

increasing steadily, we have come to realize that it is of greatest importance to work out a common and comprising key of documentation.

Our contribution is a proposal for the establishment of the patient's history as well as the clinical report suitable for the computer. Naturally the orthopaedic point of view is emphasised in our proposal. We would like to co-ordinate our programme with that of other specialists concerned so that we would be able to develop a common documentation system within the following months. This would give us the possibility to survey the whole material in a more systematic way, which would certainly be of great help to establish more special units for the treatment and habilitation of children with spina bifida. In our opinion this seems to be of great importance, especially for countries without national registration of congenital malformations.

Our system is based on the usual punch-card form with 80 columns on each card. Dates of general interest such as date of birth, age, sex, twins, etc., are set down in the first columns. Sixty-one columns are left on each card for the special history and the clinical report. From our experience we learned to restrict the documentation to some few cards otherwise the wishes of trained specialists could jeopardise the whole system.

We hope to be able to improve and correct our attempted documentation system to hand it over to other clinics and special centres.

Discussion

CHAIRMAN. Thank you Dr. Parsch for your detailed report on this subject of paraplegia—spina bifida—which is of increasing importance. Some years ago we discussed this problem in one of our Scientific Meetings not only with regard to the paralysis as such but with regard to the deformity and other complications which can be avoided by an early and proper management. I do congratulate Dr. Paeslack that he has set up a special ward for these children as Dr. Gregg has done in Dublin and who will give us a paper on the subject. I am quite convinced that this will result in promoting new and important knowledge in our work. We started at Stoke Mandeville in the early 50's to treat spina bifida cases which we got at that time from Dr. Barnardo's Home in terrible conditions due to initial mismanagement. If, from a social point of view, we want to help these children and prevent them from developing into hopeless paraplegics later, I think the answer must be that every spinal injuries unit should have a special department for this kind of patient.

I now open the general discussion.

Dr. YOUNG (U.S.A.). (No detail of his remarks available.) Dr. Young reported about the book on classification of diseases as compiled by the International World Health Organization. He stressed the shortcomings of this book and suggested that this book should be revised as soon as possible as far as paraplegia and rehabilitation is concerned.

CHAIRMAN. We have discussed the value of this book previously and I think we are all unanimous that this is an unsatisfactory document and unless revised no computer will help us to classify our subject according to this book. I think the time has come that our American colleagues should take steps to revise the whole thing. As Dr. Young quite rightly said, he cannot talk for the U.S. at large because there are so many and everybody has his own classification.

K. LEMBERG (*Germany*). I have the feeling that there is a terrible danger to mix up classifications of very different points of view. When I am speaking to a colleague of any country I can make understandable to him the neurological findings and I can make understandable the scientific facts, but when I have to speak for instance to an insurance company it is not always wise to use those words. For our purpose I think it is quite clear that we can find a common language in the field of scientific statements and I think we should do it. The difficulty will be when we take the point of view of rehabilitation, here it is very difficult to find a common language because the situation is different in the various countries and we are using different words. I think it will be the most difficult part of our work to find a common terminology in this field.

W. S. KERR (*G.B.*). I think this has been a very interesting morning indeed. First of all, Dr. Cheshire's report, giving a classification on ability—I found this absolutely fascinating. There was one point that I thought we should emphasise in Dr. Cheshire's classification. If you turn to his incomplete group E and his group 3, no recovery in cervical lesions, he states these patients are rarely employable outside the home unless of high intellect. I think we will probably all agree with that, but I have suggested to him that we should have an additional point, the level of the cervical injury: for example, a C6, with no recovery below the level is unable to do much in the way of transport as he has very little hand function and employment will be very difficult. Whereas, a C8 with a good triceps and some quite good hand power may well be able to work as a telephone operator whether or not he has high intelligence. So, one does want to add to this classification the actual level, noting particularly the very big difference in a C6 and a C8. The other point I would like to mention is this question of documentation. In Edinburgh, about 1962, I started a documentation using punch-cards, and the system was published in our journal three or four years ago. One of the very great difficulties is to find enough columns of an 80-column punch-card to cover everything you want to do. For example, we have just heard from Germany how you can spend column after column on the orthopaedic treatment of a spina bifida. I gave my paraplegics two columns for orthopaedic, one column at the time of initial admission to hospital, and another three or four columns further on for the final state. You can't possibly cover it all. And, when one comes to the question, say, of deformities and contractures I simply say on my form whether it is present or absent. If it is absent, well you don't need to study that any further: if you find contractures are present, or other deformities, you will have to dig out all the relevant case notes and study them in detail or set up yet another form to cover that. It is really impossible on 80 columns to cover every detail you would like—clinical, social, psychological. You can only, in one form, give a general picture and then you must either have further forms or refer back to the case-notes.

F. W. MEINECKE (*Germany*). May I ask one question of Dr. Michaelis? You have spoken about ability, for instance, ambulating—what do you mean, with or without interruption?

L. S. MICHAELIS (*G.B.*). I have intentionally not included the length of time or the distance the patient can walk because I think that would give a lead for a general form which we must be careful of. I don't know whether you feel, like me, that one of the dangers in engaging in all this is that your classifications become too complicated. You ask yourself who is going to fill up these forms, and you will get into real trouble because you won't have any time and you won't have anyone who is going to do it for you. I will have to go into this when we arrive at a proper number of headings which we are going to consider. There must be a limit, otherwise it becomes impracticable. May I say one word to what Dr. Young brought up, very rightly. Before I started on my little classification by drawings—it occurred to me that it might be unnecessary to do this because the World Health Organisation might have devised a classification themselves. So, I wrote

to them in February this year and got a rather surprising letter back. It appears that the question of paraplegia in rehabilitation was excluded from further consideration for the time being, the reason for this being that (1) paraplegia in their view is no disease, this is a symptom complex either due to diseases or trauma, and so it was altogether omitted for the time being; (2) it also appears that with rehabilitation they felt the field was so confusing that they couldn't enter into it. Now this meeting is, I think, a good place to try and evolve a formula with which we could persuade them to look again. Unfortunately, we will have to wait a long time because the next meeting of that committee is in 1975. So anything we say now, if adopted, would not be discussed there for another six years and not printed probably for another three.

