## AFTERNOON SESSION

### I. Discussion on Papers of the Morning Session

CHAIRMAN (Dr. L. GUTTMANN, C.B.E., M.D., F.R.C.P., F.R.C.S.):

Ladies and Gentlemen, before we open the afternoon session with special papers, we shall have first a discussion on the morning papers. Time is rather short and we can only discuss them for about twenty-five minutes. Everybody will have to be brief and I can allow every speaker three minutes at the utmost.

The discussion about all the papers in the morning session is now open.

Mr. S. KENNOWAY:

I believe that this morning has shown that there is a problem to identify. I think it is clear that there are causes for dissatisfaction about wheelchairs, and before we go and re-design on an *ad hoc* basis, it is worth finding out what the users of wheelchairs really need. It is my experience in other fields of equipment that the intelligent user sees a lot more of the game than the manufacturers of equipment. I believe by doing a few quick sums that the Ministry of Health spends about £600,000 a year on wheelchairs, and with the normal costing in industry on products of this kind a company should allow for at least 3 per cent. of its turnover on research and development, and should therefore be able to allow £30,000 a year on research. If we accept that it costs you about £7000 to support a graduate, to allow for the cost of the laboratory, equipment and so on, you could afford to have three or four graduates working on wheelchairs on a continuous basis and nothing else, and it would be very convenient if you had mechanical engineers and physical engineers and ergonomics people working together. It would be convenient if they could support a laboratory somewhere of, say, ten or twelve graduates with a total budget of about £100,000 a year, and they could then work on related problems and we could have an efficient use of younger staff. We do not have a medical engineering research institute at all. I believe this is one thing which could come out of this conference. The Ministry of Health requires a research institute of its own. I also believe that when you look at wheelchairs you realise that there is complete room for technical improvement. I also must say that I was very impressed to hear Mr. Dunham talk about the organisation which is supposed to employ disabled people. Why does it not, as it is supported by public funds, use its organisation to act as a pilot study as to how disabled people should be used in industry. Why should it not propagandise methods for industry in general instead of using them to profit in its own factories?

LADY HAMILTON (London):

I want to support what Mr. Denly said about the need for some group to study the users of wheelchairs and find out what they are capable of teaching them, using the best techniques. It seems to me that there is a diversity of opinion between practice in this country and, say, in America. At the University of Illinois I know there are students getting rehabilitation, and there are two hundred of them, seriously disabled, going to the university with the ordinary students. This is a very large group, and of these I should say over half are paraplegic and spinal lesions, polios, or some other cause, and they find that of all the students that they have, there are only 3 per cent. who need detachable armrests. They are taught to transfer themselves to and from their chairs by other methods. If the Ministry of Health is now issuing all chairs with detachable armrests, making them more expensive and making the chair quite a lot heavier, I wonder if they have ever considered whether or not it is possible to teach people to use some other way to avoid this expense. I think this is the sort of question which could really be well studied by setting up some sort of organisation to make the study, and what I should like to see

come out of this meeting as one of the resolutions is the proposal for setting up some organised study on this subject.

Mrs. WEDGEWOOD (London):

I am a wheelchair user. I should like to dot the i's and cross the t's of what Lady Hamilton has said. My chair had detachable arms. I found I was therefore unable to put it to the side of the flat where I wanted to put it; and so the armrests had to be bolted down to make them permanent. This added enormously to the weight, because there were the detachable armrests plus the weight of the extra bolts. It is also meant that the chair had to go back to have the detachable armrests fixed—it is grotesque.

Dr. MCKENZIE (Leatherhead, Training College):

I find myself in the rather invidious position of agreeing with a lot that Dr. Jolly has said. He does not know me in person, but he knows me well by correspondence. I find myself in the odd position of always being at loggerheads with the Ministry of Health and now getting up to defend them wholeheartedly.

I get a little annoyed to hear people get up and say that in America they can do so-and-so and they have magnificent chairs and then get up and quote a ridiculous example in this very same room. 23,000 chairs are provided to disabled people free of charge. Is this not a bit ridiculous? As I say, I find myself in the position of having to say this. Let us be realistic about it. The majority of people do have satisfactory chairs issued to them and they appear to be happy with them. If they did not have them they would be in a considerably worse position than they are at present. There is no doubt about this, and I speak from personal experience, that if you have got to have a standard model, the 8F is far the best for the majority of disabled people. There is, of course, the question of the most suitable chair for the highly intelligent disabled—this is another deviation which is not made. There is the question of the young severely disabled and the old severely disabled, the young intelligent severely disabled and the young not so intelligent severely disabled.

