Two villous tumours have also been investigated by the Brünig's forceps. Clinically they were very different. One was a soft sessile mass seen at 15 cm. from the anus; the sections indicated a simple villous tumour. The other was a soft friable mass in the lower rectum of a young man, with a massive submucous infiltration extending up the wall of the rectum; clinically, an infiltrating malignant tumour seemed inevitable, and this was proved to be the case on laparotomy, when massive deposits of colloid carcinoma were found in the great omentum and were proved microscopically. The sections of the primary tumour removed by means of this forceps from its surface do not clearly prove its malignancy: this case indicates some of the difficulties and fallacies involved in an attempt to assess the malignancy of a rectal growth by this method—the surface appearance may be different from the condition at its base.

My routine practice now in my out-patient clinics at St. Mark's Hospital is to take pieces for section from every new case of rectal cancer, so that by the time the patient is admitted to the wards the written report on the section is available for inclusion in the in-patient notes, and the

diagnosis is established whatever the subsequent line of treatment may be.

SUMMARY

The method described is effective in enabling a histological diagnosis to be made for cancers of the rectum that can be seen through a sigmoidoscope. The pieces for section are taken from the edge of a malignant ulcer or from the surface of a nodular or fungating growth. It is not suggested that this method will be of assistance in determining the malignancy or otherwise of a simple tumour, such as an adenoma or papilloma, which may be suspected of having undergone malignant change.

I must acknowledge my indebtedness to Dr. R. Bensaude, in whose rectal clinic at the Hôpital St. Antoine, Paris, I first saw the forceps used as described above; to my colleague Dr. Cuthbert Dukes, pathologist to St. Mark's Hospital, for his interest in these cases; and to my surgical colleague Mr. L. E. C. Norbury, for permitting me to refer to his remarkable case.

REFERENCES

- ¹ Rankin, F. W.: *Surg., Gynecol. and Obstet.*, 1929, xlix, 193.
- ² Norbury, L. E. C.: *Proc. Roy. Soc. Med.*, Subsection of Proctology, 1922-23, 67.

A METHOD OF EXCITING INCIPIENT MOVEMENT IN WEAKENED AND PARALYSED MUSCLES

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Though differing widely in their pathology, fractures, cases of anterior poliomyelitis and of spastic paralysis present certain difficulties in the early treatment for restoration of function which are much diminished by the application of the principle of giving exercises by the use of unopposed movements—movements of a type much easier than usually described in textbooks, and based on the idea of primary relaxation.

The restitution of movements in a fractured limb, and the muscular re-education necessary to restore voluntary movement to a paralysed group of muscles, present great problems, because of the many mechanical and physical factors which militate against recovery in the earliest stages. The incipient return of power remains concealed for a time, until it reaches such a magnitude that it is capable of overcoming that resistance which may be opposed to it. Until then neither the patient nor the medical gymnast is aware that any recovery has taken place.

The methods described here, which have been used very successfully in the massage department of St. Mary's Hospital for the last six years, aim at eliminating all checks to the activity of the weakened muscles by counterbalancing the weight of the limb, inducing a relaxation of the opponent muscles, and finally counteracting almost entirely inertia, friction, and gravity. This allows the feeble minimal efforts of the affected muscles to act, not in the stationary limb, but in association with pendulum movements, maintained by the operator at first and later by the patient. The apparatus necessary for this purpose is an overhead bar with ball-bearing pulleys, through which run adjustable ropes and slings (Fig. D). By this means the faintest return of power is allowed free play, the activity of the muscle contributes to its more rapid recovery, and the patient, persuaded by the wide range of movement into thinking that he

is accomplishing more than is actually the case, is encouraged to exert every effort without the usual fear of pain, thereby hastening restoration to normal function.

APPLICATION TO RECENT FRACTURES

As complete relaxation as possible must be attained. This is practicable only if the patient's mental attitude is free from anxiety and the fear of sudden movements,

FIG. A.—Showing a fracture of the humerus put up in adduction, and having exercises in the antero-posterior plane of movement.

or movements beyond the range of his capacity. Jerky or irregular movements, or those not evenly graduated in force, will cause pain and spasm beyond voluntary control.

