Nerve Transplantation.

Conditions in which this method would seem to be indicated may be summed up in general terms as follows:

1. Where the distance to be bridged is relatively short.
2. Where no suitable or neighbouring nerve is available.
3. Where the affected nerve is of considerably less importance than the nerve to which it would have to be anastomosed.
4. Where, as in the case of the musculo-spiral, a suitable nerve for an autogenous graft (for example, the radial) is conveniently obtained.
5. Where a suitable homogenous graft is available.
6. Where the bed in which the graft will lie is composed of tissues favourable to the survival of the graft, which will not then run the risk of being strangled by fibrous tissue around it.

The nerves most favourable for use as autogenous grafts are the radial and the external cutaneous of the thigh.

Nerve Anastomosis.

On general grounds this procedure would seem to be indicated:

1. Where the distance to be bridged exceeds three inches.
2. Where a neighbouring nerve of considerably less importance and suitable size is available.
3. Where, if a graft were used, it would have to lie in a mass of already present scar tissue.

The varieties of anastomosis methods that are recommended are as follows:

1. *Partial Peripheral Anastomosis.*—The healthy though degenerated distal end of the affected nerve is inserted into a longitudinal slit in the sound nerve, if the nerves be small ones; if the nerves be large, the distal end of the affected nerve is sutured to a flap raised from the sound nerve at a point as far as possible proximal to the point of origin of any important branch.

2. *Implantation of both central and peripheral ends* of the affected nerve into longitudinal slits of the sound nerve may be advisable where the latter is chiefly or wholly sensory.

3. *Complete peripheral anastomosis* between the central end of the sound nerve, which is cut for the purpose, and the distal end of the affected nerve is justifiable only in very exceptional cases. Such a case was one in which the median nerve was destroyed from just above the wrist right up to the elbow. Inasmuch as the ulnar nerve in the hand—at any rate from the motor point of view—is a very much more important nerve than the median, it was not thought advisable to perform an anastomosis with it; but the radial was cut low down in the forearm and sutured to the distal end of the median. Of course, in this case all hope of recovery of power in those muscles of the hand supplied by the median was abandoned.

In the rare event of an ununited fracture of the bone of the limb segment being present with an extensive destruction of a nerve, shortening of the limb by resection of the bone would seem to be quite a justifiable procedure.

2. THE PREVENTION OF FIBROUS INGROWTH.

The necessity for the use of some wrapping material is still *sub judice*; on theoretical grounds at any rate it seems desirable. That Cargile membrane does not by the end of three weeks contract adhesions or absorb is proved by a recent case. At the first operation the writer removed an aneurysm of the third part of the axillary artery, an extensive lesion of the musculo-spiral nerve being found. It was found impossible to unite the ends, and strands of catgut were inserted, and they, with the divided ends, surrounded by membrane. Three weeks later the nerve was again operated upon, grafts of the radial and external cutaneous nerves being inserted; the Cargile membrane was found as it had been inserted.

The substances most frequently used for wrapping are Cargile membrane, hardened arterial tubes, segments of the internal saphenous or other large vein, and pieces of fascia lata and adipose tissue.

Some French surgeons, however, have recently been painting the nerves with sterilized olive oil in order to prevent fibrous ingrowth and the formation of dangerous adhesions.

OPERATIVE TREATMENT IN HOPELESS CASES.

Amputation.

The presence and recognition of injury to one or more nerves in a badly smashed limb may be the deciding factor in a decision to amputate.

Apart from such cases, however, one may be forced to amputate on direct account of the nerve injury:

1. Where after operation on the great sciatic nerve the sensory recovery does not get beyond the stage of recovery of protopathic sensibility with intense hyperalgesia.
2. Where recovery after operation on the nerves of the lower extremity does not include return of protopathic sensibility in the sole of the foot, and trophic sores and perforating ulcers cause trouble.

In hopeless cases or where motor recovery has not occurred, such operations as *muscle transplantation*, *arthrodesis*, and *insertion of artificial silk ligaments*, which have a recognized place in the treatment of infantile paralysis, may be performed with great advantage to the patient.

A CASE OF ENTEROSPASM IN WHICH THE PORTION OF INTESTINE INVOLVED WAS OF UNUSUAL EXTENT.

BY

C. HAMILTON WHITEFORD, M.R.C.S., L.R.C.P.

H. P. HAWKINS, in his comprehensive article on enterospasm,¹ says:

Without any change in the intestinal wall, one or more sections of the intestine may exhibit a purposeless tetanic contraction. It is thereby converted into a hard, nearly solid, cord, pale and bloodless.