This is a viewpoint that occurs to me this morning listening to the discussion. It seems that we are all too ready to criticise, but at the same time I think we should equally be truly grateful that by the simple signing of a form we can get the vehicle for the patient with all sorts of alterations. I should like someone to be good enough to tell me what other countries in the world there are that do this.

Mr. J. WALKER:

I should like to deal with the point Mr. Kennoway made about the cost of wheelchairs. I do not think that the Ministry of Health spends anything like £600,000 annually on wheelchairs. Off hand I do not know what it spends, so I cannot tell you. He spoke about research. I am sure he is quite right that first of all we need to know what the invalid really needs. I was also taken to task by Mr. Dunham, I think referring to another point. Everyone wants to carry everything on their wheelchair, but the stipulation is that it must not weigh anything and as far as we are concerned it must not cost anything. We tell the manufacturers, but they never seem able to meet these requirements. On the question of research we need to find out what is required, and I think one is in danger of falling into the habit of thinking about research and forgetting all about development. I think there are two distinct fields to be considered. We need to find out what is required and find out where research is required and then one must start to develop. The design and development aspect is equally as important as the original research because without it one never gets the right answer.

Now Mr. Denly speaks about user analysis and the percentage of users who require this kind of chair or other kind of chair. I wonder on what Mr. Denly's figures are based, because I believe by members of the Disabled Drivers' Association—out of the 15,000 invalid tricycles we have in service—he is speaking for 20 per cent. There might be some reason why this may be contrary to Dr. Jolly's.

I personally feel that we must sooner or later get down to standard wheelchairs and must think in terms of standardisation. We are never going to find one chair to meet the overall requirements of all patients who are wheelchair users. But we must have standardisation and we must endeavour to have a standard wheelchair. I should like all the manufacturers ultimately, I am speaking personally, to make one wheelchair, one range of wheelchair, using standard components. I have an idea in my mind which may sound like Utopia and may sound fantastic, and it may not be practicable. I would like to think in terms of someone measuring the patient—I think one should measure the patient and perhaps have a sort of chart on which one lays down the requirements, and then out of store we would draw the bits and components and make it up. So instead of wheelchairs we have components and we select the components to produce the requirements of the invalid.

Mr. C. DUNHAM:

Mr. Chairman, would he tell us what research is now being undertaken on wheelchairs and how they collect their ideas at the moment?

Mr. J. WALKER:

If I may I will take the last part of the question and leave the first part. Ideas are collected from the users as much as it is possible to do so. I would quote what is really the Ministry policy and that is that the policy underlying such research is to try to give the user what he wants. Now we have difficulty in finding what the user really wants, there are so many conflicting views. But we try to meet the user's requirements as they are portrayed to us by either the user or the doctors concerned.

Mr. C. DUNHAM:

And what research is undertaken independently by the Ministry?

Mr. J. WALKER:

That is a question I would defer. I would need to have further notice.

Mr. O. A. DENLY:

Could I just say where I got this analysis from? We have got a membership of 3000 in the Disabled Drivers' Association and we sent out a questionnaire and received replies from over 50 per cent. of the membership, which so far as sampling is concerned is way above that for most of this kind of questionnaire that is carried out. But of course I accept Mr. Walker's point that our figures are entirely different from the Ministry's figures. Our survey showed that the age distribution was under 20, 3 per cent. of the membership; between ages 20 and 50, 50 per cent. of the membership; over 50, 46 per cent. of the membership. This compares with the figures of the Ministry of Health and underlines the point I made earlier on the question of trying to draw conclusions about the percentage of elderly and the percentage of young people in terms of activity. It so happens that the Disabled Drivers' Association as an organisation represents the active ones rather than those merely living in their own homes. It bears out the fact that there is a higher percentage of younger people using wheelchairs in this way.