The limb is hung by adjustable slings from a horizontal bar, and is then gently swayed up and down, from side to side, or back and forward as the particular case demands, all opposing forces being counterbalanced as exactly as possible (Fig. A). Perfect support can thus

be obtained; the weight of the limb is almost entirely transferred to the apparatus, and the adjoining joints are stabilized by the mechanical support instead of muscle activity. The muscles, therefore, can perform their lever movements more easily, the action being so smooth, and having such regular rhythm, that nervous tension and fear will disappear, and a good range of voluntary movement should soon be obtained. This later stage is begun by encouraging the patient to join in with the pendulum movement initiated by the operator, and is greatly assisted by making the sound limb perform similar movements, thus giving a double-sided movement with use of further slings, inducing a sense of co-operation, rhythm, and balance.

FIG. B.—Showing a fracture of the surgical neck of the humerus, for example, put up in abduction with splint adjusted to allow movement on slings.

POLIOMYELITIS

The fact that the limb is relieved of its weight before any movement is attempted, and mechanically assisted against the opposing forces of gravity and friction, will allow the minimum muscular effort to produce a maximum effect.

Figures C and D show the position of a patient ready to exercise a paralysed deltoid in recumbent position.

As the arm swings to and from the body, the rhythm is taken up by the muscles, and the deltoid action is timed to take place at the most advantageous moment, so that its tiny contractions produce a movement and shortening of its muscle fibres instead of straining against forces too great for it to overcome; in fact, the movement is very much akin to floating on water, and might be termed a "dry water treatment." It is obvious that risk of fatigue is thus greatly eliminated; should the operator desire to restrict the range of movement, he should limit it to, say, 30 degrees by checking the movement by hand. As the muscle begins to recover, the idea of purposeful movements should be introduced (such as hitting the elbow against a tambourine at the point of maximum abduction required), and also calling a volitional "halt" during the swing of the limb.

These methods will obviate the danger of a purely mechanical swing, which, although of undoubted advantage in early cases, is monotonous and too easy to perform where partial recovery has occurred.

FIG. C.—Showing a later stage in the treatment, when abduction movements are begun in a recumbent position.

FIG. D.—Illustrating a position which can be used to get the double-sided effect mentioned above.

Again, the advantages resulting from the co-ordinated use of sound and affected limb cannot be overstressed, as Figure D shows.

Spastic Paralysis

In these cases the slinging method, by removing some extraneous sources from which stimuli productive of spasm may be derived, allows a development of power and movement in the over-stretched opponents of the contracted muscles; it reduces the tension in the latter (contracted) muscular group to a minimum; in this particular connexion, perhaps the most important of all, it induces a condition of mental repose and the development of a "plastic mind," both highly beneficial to the patient's general condition and also conducive to the production of a regular and rhythmic type of movement. Figure D illustrates the general relaxation position.

CONCLUSIONS

1. The relaxation treatment encourages a mental and a local physical condition conducive to the restoration of normal function in the affected part by instilling into the patient the necessity and ability to rest the central cerebral processes and to develop a "plastic mind."
2. The possibility of producing a maximal movement with a minimal muscle effort lessens the risk of fatigue in a weakened muscle group.
3. The removal of extraneous forces, in particular, gravity, the weight of the limb, and friction, leads to the abolition of fear, with its concomitant involuntary spasm, and to the growth of confidence, with consequent ability to assist voluntarily the restoration processes.

A SAFE METHOD OF DEALING WITH ETHMOIDITIS *

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The dangers of ethmoidal operations are considerable, and are often due to extension of the infection along the perineural sheath of the olfactory nerves or damage to the cribriform plate. There are also the dangers due to an accompanying sinus suppuration. Infection of the frontal sinus, however, gives an indication of its existence by the locality of the pain, and sphenoidal empyema may also be present, a disease dangerous in its closed form and characterized by most indefinite symptoms. Bacteria in the sphenoidal cavity have the power of passing through bone or infecting the meningeal network by some inconstant route.

