nature of it. As soon as the bacteriologist reports a marked diminution in the number and character of the organisms present, and we find an almost complete absence of purulent discharge, the wound is closed. Bacteriological examination of the discharges is made from each dressing when it is removed, and I am indebted to Dr. Helen Clark, bacteriologist to the Northumberland War Hospital, for her valuable assistance and help in this matter.

In a previous paper on magnesium sulphate solution it was claimed that this dressing produced firm, compact granulations, and also that rapid epithelialization of the wound took place under it. There is no doubt that under the concentrated magnesium sulphate cream the granulations are not so vascular and firm as with the concentrated watery solution, and moreover are covered by a layer of lymph, and that the epithelium from the edges of the wound does not close in so rapidly. This is what would be expected in an application which has so powerful an influence in controlling sepsis. Abscesses, if opened by a small incision, their pus contents evacuated, and cavity mopped out with gauze, filled with magnesium sulphate cream, and closed by sutures, generally heal with one or two dressings. Wounds, however, especially those of long standing, that have become sluggish do heal up under it. As would be expected in the presence of a preparation whose main claim is the production of profuse lymph lavage, those wounds do best which have no dependent counter-opening and which can be filled with the cream.

Conclusions.

Magnesium sulphate cream presents the following advantages:

1. Simplicity of application and the rapidity with which large numbers of cases can be dealt with—as in field ambulances and casualty clearing stations.
2. The infrequency of dressings, which even in the most septic cases need no change from three to eight days.
3. The combined osmotic action and the inhibitory effect on the growth and development of such ordinary organisms as are usually found in wounds—aerobic and anaerobic—together with its non-toxic action on the patient, make this a valuable dressing in the first stage of wound treatment, where the aim is to get rid of sphacelated tissue and minimize sepsis.
4. Its sphere of action as a rule ceases after the first stage, because epithelialization is inhibited and granulation tissue formation delayed as soon as the wound has been cleansed.
5. In the second stage of wound healing, that is, the encouragement of repair, other remedies should be employed, though it is useful with chronic sinuses or wounds which require stimulating.

REFERENCES.

¹ *British Journal of Surgery*, 1915-16, p. 276; *Journal of the R.A.M.C.*, October, 1916.

POST-OPERATIVE THROMBOSIS AND EMBOLISM.

By CHARTERS J. SYMONDS, C.B., M.S.,
F.R.C.S.,

CONSULTING SURGEON, GUY'S HOSPITAL.

IN a discussion some years ago at the Royal Medical and Chirurgical Society, upon the complications following appendicectomy, I called attention to a possible cause of embolism, and suggested a remedy. In view of the interesting communication from Dr. McCann (March 9th, p. 277) it may be worth while to recall some of the observations.

All will agree with the sound conclusions as to technique enforced by Dr. McCann, and it is, I expect, to improvements in this regard rather than to any detail in ligature that the diminished incidence of the complication is to be attributed. Once sepsis has begun, its spread would be encouraged by bruised tissue, which is a soil favourable to the growth of bacteria. Herein lies, I take it, the truth of Dr. McCann's theory. Careless division of vessels, leaving parts poorly nourished, will determine extension of sepsis in an amputation, but in this, as in the special field alluded to by Dr. McCann, the primary step is a certain

degree of sepsis introduced at the operation. That this may be an auto-infection cannot be altogether denied, and the experiments on *bistournage** by Chevalier give support to Dr. McCann's views. It will be remembered that, while a mild illness occurred in rams inoculated but not injured, those in which the spermatic cord was twisted all had gangrene at the site of injury and all died.

It is only on such a basis that we can explain the many cases of local phlegmon, of all degrees of intensity; the acute periostitis in young people resulting from a slight injury; and the acute psoriasis following a strain. It is an injury that determines a joint infection in septicaemia. During this war acute suppuration of the knee has been seen to follow the manipulation required to deal with a septic compound fracture of the femur, and again of the ankle-joint under similar conditions. One of the most tragic cases coming under my notice was that of a surgeon who had scratched his finger while operating on a septic case. The injured part healed in two or three days, and he was apparently quite well and discharging his duties. He reached up to pluck a flower, and felt a "rick" in his "shoulder"—that is, vaguely; it might have been in one of the muscles. Four hours later he had a rigor, and an acute phlegmon developed in the pectoralis minor, from which he nearly died. This was a true replica of Chevalier's experiment.

