces in order to interpret the many phenomena centered around vibratory reflexes and vibratory stimulation in general. I don't know why I should be saying anything about these matters now, as, of course, my own experience lies very far back in time, in fact it was about 20 years ago that Henatsch and I did something on vibration in order to see whether fusimotor excitation increased vibratory following frequency of spindle afferents and found it to do so. And then in the laboratory Bianconi and Van der Meulen continued this work with a study of secondaries. But vibration was really studied long before our time by Paul Hoffmann, of whom I might say a few words. He is really one of the most important founders of clinical neurophysiology. He did many things, he discovered the silent period, he studied the vibratory reflex and he was very close to the final evidence for the monosynaptic reflex. I often wondered why, he, with all those good ideas on hand, never descended to animal experimentation. It would have been so easy for him to try out all those ideas and discoveries on the cat.

In his laboratory there was a young man, Johannes Sommer, who did interesting work on the Jendrassik manoeuvre and developed the theory that it was dependent on spindle activation. So that Hoffmann even had at his disposal the basic idea of spindle control. When much later Hagbarth

told me about the T.V.R., I recalled Hoffmann's old work, and oddly enough it was my expectation, when Hagbarth mentioned his own work, that its major importance would be clinical. I thought that this method would provide an easy access to problems of tonic control and that one by this technique would come to a deeper understanding of where the supraspinal centres of tonic control might be localized. That was my first thought at the time. And then came the development that we see now.

I shall come back to that in a moment, but I would like to say a few more words about Hoffmann while I'm here. Hoffmann was a very quiet and reticent but humorous person full of odd notions, a great original, very much liked by his students. I had him invited to Stockholm while Merton was with us and we had several talks with him. Hoffmann was very interested in the work that could be done at that time. Merton had arrived in his ship, a Dutch barge, kept in the harbour of Stockholm. He asked Hoffmann to a meal on the ship and I think they had a very good time. Once I asked some of his pupils why Hoffman never took to animals for experimentation and they said he had something against it. I don't know what it was, he may have had ethical objections to animal work.

Well, lets go on now and see what has happened. I think that - contrary to my expectations - what we see in physiology is that vibration has become a sensitive analytical tool. In this connection I would like to remind you again of the work of Bianconi and Van der Meulen because it was the first differentiation between primaries and secondaries by vibration and also because of the tragic death of Bianconi in an automobile accident. And then, following that paper, we have all become familiar with the advances in the field through the work of Matthews, Pompeiano, and Homma. This has been an exciting development. And finally

we have had Hagbarth and Vallbo taking up vibratory stimulation with their technique of recording from single spindle afferents in man. And that again has excited much interest in vibratory stimulation which has developed into a more important theoretical approach than one could have expected when one knew only of Hoffmann's work and the early T.V.R. reflexes.

One of the attractive features of this meeting has been - as I said - that physiologists and clinicians have met and been able to compare notes. I am not the right one to speak about the clinical work on vibration. When I get Hagbarth's papers I tend to read them like the Devil reads the Bible, backwards, in order to find out what is good for physiology. Hagbarth's aim is clinical and not to produce something just as a fall-out. He wants to find something that is good for diagnosis and cures. We have heard much about this development in Japan from the papers of Tochigi, Matsuda, Watanabe and Gemba. We have heard enough to realize that vibratory stimulation can be developed into a valuable diagnostic tool. We have also seen something of its importance as a curative technique but I suppose no-one at the moment would be willing to pass judgement on that, as it obviously is far too early. For us physiologists it has been interesting to see where you are in your attempts to put this method to use. I know that Hagbarth thinks that a systematic comparison with the normal in many clinical cases is of extreme value, trying both the T.V.R. and the unitary spindle response.

We can now pass on to thank the organizers, Dr. Watanabe and his secretary Dr. Ioku. Very much of our gratitude is due also to Miss Maruyama who has been constantly attending to our best interests. And if I may say so, the placing of this meeting in Kyoto has been one of its most attractive features. This, as we all know, is the old historical city

of the imperial time before the shogunates and it is a place that no-one can fail to like. I've now been here thrice and have begun to realize that Kyoto should be compared to a charming lady while Tokyo definitely is a male. But Kyoto had, of course, when it was founded many famous ladies; the one we read of in the western languages is Lady Shikibu Murasaki of the Genji stories which many of us have enjoyed so much. Having been here we can understand that an Emperor could retire to write poetry and put some young puppet Emperor on the throne while he himself was whiling away his time in Kyoto's lovely surroundings. We would have liked to be able to see more of them than many of us now could see, but it is important to let you know how much we appreciate the chance of being with you in this particular place. I think that the time now has come for us to rise for a most sincere, good applause in token of our gratitude.