I would urge that in all cases of ethmoiditis, except simple polypus, radiograms should be taken to obtain information as to the infection of the sinuses, and, if the radiogram is doubtful, that the particular sinus should be drained by the intranasal method. Radiographic pictures of the frontal sinus are usually definite; the evidence of infection of the maxillary antrum is less clear, and that of empyema of the sphenoidal sinus is extremely indefinite. I suggest that primary ethmoiditis operations should, except for simple polypus, consist in removal of the middle turbinal bone with intranasal drainage of the sphenoidal and the maxillary antra. The frontal sinus should be dealt with at the same time by intranasal or external operation if the radiograms and symptoms indicate infection. I am in touch with a patient in whom all six sinuses were opened for early ethmoiditis ten years ago; pus was present in one sphenoidal sinus and in the frontal sinus of the other side. The ethmoiditis has completely subsided.

The middle turbinal varies very much in structure. In some cases it consists of a lamina, but in others it contains a small or expanded middle ethmoidal cell causing pressure symptoms on the septum when the cell is expanded. It is possible that this pressure when combined with rhinitis may be a factor, for it is this cell type of middle turbinal which undergoes polypoid change; and though the supporters of the "from within theory" may be assisted by some special character of the bone itself, it would appear that it is only in the case of thin laminae of bone, in which periosteum and mucous membrane are closely combined, that inflammation of the mucous membrane leads to osteitis, constituting ethmoiditis. The degree varies from the local change resulting in simple polypus to the common condition of rarefying osteitis with polypi and a varying amount of pus to the extensive form occasionally seen in fevers of acute infection with disintegration of the ethmoid into granulation and pus. Under these conditions the inferior turbinal, consisting of spongy bone, develops hypertrophic rhinitis, and I have seen a middle turbinal of structure similar to an inferior turbinal which merely developed a hypertrophic rhinitis like that of the inferior turbinal.

Removal of Turbinal Bones

Removal of the middle turbinal by Luc's forceps should be carried out either in its entirety by gripping the body of the bone, or by "nibbling" from the anterior end and removing the opened cell. In this way the landmark of attachment of the turbinal is preserved with a view to the opening of cells in the fronto-nasal and agger nasi regions situated at the anterior attachment of the middle turbinal; these are easily opened by the gouge and mallet. It is, as a rule, necessary only to carry out occasional trimmings of polypi under a local anaesthetic from time to time, and to open cells only if the symptoms of discomfort due to closed empyemata appear. Extensive opening of these cells is rarely indicated. Sir StClair Thomson mentions that the opening of the higher cells is fraught with danger. Even removal of the middle turbinal may be a danger.

A man, aged 38, suffered from nasal obstruction. Both the radiogram and the symptoms showed frontal sinus infection. The nasal cavities were filled with oedematous polypi, a small amount of muco-pus being present. A softened middle turbinal was removed from either side and the antrum was opened. On the second day he complained of a severe headache, and died of meningitis. On one side the cribriform plate showed a small erosion from which the softened mucous membrane came away, probably with the turbinal.

This condition would possibly have been fatal in any case, and certainly in any extensive ethmoid removal.

Frontal Sinus

It is rarely necessary to drain this without radiographic or symptomatic indications; if such exist, an intranasal operation should preferably be carried out, special attention being directed to the fronto-nasal and agger nasi cells (anterior ethmoidal group) by applying gouge and mallet to the part immediately anterior to the attachment of the middle turbinal. (This should be done before removal of the middle turbinal.) Infection of these cells is closely interwoven with latent frontal sinusitis, and even with that variety in which the pain is removed by the application of a pledget of wool soaked in 10 per cent. cocaine solution. The maxillary antrum should be drained intranasally in most cases of extensive polypi, an opening being made by Tilley's frontal sinus burr; the aperture can then be enlarged by Luc's forceps. It is usually advisable to remove the anterior end of the inferior

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