If there be these acute auto-infections, so there are the milder varieties, and however perfect our technique may be, it must occasionally happen that we operate upon a patient in apparent health, yet in whom a septic infection of the blood is present. So long as the infective agent is within the endothelial-lined vessels the individual is protected, and the blood ultimately deals with and destroys the bacteria or neutralizes the products of bacterial life. Once this endothelial barrier is broken, as in the instance above related, by a rupture of muscle fibre, the infective agent escapes, and multiplies in the bruised tissue, the small blood clot, and the unprotected normal tissues. While we must be very careful in admitting such an explanation—one altogether too comfortable to the surgeon—we cannot exclude the possibility of such an occurrence. The practice adopted by many of having the patient in bed and under observation for a few days before operation is a wise precaution, and fully justified in the light of such events.

It remains to consider whether we can adopt any means of limiting the extension of the thrombosis. The disaster has occurred chiefly where primary union has taken place, and where none of the ordinary clinical evidence of sepsis has been manifest. It is, however, just in mild phlebitis that the detachable clot is formed. Where a vigorous sepsis occurs, with even double thrombosis and oedema of the legs, the clot is adherent and not likely to be detached. Looking back on the course of a case where uninterrupted recovery has followed, say, a simple appendicectomy, with no disturbance of temperature or pulse worth recording, small changes in the general condition of the patient will be recalled. There has not been the romping recovery, the subnormal temperature, the strong relish for food, the alert mental outlook one is accustomed to see. Small evidences of a disordered organism may be recalled, too slight to be recorded by the thermometer, or to affect a change in pulse rate. The pulse lacks tensor, the blood pressure is probably low, sleep is not sound and prolonged, the mind is easily tired, and other small departures from the normal can be recorded. Finally, the patient is moved to a sofa or sits up, and then the oedema of the foot and ankle is discovered. At one time I made it a rule to examine the upper part of the thigh, where oedema shows itself in the recumbent position, before allowing the patient to get up. More than once it has been present. It is well to do this when the slight symptoms mentioned are present in a case where the wound runs a normal course.

It is a common observation that post-operative pulmonary embolism is seen only in connexion with operations on the abdomen. The inguinal canal and scrotum, as well as the rectum, must be included in this region. After an operation for inguinal hernia in a lady, a severe embolic attack occurred, through which she struggled for twelve hours, with great dyspnoea, cardiac pain, and cyanosis. A second attack followed the next day, and from this she also recovered. After a radical cure for

* That is, sterilization by torsion of the spermatic cord.

hydrocele in a young man, there occurred the most severe attack I have seen ending by recovery. He was unconscious for several hours, with a flickering pulse and cyanosis. This patient had been about the ward for some days.

Has anyone seen a case occur after an operation above the diaphragm? Here much tissue is often included in the ligature, sepsis is common as in breast cases, and is inevitable in operations for removal of the tongue. Nor has the complication, I believe, been recorded in children after any kind of operation. The common feature in these two conditions is free movement. It is impossible to keep a child quiet: he will move his legs about, and turn on his side after an operation for acute appendicitis. It is in movement, I believe, that safety lies.

It is the common practice to adopt the dorsal position, with knee-pillow, after abdominal operations, and also after parturition. Looking upon this position as tending to slow the current, as possibly determining thrombosis, or at any rate its extension, I abandoned the method in all but grave cases of suppurative peritonitis. For many years no case of embolism has occurred in my practice, and this I have attributed to the free movement permitted. If the knee-pillow is not begun the patient never knows of the luxury: it is a luxury, and moreover encourages complete rest. Then the hips and knees are moved three times a day, and the patient is encouraged to turn on his side as soon as possible. He is made to lie quite flat in the bed for part of each day. Nurses looked horrified fifteen years or more ago when these directions were given, and even now it is difficult to get rid of the knee-pillow.

Is it necessary to keep the parturient woman on her back for days together? From my experience, after abdominal operations I am inclined to think early movement of the limbs and frequent changes of position would diminish the number of cases of embolism. The suggestion that movement of the body interferes with the success of abdominal operations of any kind, is disposed of by the fact that vigorous vomiting even for a couple of days seems to have no injurious effects, and no ordinary movements can produce as much disturbance of the parts as vomiting. It was this observation, indeed, that led me to abandon a recumbent position of the rigid sort.

Nor can the mere size of the veins explain the thrombosis and embolism. In the neck the internal jugular can be divided and ligatured with impunity. It is often exposed in septic areas, as are the large facial and lingual veins, and yet only once have I seen thrombosis extend into the subclavian, and that was because, after an extensive dissection for glands, I left the vein instead of resecting it. That the anatomical condition of the veins has probably a good deal to do with the occurrence is no doubt true. The veins are unsupported by muscle, and this mechanical check to extension is absent.