The second case of Hawkins's series presented symptoms almost identical with those of the case here recorded.

A woman, aged 49 years, wife of a shipwright pensioner and mother of two grown-up children, for thirty years suffered from "indigestion," with vomiting on an average once a week; nine years ago the discomfort increased to actual pain, which occurred soon after ingestion of food, milk causing less pain than solid food. The vomiting gradually became more frequent. During the last five years she had had many family worries.

Condition when First Seen.

She was thin, with only a quarter of an inch of abdominal subcutaneous fat, and stated that four years ago she was quite plump. Vomiting was occurring once daily, usually after breakfast. The vomit had never contained blood. Constipation, with flatulence had existed for many years.

The only abnormality observed in the abdomen was a tender, ill-defined fullness situated between the umbilicus and the left costal margin. This tender area was constant. Nothing was observed on rectal and vaginal examination except a mobile retroverted uterus with an elongated cervix. A pessary had been worn for twenty years. Treatment by diet and drugs had given very little relief; the patient, neurasthenic, but not in the least hysterical, and of remarkable intelligence, willingly accepted an exploratory coeliotomy, fully appreciating the uncertainty of the benefits which operation might afford.

Operation.

Coeliotomy demonstrated that the stomach was enormously distended by gas, measuring in its greatest circumference 14 in., and that the duodenum was uniformly distended by gas (diameter 1½ in.). The small intestine was traced downwards for its whole length. The upper 3 ft. of jejunum were distended by gas to the size of the duodenum. Three feet from the duodenum the jejunum became abruptly narrowed, being in a state of intense contraction. The next 3 ft. of jejunum were uniformly contracted into a rugose, anaemic cord half an inch in diameter. Below the spastic area the rest of the small intestine was normal, as was the large bowel.

The other viscera showed no abnormality except undue mobility. Absence of fat was marked, the gastro-colic omentum being diaphanous. The head of the pancreas was so loosely attached that it, together with nearly the whole length of the duodenum, was easily lifted above the level of the abdominal skin. The abdomen was closed.

After-Course.

At the time of writing, a month after operation, the patient is taking ordinary food and does not vomit; the bowels act daily under paraffin and drachm doses of liquorice powder. Such post-operative improvement, with attention to the bowels and rest in bed, appears to be of common occurrence, but, unfortunately, is apt to be only temporary.

I have seen at operation a number of cases in which the small intestine was either found in, or quickly passed into, a

state of tetanic contraction, but in all these the bowel was involved only for a few inches. Sometimes the contracted area, on being bathed with hot saline solution, was seen to relax and assume a normal appearance. No such observation was permissible in the above case, the manipulations having produced a marked degree of shock.

In regard to the action of belladonna as an antispasmodic, the patient, who was anaesthetized with ethyl chloride followed by open ether, had received one hour prior to operation a hypodermic injection of atropine $\frac{1}{2}$ grain. Enterospasm may simulate almost any intra-abdominal lesion, either chronic or acute, and is one explanation of cases which appear to be some variety of the "acute abdomen" but in which operation shows nothing abnormal, the surgeon not always being so fortunate as to catch the intestine in a state of spasm.

James Swain² has recorded a case resembling acute obstruction in which only spastic intestine was found; also a case resembling perforation of a gastric ulcer in which operation showed no cause for the symptoms. This last patient had previously undergone gastro-enterostomy, nephropexy, and removal of the appendix. In cases resembling an infective lesion the absence of an increase in the number of the leucocytes is a useful aid to diagnosis.

Mimicry by enterospasm of chronic abdominal affections is not uncommon. I have another patient, a medical man, aged 49, who has for ten years suffered from attacks of abdominal discomfort, sometimes aggravated into acute pain. He is mildly neurasthenic, and the attacks follow periods of excessive work or undue worry. They have at different times suggested chronic cholecystitis and a colonic growth, but nothing definite has ever been demonstrable, and the patient not unnaturally declines operation. In this case the spasm sometimes involves the rectum and perineum, the patient being awakened in the early hours of the morning by an intense sacro-rectal pain, which is relieved by firm pressure made on the perineum, and terminates with expulsion of flatus.

Among Hawkins's observations are the following:

There is much abdominal pain which has no name and does not kill.

Such patients may be intelligent and industrious, but they are none the less emotional. They are neurasthenic in the sense that the nervous power is rapidly exhausted by exertion of body or mind, and is but slowly restored.

The abdominal trouble varies directly with the mental state.

In nearly all of these cases some part of the colon can be felt as a hard cord about the size of a man's forefinger. This is more common in the left iliac fossa than elsewhere.