G. M. POOL (*Holland*). We had wonderful papers this morning from Australia and from Michaelis. I think that the weak point we always will have in classification of our patients is that we don't know enough about the sympathetic system—that's the system which made the heart of those moonlanders beat twice as fast as normal, that is the system which gives us bloodflow in our face when we are afraid or ashamed, that is the system which is important not only in the paraplegic's system but this is a problem in the whole of medicine.

Professor ASCOLI (*Italy*). I should like to draw your attention to the possibility of the multiplicity of spinal cord lesions. There is the possibility that there are two or more. This is a typical example: a patient comes to you with a high lesion, dorsal or cervical, and these lesions have in time a good recovery with regards to their bladder—a good reflex bladder. Sometimes, however, this doesn't happen after two or three months the bladder does not become a reflex bladder and the situation is not good. I have asked myself several times why that is, and the explanation of this was that there are two lesions, a high lesion and a low lesion. With regards the behaviour of the bladder, we must think of the possibility that there are two or more lesions at the same time at different levels of the spinal cord.

Professor JOCHHEIM (*Germany*). I think that the difficulties in language is not only in the field of paraplegia, it is in nearly all medical fields in the moment when collecting data. But we might have the advantage to be a relatively small group with good knowledge of each other—we might get on a bit quicker than people in the other medical fields. Looking upon our papers in the morning, we had three problems, First the neurological classification which, I think is quite easy to get under control by a panel to wipe out the discrepancies between the French and English groups. The second point is the disability which includes function and compensation which might be worked out by a panel too. The third part; the reduction of working capacity, is the most difficult part and this seems not to be ready for a panel but may be ready for discussion for the next meeting so that all of us prepare something for this important problem. This is my proposal.

J. COSBIE ROSS (*G.B.*). A few years ago I did make a suggestion about the classification of the neurogenic bladder, and the traumatic ones, of course don't present much difficulty—they fall into three groups I think—spinal shock, the reflex or spastic bladder and the autonomous bladder. I think we should remember the classification of the neurogenic bladder of a non-traumatic origin. I hope in the near future we shall be hearing more about the spina bifida bladder, but the group I suggested was firstly the uninhibited bladder, the sort that one sees with disseminated sclerosis, secondly the atonic bladder, the type of bladder seen in the tabes, and a third group—a different group—I would describe as idiopathic of which the explanation is rather obscure. But this is a very simple classification and it does cover, I think, the main points and so far has not come in for any undue criticism.

W. S. KERR (*G.B.*). On this question of work ability, those of us who work in Britain may have had to fill in forms for the Department of Employment and Productivity, which used to be called the Ministry of Labour, and they have a remarkably useful, very small form called a D.P.1—a disabled person's number 1 form which shows for the Disablement Resettlement Officer a certain amount of work ability, can the patient push or pull, can he work sitting, can he walk, can he climb stairs and so on. This form is possibly something we could work from and elaborate.

CHAIRMAN. Summarising the discussion about this subject of classification we have heard some very interesting papers, and I should like to thank here in the first place Dr. Michaelis for starting the questionnaire on classification. He has great merit in this. I also would like to thank all other colleagues for their interesting contributions to this complex problem. I found the general discussion very useful and instructive although from all the papers and the ensuing discussions some of you might think we are now more confused than ever. However, being an optimist, I hope we will sort out the confusion in due course.

Dr. Parsch has given very detailed views about classification of a special subject of spina bifida and we look forward to the more concise classification from our friends in Heidelberg. Professor Jochheim has now proposed the setting up of a panel to try to co-ordinate the various views expressed, in particular the discrepancies between the French and what is called Anglo-Saxon views on classification. You may remember that when we discussed the matter first that I made the suggestion to set up such a co-ordinating committee, and I hope that will be done in the near future. Thank you again for your excellent contributions.

AN OUTLINE OF RECENT WORK ON THE SPINAL CORD OF THE CAT

By Professor C. G. PHILLIPS, F.R.S., F.R.C.P.
University Laboratory of Physiology, Oxford

IN introducing this Session on Spinal Shock, I shall try to give as briefly as I can, and illustrate by a very few of the leading experiments some glimpse of today's neurophysiological picture of the lumbosacral spinal cord of the cat. Because the Society's interests are centred on the physiology of the spinal segments after their partial or total disconnection from the brain, I shall draw largely on the work of Professor Anders Lundberg and his colleagues, first in Lund and now in Gothenburg. They have been studying the suprasegmental control of reflex arcs and investigating the remarkable differences between the patterns of segmental reflex activity seen in the cords of 'decerebrate' preparations on the one hand and 'spinal' preparations on the other. From such a large volume of relevant work, any selection cannot help but be arbitrary, and in trying to present such a selection succinctly, some degree of dogmatism seems inescapable. Therein lie great dangers of creating, in the minds of readers and audiences, undesirable vested interests in the details of an oversimplified story. One's hope is rather to encourage those responsible for the medical care of patients with spinal injuries to make and maintain contact with an exciting and enlarging field of experimental work.

The spinal cord (fig. 1, S) is the nerve-centre of trunk and limbs. It contains