Mr. S. KENNOWAY:

Could I just explain a point? Of course I was not only referring to market research. Obviously the first thing we must do is to identify the problem. I meant clinical and technological research should be included in the later development stages and I agree that this is absolutely necessary. On the question of standardisation, as an engineer I sympathise with Mr. Denly's figure when he says that 15 per cent. of all the patients going to

Dr. Jolly are youngish and the chances are that they will live in the wheelchair for twenty or thirty years. It the average length of issue of a wheelchair is five years and that applies to 75 per cent. of the patients, on that basis the young disabled persons outweigh the elderly patients and therefore I think merit consideration on a non-numerical basis of chairs alone.

Dr. M. AGERHOLME (Lecturer, Nuffield Department of Orthopaedic Surgery, Oxford):

I practically never go to meetings about wheelchairs because I always find the same trouble arises with various groups popping at all the meetings saying that they represent some group of disability, which is absolutely horrified at the things that the Ministry prescribes and saying that it is absolutely wrong, but they are seeing only one bit of the picture and are speaking from the point of view of one disability. I think that has been illustrated here by the discussion we have already heard as to whether armrests should be detachable. This illustrates the way people talk about an idiotic attitude when they start talking about chairs provided with detachable armrests. From my point of view, working with the most severely disabled, particularly people with severe upper-limb disability and rheumatoid arthritis and a wide variety of other cases, I go round saying how idiotic the Ministry used to be in providing chairs with fixed armrests. I do think that there is no absolute truth in this.

I always enjoy listening to Mr. Denly. He always stimulates me and provokes me thus performing a very useful service. But also I find myself muttering always when he is talking that again he represents only a certain group. I believe that 70 per cent. of the chairs issued in fact go to the elderly, and in spite of the way he can justify the preponderance of youth and their importance I still think one has to take the elderly into consideration.

I do rather feel on this aspect that we must accept that occasionally someone like Mr. Denly should be prepared to go out and buy himself the wheelchair that he wants, because he is one of the people who uses his wheelchair for employment. I am sorry, Mr. Denly, but I felt this very much. I feel that we can spend a certain amount on this, but that there should be a certain limit, and that we must therefore regard this as a whole field and not restrict it to a certain group.

I feel strongly, that where we are all going wrong, speaking as a doctor particularly, is, I think, that as a profession we are very bad on prescribing the chair. This was illustrated by Mr. Denly on the point about getting the chair of the right size. I do agree and this is a thing I personally have been prodding the Ministry on for some time. I should like a prescription form which we could fill in intelligently; in fact we have, as you know, our own variation, because with the standard form I cannot possibly get for my patients the sort of wheelchair they require. This is something on which I really would like to see a modification. It would make the job of prescribing more effective and many fewer mistakes would be made. It is not only a question of whether the armrests can be detached.

Finally, this business of research that everybody is asking that we should spend money on. I feel very strongly that we must not just have the engineers in the laboratories. It must be done in relation to the patient or they will produce beautiful wheelchairs which are no use.

Dr. D. W. JOLLY:

I think I have not very much to say that I might be allowed to say at this point, except to say that there was one statement which was made this morning that is not quite true, and Mr. Denly made it, and that was that no Everest and Jennings chairs can be prescribed for patients under the National Health Service. You, Mr. Chairman, know that this is not true. The proviso is that if a consultant says that the only means of meeting this patients needs is by providing an Everest and Jennings chair, an Everest and Jennings chair will be supplied.

Dr. J. J. WALSH:

There has been a lot of talk and a number of people have stressed the importance of getting standardisation. But it is all too obvious that there are quite conflicting requirements from the different groups of wheelchair users, and we are not going to get a single standard. There are the large number of elderly wheelchair users and also all the young, active, working disabled persons, and I think that the Ministry as far as those are concerned should consider at least two different types of chair.

Dr. D. W. JOLLY:

May I come back on that? When we talk about a standard chair, we mean a standard frame for a chair with many possible modifications, these modifications being made to meet the needs of various groups of disabled people. From the production point of view I am sure Mr. Kennoway will agree that to have to build one or two often will make the supply position, which at times is bad enough, very very much worse. We have to have some means of meeting a very large demand of something like 13,000 chairs a year.

Mrs. WEDGEWOOD:

May I ask Dr. Jolly whether he can increase the distribution of his handbook? It is not a terribly good handbook, but no doctor can prescribe a chair properly without the handbook and it seems funny that doctors cannot get hold of this handbook. It appears to be limited in circulation, one per hospital, and the one copy may be with the orthopaedic or geriatric department and each consultant concerned is therefore unable to have one on his desk. It is a very ungenerous distribution of the handbook, and it ought to be more widely used. I am not sure that the general practitioners ought not to have a copy too, so that they would have an idea of what is available.

