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DISCUSSION

Dollfus, P. (France). In discussing Dr. Frankel's paper, the situation on the Continent, at least in some places, is not the same as at Stoke Mandeville. We have a lot of drugs but not enough physiotherapists, and the question I am going to ask is if any member of this Assembly has any experiences of the Bird Respirator which might be, I think, very useful, especially in certain cases of thoracic and especially cervical injuries. Sometimes we have in the very acute phase, that is some hours after the injury, a very low vital capacity and we know that tracheostomy can be dangerous for several reasons. Anaesthetists are now using post-operatively more and more the Bird Respirator which is a triggered respiratory help, and I wonder if anybody could give us his opinion about this subject.

Lipschitz, R. (S. Africa). As far as the Bird Respirator is concerned, we have six Bird Respirators in our Unit at the moment. They are of paramount importance but one must remember that the tubes leading to and from the patient are prone to infection. Therefore, when a tracheostomy is carried out, any procedure whether it be sucking the patient out or washing him out with saline must be carried out with the same meticulous care that we use in passing the catheter. This is the crux of the situation. We do it under what we call 'Recovery Room Special Care Attention'. We don't use it by mouth we use it by a plastic tracheostomy tube and the cuff must be let down regularly. But it is a magnificent instrument if used correctly, easy to control and triggered by the patient and very comfortable. Occasionally, we find that with the chest in a stove-in injury the Bird is not powerful enough, it can only give a positive pressure up to about 20-25 though officially it can do more, and then you might have to change to an Engström which also gives you a certain negative pressure.

One of our big problems has also been fluid replacement, and I agree that if you use these charts you will find that you have to give a patient more blood than almost he weighs himself. We have got over that, I don't know how well, by using central venous pressure monitoring and adjusting it on that. At the same time with the high replacement of blood we have got ourselves into awful trouble unless we do the pH of the blood and the PCO₂ and adjust the bicarbonate accordingly. There are certain papers coming out on that. The third thing that we have used, and we believe to be of benefit though we are not sure yet, are massive doses of cortisone, by that I mean 2,000 units two-hourly, until the patient is out of shock. This is in the literature already and we think this might be a good thing, but I was delighted to hear that people are doing away with charts because we found that our patients are coming over-transfused.

Dollfus, P. (France). What about the Bird without a tracheostomy, with a mask to avoid the tracheostomy?

Lipschitz, R. (S. Africa). We found that it slips, it's too irregular on that, and we'd rather use it under theatre conditions with a tracheostomy.

Grossiord (France) (translated by Dr. Dollfus). We have been using the Bird mostly as an assisting measure, especially in poliomyelitis cases with severe scoliosis, who have a respiratory inefficiency, especially before and after grafting when this is needed. I have no experience of the Bird actually used in the very acute phase of paraplegia, only a few days after.

A further point is that there is no negative pressure which can be used in the Bird machine.

Dollfus, P. (France). I think that in the Bird Mark 8 there is a negative pressure assistance.

Hardy, A. G. (England). I would like to make a few comments and ask two questions. The first comment is one of surprise in that in this question of dealing with associated injuries and complications nobody mentioned unilateral paralysis of the diaphragm in cervical spinal cord injuries. It has been our experience in Sheffield that we have had this complication which did require early recognition. The second comment I would like to make is in regard to the association of head and spinal injuries. Dr. Silver very rightly said that we didn't often miss head injuries with cervical spinal cord injuries; the reverse is not true. I think we need to diffuse the knowledge that cervical and other spinal cord injuries are often hidden by a head injury. And, I think it is up to us to pass on this experience to our other colleagues. Certainly in Sheffield we have had a number of cases in which a spinal injury has been missed because of a head injury. There are two questions: I would like to ask any of the speakers what troubles have arisen from the failure of early recognition of a fracture? The second question is, have any of the speakers any special measures for handling cases of paraplegia with multiple fractures of the pelvis?

McSweeney, T. (England). Dr. Hardy's last question: multiple fractures of the pelvis without dislocations of the hip are best left alone. I am quite certain of that. The answer to the first question is 'very little'. The failure to recognise a dislocation is quite another matter: A fracture of the long bone—very little trouble. The Bird Respirator, I am sure you know, you can use—excluding cervical injuries—with an endotracheal tube, and this gets the patient over the first 48 hours. If it is a dorsal or a lumbar injury, by that time you may not need triggered respiration and you certainly shouldn't need a tracheostomy.

