The author feels certain that paraplegics are best served by being treated completely in a special unit of a general hospital. This special unit should be able to call for assistance from outside rehabilitative units. It is not in the best interests of paraplegics that their early care in the first five or six months should be undertaken in non-specialised units such as orthopaedic, neurosurgical, urological, rehabilitative, or medical, for they cannot receive the especially co-ordinated service that, in many parts of the world, has been proved to give the best results.

THE FUTURE

So much for the present—what will the future hold? The author believes that the following will be needed in the years to come:

1. In Western Australia a full-time medical director will undoubtedly be required for the spinal injuries service.
2. The management of spinal injuries in Australia should ultimately become an independent speciality.
3. The need for wider research facilities must be met, particularly with regard to bladder physiology.
4. The scope of social work will have to be considerably expanded.
5. A steady improvement in the management of spinal injuries to the point where complications virtually disappear.
6. An even more adequate rehabilitation of quadriplegics than at present.
7. Finally, of great importance, more determined efforts must be made towards the prevention of spinal injuries. This can be undertaken with the co-operation of Road Safety Councils, Health Councils, etc., and must become an important part of the overall care.

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FIFTEEN YEARS' EXPERIENCE ON REHABILITATION OF PARAPLEGICS AT THE REHABILITATION INSTITUTE OF WARSAW UNIVERSITY, POLAND

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IN 1949 in Konstancin, near Warsaw, a Centre for Rehabilitation of Paraplegics has been created within the Institute for Rehabilitation, starting at that time with

20 beds. This Centre took care of all paraplegics who were transferred from other hospitals suffering from serious complications of their musculo skeletal, skin and urinary systems, hitherto typical to this condition.

The programme of rehabilitation was concerned mainly with the treatment of bedsores, working out urological automatisms and also developing maximum possible dexterity. Owing to the orthopaedic approach of the whole Institute in the beginning, the idea was winding its way through surgical reconstruction of bedsores, peripheral operations for spasticity, and also frequent re-interventions on the spine, in cases when a 'block' was diagnosed radiologically and neurologically. The gradual development of the Rehabilitation Institute as part of the Warsaw University resulted in growing demands, especially as regards treatment of paraplegics. At that time much attention was also called to the activation of other regions of Poland in the subject of paraplegics—accordingly a similar Rehabilitation Department for paraplegics was set up at the Neuro-Surgical and the Orthopaedic Clinic in Poznan. Taking advantage of the good climatic conditions at Konstancin, the paraplegics were spending the whole of the year on terraces, making use of sun and air bathing.

The principle of regular manual turning was applied as a basic essential in treating paraplegic patients. During this period also pneumatic mattresses, type Droeger and others, and also rotating beds were tested. However, we came to the conclusion that the best results in our Centre could be obtained by manual turning of the patient at regular intervals.

With regard to the management of the paralysed bladder, we applied very early, since 1952, the experiences of the Guttmann School, accepting as a rule in all non-infected cases the intermittent catheterisation, and with regard to plastic surgery of pressure sores, the resection of tuber ischii, trochanter major and rotation flaps.

The development of the Konstancin Rehabilitation Institure made it possible to increase the facilities for paraplegics by two more units, one for paraplegic children containing 20 beds and the other for acute paraplegia containing 35 beds. Thus there came into existence three separate departments which are now dealing with the rehabilitation of paraplegics.

In the following, a summary is given of the results of the organisational and clinical work of the department, and also on the main subjects of research.

CLINICAL MATERIAL

The clinical material in the course of 15 years comprises 786 paraplegics who passed through our rehabilitation programme. From all our experience it can be said that the best results obtained have been with paraplegic children, as in most cases we have succeeded in restoring the children to their full ambulation, and even in some cases of tetraplegia the return of the patients to active school-life. The worst results obtained from the social point of view were adult tetraplegics, especially elderly farmers. The social conditions of the Polish farmers, basically working on individual farms, make it practically impossible to rehabilitate industrially tetraplegic farmers. On the other hand, the facilities in towns, especially in greater towns, made it possible to provide paraplegics, after their return home, with suitable living conditions and employment with the help, in

particular, of the Co-operative Society for Invalids and Sheltered Work. We obtained for 50 paraplegics full professional training in watchmaking and creating their own private watchmaking shops. Paraplegics with distal lesions, restored to locomotion, were admitted in the early periods, from three to nine months after the accident, to special professional schools, where they were trained for the following occupations:

(*a*) medical laboratory assistants;
(*b*) radio technicians and television technicians;
(*c*) precision mechanics.

As a result of the great development of the Invalid Co-operative Society in the whole country, also those who did not obtain any occupation, or could not continue their previous job because of locomotion difficulties, could also be restored to active occupation life.

Field research on a material of 50 paraplegics, who were visited in their homes by a psychologist, a urologist and a social assistant, has shown that under the conditions of life in Poland a real satisfactory possibility for rehabilitation could exist only when the enterprise for sheltered work had at its disposal a hostel for paralysed workers.

ORGANISATION PRINCIPLES OF THE REHABILITATION DEPARTMENT

Based on our experience that in most of the cases admitted to us from other hospitals the treatment of their complications took three to nine months, we came to the conclusion that a unit of acute paraplegia must be organised at all cost. Accordingly, by a Decree of the Ministry of Health and the General Management of Hospitals in Warsaw, three years ago a unit of acute paraplegia has been created. None of the surgical hospitals is allowed to admit paraplegics, and all these patients have to be concentrated at the Konstancin Hospital. The creation of similar centres is being suggested to other regions and universities of the country, ensuring from the time of their organisation a consultation by air with the Metropolitan Rehabilitation Centre in Konstancin.