Mr. G. E. JOHN (Supplies Division, Ministry of Health):

I had not expected to speak today. I thought our, and my, function in particular was to sit quietly and be shot at. I may say I am delighted to find this afternoon that so many friends are coming to our defence.

I will not be expected to comment, I know, on many of the things that have been said here today. It is sufficient I think to say that we are listening to everything with great interest. And it is being recorded mentally if not otherwise and will influence what we do in future.

On the immediate point raised by Mrs. Wedgewood, there is an ample supply of the Ministry's handbook and it is distributed to every hospital management committee.

Mrs. WEDGEWOOD:

One copy.

Mr. G. E. JOHN:

It went to all hospital authorities, and we have no means of knowing, if they do not tell us that they want more. When they were issued we added a note saying, 'If you want more copies, please tell us and they will be supplied.' I myself have met hospital consultants who are prescribing and who say that they have never seen the handbook. In one case it was in the Hospital Secretary's drawer. This is something, of course, which is very difficult to put right. But the stocks are there and we use every opportunity of telling the hospital that they are there. It is up to them to ask for them, we cannot force them down their throats, other than by sending someone physically to deliver them—but there are plenty of the handbooks. We get requests not every day, but every week, and they are always filled.

Mr. T. H. WAVISH (Disabled Drivers' Association):

Mr. Chairman, we have heard quite a lot about the needs of users of the normal type of wheelchair. Now our Association finds that there is a considerable need in the case of the very badly disabled for the electrically driven chair, such as we were shown in the Swedish slides. We do feel that a consultant should be able to prescribe one of these chairs as being necessary for the patient just as much as prescribe the ordinary chair or tricycle.

CHAIRMAN:

Thank you. We have had a very fruitful discussion and we have to close the morning session's discussion now. But before doing so I should like to thank all the speakers who have given us these excellent papers and all who have taken part in the discussion. I think everyone will go home with some thoughts and inspiration and I am quite sure that this is a good beginning.

I shall now ask Dr. Dalzell-Ward to take the Chair for the next session.

## II. Discussion on Design and Manufacture

CHAIRMAN (Dr. A. J. Dalzell-Ward, M.R.C.S., L.R.C.P., D.P.H., F.R.S.H., Medical Director, The Central Council for Health Education):

Ladies and Gentlemen, before I introduce the two opening speakers for this session, I should like to thank the organisers of this Conference for their kindness in inviting me to take the Chair for this part of the programme. The part to be played by the various organisations has been well established, and also the part that the education agencies have to play in this particular kind of work.

Now to open the discussion this afternoon we have two eminent speakers who have devoted all their working lives to technologies which are fundamental to the special problems of wheelchairs.

Mr. Bunyan, who is going to be the first speaker, is well known to doctors, especially to doctors who served in the Armed Forces during the recent war, as the inventor who developed the system which was of enormous benefit to humanity for the continuous irrigation of burns. He tells me that he himself was the founder of the Medical Engineering Development Trust, which is, at least in part, an answer to the speaker who recently said that we have no medical engineering research organisation in this country. We do not have it at university level certainly, but this is an independent organisation financed by public subscription. And Mr. Bunyan in fact employs six engineers on research in the laboratory at Bournemouth, and if anyone originates a new idea in medical work, mainly appliances, and thinks that it could be developed, he can take the idea along to him and they can develop it and make a prototype.

Mr. Bickerstaff is Managing Director of Richards, Son and Allwin, and is connected with various other companies in addition to the company mentioned here. He tells me he is also interested in Tan-Sad Holdings, and I suggest that that firm is also a producer of vehicles which are of a kind which have certain characteristics in common with the kind of production methods and materials we are considering. Mr. Bickerstaff has been a production engineer all his life and he wanted me to say that he started on the shop floor and that from the point of view of the manufacturer he knows the job right from the bottom upwards.

Now I am going to ask the two speakers to give us their opening statements, and I am then going to invite discussion.

Mr. JOHN BUNYAN (Director, Medical Engineering Development Trust):

Having listened to what has gone before, it is quite obvious that there is a need for