With regard to chest injuries, to say that a tracheostomy is life-saving is a cliché. It is life-saving, but it carries the risks that Dr. Frankel has pointed out—if you remember his picture of the blown-up man, which we call the 'puff ball man', this is all too common. That is just a small and not a serious side effect. The other thing I would like to say is that, in intermittent positive pressure, ventilation through any machine your anaesthetist is familiar with, and, apart from cervical injuries, will tide the patient over the first 48 hours.

As regards abdominal injuries, there are two small points—one Dr. Meinecke mentioned—absence of bowel sounds. Well, of course, absence of bowel sounds for 48 hours, for two or three days shouldn't worry anybody, as indeed he pointed out. The second thing was not to be tracked by abdominal rigidity associated with say a mid-lumbar lesion. Time and time again, people have thought a paraplegic patient with abdominal rigidity has an intra-abdominal lesion and have opened him. Peritoneoscopy might solve a great deal of this problem.

Meinecke, F. (Germany). May I make some remarks to the osteosynthesis? We have seen several cases today. The aim and the goal of the osteosynthesis is to prevent pressure sores, to prevent stiffness of the joints and to prevent contractures, and we can reach this goal by stabilising the bone so that we can move them as soon as possible. That means, if you are doing an osteosynthesis you must afterwards have the bone absolutely stable for exercises, not for walking but for exercises, so that you can begin

with mobilisation immediately after the operation. The same applies to the turning treatment for the patient—you can do it. For this reason, it is not worth having wire traction anywhere because you cannot turn the patient and there is the danger of infection. Screws and nails or screws and wires are dangerous because of the development of erosion of the bone. One word about the hypertrophic callus—that is what we want to avoid, we do not like excessive callus after a fracture. And a last word, perhaps, to the blood transfusion; we use blood transfusions, and one cannot avoid this in the emergency cases, but on the other hand one has to remember that hepatitis has been increasing in the last years. We know that from the burns. We have after treating the patient with plasmas and blood transfusion 30 to 40 per cent. of hepatitis and from them 30 to 40 per cent. dying after chronic hepatitis.

Dr. Young (U.S.A.). For completeness, I would like to report two other sources of fluid in the chest and to emphasise Dr. Silver's plea that we continue to take X-rays. These occur in mid-dorsal lesions, particularly those that have wide lateral displacements. We have had three such cases, where the patient became gradually dyspnoeic, we took X-rays, the chest was full of fluid, we tapped it, the laboratory reported in two that we had a chest full of the contents from the thoracic duct. In the third, the laboratory found that the fluid was cerebro spinal fluid. We tapped these and drained off the fluid, and fortunately they are rare enough, and while we were standing around waiting for something brilliant to do they closed off and we had no more trouble with them; only aspiration was necessary.

Sir Ludwig (England). I think the papers and discussion on associated injuries in traumatic paraplegia and tetraplegia have given us a lot to think about and I am particularly glad that this very difficult problem has been one of the main subjects of this annual conference. The combination of head injuries and high spinal cord injuries is an important complication, and in this connection Dr. Hardy's comments can be endorsed by all of us. Mention has been made by Mr. Harris of vascular changes in the cervical area following spinal injury which may lead to brain stem lesions afterwards. I think this is absolutely correct. We have ourselves had such cases—and one particularly dramatic case, who came to us from Panama after gunshot injury of the high cervical area. He came in with a raised temperature and within two or three days he had a temperature of 108°. He became unconscious. Fortunately, Dr. Walsh and I happened to be in his room when he had an epileptic fit and pulse and respiration stopped. We were able to revive him but he remained more or less unconscious for over one week, then he recovered gradually. There was no question, he had sustained a vascular catastrophe in the brain stem with all the classical symptoms, particularly involving the speech. But even in these cases, we should not be too pessimistic as they may recover. The patient I have in mind is now back in Panama, is a Member of the Parliament, although his speech is still rather disturbed, and in spite of a severe, although incomplete, tetraplegia.

Unilateral and, in particular, bilateral paralysis of the diaphragm is always a most serious complication as mentioned by Dr. Frankel and Dr. Hardy, especially in cervical lesions, and immediate tracheostomy is a life-saving measure in this condition.