Again, the smaller veins running a straight course enter directly into large vessels, as, for example, the spermatic into the renal, and the infected clot is swept away by the strong current.

Summary.

1. Pulmonary embolism does not occur after operation above the diaphragm.
2. Nor in children.
3. The common factor in the after-treatment of these two examples is freedom of movement.
4. Usually after abdominal operations movement is restricted, the dorsal position is enforced, and the knee-pillow adopted.
5. It is suggested that this practice determines massive thrombosis by slowing circulation.
6. It is suggested that the above restrictions should be abandoned, together with the knee-pillow, and daily movement insisted upon.

THE faculties and schools of medicine in France had a total number of 10,045 students in 1914. In 1915 the number had fallen to 2,944, rising again to 3,263 in 1916 and to 3,375 in 1917. There were therefore 6,640 fewer in 1917 than in 1914. In 1914 there were 1,088 women students. In 1915 the number fell to 772, and in 1916 to 765, rising again to 822 in 1917. There were therefore 266 fewer women studying medicine in France than in 1914. In 1914 there were 1,421 foreign students. In 1915 the number was 625; in 1916, 539; and in 1917, 515.

Reports of Societies.

WAR NEUROSES.

Cinematograph Demonstration.

At a meeting of the Section of Neurology of the Royal Society of Medicine on March 12th, the President, Dr. R. PERCY SMITH, being in the chair, Major A. F. HURST, M.D., F.R.C.P., R.A.M.C., gave a cinematograph demonstration illustrating the essentials of treatment of soldiers and discharged soldiers suffering from functional nervous disorders. The series of films shown had been taken during the last nine months at the Royal Victoria Hospital, Netley, under the auspices of the Medical Research Committee, in order that a permanent record of some of the remarkable neuroses which had developed in soldiers should be obtained to form a part of the medical history of the war. At the same time they illustrated the development of methods of treatment pursued. A year ago the workers were satisfied if they taught a man admitted for hysterical paraplegia, which had already persisted for several months, to get about within a day or two of admission, but they realized that he would require several weeks of further treatment by re-education before he could walk normally. Increased experience had given them greater confidence, and they were now disappointed if they did not cure all cases of hysterical paralysis, contractures, speech defects, such as mutism, aphonia, and even stammering, and the tremors and tics, which were formerly regarded as incapable of rapid recovery, within twenty-four hours of admission, however long the symptoms had persisted before the men reached Netley. This was demonstrated in the slow but steady progress shown by the cinematographs of the early cases contrasted with the more recent films, which afforded actual records of complete recovery, in the course of an hour, from hysterical paraplegia which had lasted for several months. The one essential for success in dealing with hysterical cases was complete mutual confidence of patient and medical officer. From the moment the former entered the hospital he was made to realize that he would quickly get well. Hypnotism was no longer used, and very rarely such adjuncts of suggestion as electricity or etherization; the medical officers contented themselves with vigorous persuasion and manipulation, being convinced that it was greatly to the patient's advantage that he should feel that he had taken an intelligent part in his own cure and that there was nothing mysterious about the proceedings. The opinion was expressed that the men should be admitted direct from France into special country hospitals, with special medical officers, who knew how to create a true atmosphere of cure. Here, along with the neurasthenics and psychasthenics, they would quickly recover, by being given, when convalescent, healthy and interesting outdoor employment, instead of lounging about the wards and corridors of large general hospitals with no opportunity of taking exercise except in the streets. Most would eventually return to military duty, whilst the remainder would be discharged from the service after a few weeks or months, but never before they had recovered sufficiently to earn a living in some civil occupation of national importance.

Discussion.

Dr. E. G. FEARNSIDES said that there was no single system which might not be affected by a functional nervous disorder. The commonest mistakes were those in which diagnosis referred to muscles, nerves, joints, and the extremities, such as "myalgia," "rheumatism," "lumbago," "sciatica," "neuritis," "rheumatoid or osteo-arthritis," "trench feet," and "frost-bite." In many cases diagnoses of affections of the alimentary tract or pulmonary system were attached to patients whose real trouble was of psychical origin. The majority of patients diagnosed as suffering from "D.A.H." would be benefited by special treatment directed to the psycho-neurological aspect of their disabilities. Cases in which the diagnosis of organic diseases of the central or peripheral nervous system was made were much less frequent. Schemes for the distribution of soldiers or pensioners in houses, with isolated families, were impracticable, owing to the size of the problem; and, moreover, in such houses there was no