But it is well to remember that in patients with no symptoms of enterospasm it is usually easy, provided they are thin; to palpate the iliac colon as a rounded cord. Enterospasm frequently simulates chronic appendicitis, and Hawkins, after quoting eleven cases in which removal of the appendix caused no improvement, says:

It would be a gain if only it were generally allowed that not all pain in the right side is due to disease of the appendix, but may have such a comparatively harmless nature as is here suggested.

He concludes:

There is no disguising the fact that patients exist whose intelligence is of such an order that, if suspicion has once been cast upon the state of their appendix, they will not rest satisfied until it is excised. Finally, in cases in which the pain is probably of the functional kind and yet the possibility of appendix disease cannot be excluded, it is certainly helpful to the physician if the appendix has already been removed. On carrying out his course of treatment, he can then act more freely than if a doubtful appendix were still present.

Tissues which are diseased frequently need removal, but that asthenia, whether it be of the patient's intellect or of the physician's efforts, should be treated by ablation of organs not obviously abnormal, is a proposition which I am unable to accept.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, January 13th, 1906, p. 65. ² Ibid., June 22nd, 1912, p. 1412.

THE University of Lausanne recently celebrated the twenty-fifth anniversary of its foundation. Among those upon whom honorary degrees were conferred on the occasion was Dr. Rollier, who has taken a leading part in the introduction of the sun cure for tuberculous diseases of bone in Switzerland.

PRACTICAL METHODS OF ANAESTHESIA.*

BY

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THE word "practical" in this paper means:

1. That the anaesthetic should be suited to the patient, to be modified or changed entirely if indicated.

2. That the induction should be pleasant to the patient, respiration, blood pressure, and colour reflex remaining normal.

3. That the maintenance of anaesthesia should vary with the requirements of the surgeon, at the same time keeping the patient's condition as nearly normal as possible.

4. That the transition from the anaesthetic stage should be as gradual and smooth as the induction, the patient emerging as from a quiet sleep, without pain, nausea, or conscious or unconscious vomiting.

All of these requirements are met by modern methods, not yet in general use by the excessively utilitarian surgeon who employs one method, administered by a nurse anaesthetist. Anaesthesia is a vital part of the practice of medicine. The adoption of any one method, and hence of any one anaesthetic, regardless of conditions, is contrary to the common sense that should govern all surgical procedures and the administration of all drugs. When a surgeon assumes the responsibility for the narcosis he becomes an anaesthetist. It is almost impossible for him to keep up with the literature of his own speciality; that he is not up to date on the subject of anaesthesia is proved by the type of anaesthesia witnessed in some of the best known clinics of to-day.

It is begging the question to say that the nurse anaesthetist is superior to the average interne. On the other hand, the professional anaesthetist must modify his point of view. A physician specializing in anaesthesia should have control of this department in every large hospital, in every medical college, and in every large teaching clinic. It is inexcusable to place nurses in absolute charge of anaesthesia in large teaching clinics.

The nurse anaesthetist has proved to be entirely "practical," according to some surgeons; but it is proposed to discuss the subject under the higher meaning of the word "practical," as briefly as possible.

Preliminary and Post operative Medication.

In order to forestall acidosis, the patient should be given sodium bicarbonate and lactose, one drachm of each, every four hours for at least forty-eight hours before the operation. If the urine is already acid the dose of sodium should be increased. Glucose, by the rectum, should be given after the operation (Buckler). Bonnot and Cleveland, of St. Louis, after using quinine salts in 600 cases, recommended quinine muriate, grains 10, dissolved in 2 ounces of water at 100° F., to be given immediately after operation, and to be followed in thirty minutes by saline proctoclysis, or in septic cases by six ounces of olive oil. The quinine is repeated every six hours for from four to six doses. It is stated that with this medication "back-ache is practically eliminated, and only about 2 per cent. suffer gas pains."

Preliminary narcotic medication is indicated in nearly every case. It should vary with the patient and with the individual anaesthetist. Without such preparation, a rise of blood pressure at the very thought of the operation, together with other changes from the normal, may prevent the smooth induction, the easy maintenance, and the uneventful recovery that would otherwise be obtained.

Instead of morphine, which sometimes in itself produces nausea, we prefer the following preliminary, which is modified to suit the individual case:

R

Paraldehyde }
Pot. bromid. } aa 3i-ij
Aqueae q.s. ad ʒiv

M. Sig.: With the patient in Sims's position give, per rectum, 40 to 90 minutes before operation.

It has been proved, in the laboratory, that with this medication: (1) Anaesthesia comes on more promptly and

* Read before the New York and New England Association of Railway Surgeons, New York, October, 1916.