Apart from acute cases, beds were reserved for cases with complications admitted to us from other hospitals in the country. As a rule, we insist in such cases that the doctor in charge of such a case should stay in our Institute for at least six weeks to receive an appropriate training. Thus we are able to show on his own case the proper management.

The unit of paraplegia with complications is situated in a separate building designated for septic patients; it is managed by an orthopaedic surgeon who had received an additional training in plastic surgery. As consultants a urologist and a neurologist are available.

The unit of acute paraplegia is being managed by a neurosurgeon with an orthopaedic surgeon and a urologist as consultants.

The unit of paraplegic children, although separated in regard of organisation, is integrated with the children's department, thus the paraplegic children are able to participate in all school activities, without special separation.

When notification of a case of acute paraplegia or tetraplegia is received,

there are two possibilities of ensuring speedy transport: the first is the despatch of a sanitary plane or helicopter of the Sanitary Ambulance Service; the second, in case transport by the above-mentioned service is not possible, to contact the unit of the Polish Airforce. There exists always the possibility of using a helicopter or a swift military plane to transfer the paraplegic patient to the airport. The military surgeon who is attached to the transport has been trained in the technique of transporting paraplegics or tetraplegics. Appropriate letters and instructions have been despatched to all stations of the Air Emergency Service. The patient arrives at Konstancin mainly by helicopter, landing in the vicinity of the Centre.

The department of acute paraplegia has its own unit of intensive therapy. He passes from the intensive therapy unit to rooms for ambulant patients in which the patient uses orthopaedic devices and walking aids. After his condition has improved—he is transferred to a room, conventionally furnished, where he is being prepared for leaving the Centre.

The department of children paraplegia and the department of the septic complicated paraplegia are conducted in the conventional way, applying to the children the principle of the most speedy weight-bearing, and taking part in the normal school-life and social activities of the whole department. As regards septic paraplegia, the traditions of the previous years are applied, which consist in making use of the climatic conditions of Konstancin and the organisation of the hospital among trees.

The department of paraplegia has attained scientific results of its own which can be subdivided into:

1. **Systematic Work.** Isometric and isotonic training with the view to developing compensatory mechanisms of the upper extremities.
2. **Studies on Thermo and Vascular Reaction of the Skin** during intensive training for sport competitions; furthermore on technical appliances essential for the rehabilitation of paraplegics in conditions prevailing in Poland, especially with regard to the construction of a Polish-type wheelchair.
3. **Studies on the Spinal Cord Regeneration,** especially with regard to symptoms of spasticity.

A Scientific Session took place last year in Konstancin, where we displayed our own research results on spastics and also compared our research with those of other Polish and foreign schools. Taking advantage of the clinical material admitted in the acute stage, we are conducting research on the spinal shock, with special reference to Hoffman reflex.

PSYCHOLOGICAL AND PSYCHIATRIC RESEARCH

Papers discussing the possibility of orthopaedic reconstruction, of plastic surgery, and also some aspects of the urological surgery by paraplegics have been published.

DEVELOPMENT PROGRAMME

Taking into account the undoubtedly growing problem of paraplegia, and also the necessity of promoting the idea of organising more spinal units at

FIG. 1

FIG. 2

Figs. 1 and 2 show the easy access for paraplegics from the Spinal Centre to the sports facilities of the Rehabilitation Institute. Special arrangements have been made for wheelchair basketball (in the foreground of Fig. 2) and archery (in the background of Fig. 2).

university hospitals and also at greater municipal hospitals, there is in progress an action of schooling and demonstrating. To these lectures the physicians at the university and municipal hospitals and also the directors of the Public Health Services of the various regions are invited. In the near future there will come into existence in Poland some new rehabilitation units with paraplegia rehabilitation units, first of all in Silesia, Gdansk and Poznan. A sport section of paraplegics has been created at the sports club of the Invalid Co-operative Society. In the near future the start of the building of an establishment is expected comprising living-rooms connected with the Invalid Co-operative Societies.

Comprehensive research work is planned, the aim of which is primarily the activation of the medical treatment programme, shortening the duration of rehabilitation and speeding up the evaluation of the social prognosis. In view of the living conditions in Poland, in cases of young people coming from villages there is a need to change their living conditions, especially their homes and to create appropriate economic groups, connected with the Invalid Co-operatives. To this purpose the necessary means are being prepared by the Invalid Co-operatives so that in the near future colonies will be organised in greater district towns.

Research on orthopaedic devices, especially for use by tetraplegics, will be started in the not too distant future with a view to inserting electrodes in the region of peripheral nerves and stimulating muscles. We are convinced that cross-skin electro-stimulation with the possibility of eliciting appropriate movements will show new ways leading to a combination of electronics with suitable mechanical or pneumatic devices. Co-operation has been initiated with the Institute of Automatics at the Polish Academy of Science and with the Chairs of Automatics of the Technical High School of Warsaw University.

Work on wheelchairs for paraplegics allows us to hope that this programme will be solved in the near future. We received for clinical use universal wheelchairs adapted for difficult terrain and also for taking part in sport proper to paraplegics.

For the third time a Polish team has come to the International Stoke Mandeville Games. This year our team is much bigger than in the previous years, and also includes women. Our team has been trained for the competition in the Warsaw Olympic Centre, together with normal sportsmen. This is a sign of great understanding in Poland of sport for the handicapped as an essential part of their social rehabilitation.

ORGANISATION OF A SPINAL INJURY UNIT WITHIN A REHABILITATION CENTRE

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THIS problem and others regarding the disabled were studied in Ireland by the Minister's advisory body—the National Organisation for Rehabilitation (N.O.R.).