SOME NOTES ON CONTINENTAL SURGICAL PROCEDURE.

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PART II.

TREATMENT.

Under this heading I would wish to bring to notice two Continental procedures, the excellence of which does not appear to have received due recognition in this country.

The first of these is Professor Mosetig-Moorhof's method of filling bone cavities with iodoform wax.¹

This distinguished Viennese surgeon has for many years experimented with various substances in the hope of finding a material which, though liquid when introduced, would solidify in situ, and produce no irritation in the tissues. The outcome of his labours is a substance which he calls iodoform-knockenplombe, and is composed as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Finely powdered iodoform</td>
<td>60 parts</td>
</tr>
<tr>
<td>Spermaceti</td>
<td>40 &quot;</td>
</tr>
<tr>
<td>Oil of sesame</td>
<td>40 &quot;</td>
</tr>
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</table>

This compound is solid at room temperature, but becomes liquid on heating to 50°C. It is best kept in long narrow cylindrical bottles fitted with either rubber or glass stoppers. These should be only two-thirds full, as it is essential that when liquefied, by immersing the bottle in boiling water, the mixture should be thoroughly shaken to secure a perfect emulsion, as owing to its greater density the iodoform tends to settle to the bottom.

The technique of its use is not difficult, although some important points must be remembered. The steps in the operation are essentially those employed by a dentist in filling a carious tooth. The bone cavity, usually that left by the removal of tubercular deposits during the operation for excision of a joint, should first of all be thoroughly scraped so as to remove every particle of diseased tissue. It should next be irrigated with a 1 per cent. solution of formalin to get rid of all blood and traces

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of pus, scrapings, &c., which may have been left behind. The third and most important desideratum is that the walls must be absolutely dry. This can be accomplished by either the electric heater which has been devised by Dr. Silbermark, first assistant to the Professor, or by a very simple contrivance in which air is blown by means of a double rubber bag through two bottles, the first containing a solution of formalin and the second calcium chloride.

The plugging material, which has been rendered liquid by heat and well shaken, can now be poured slowly in. It usually sets in situ in a few minutes, and the superficial soft parts can then be united. No drainage is as a rule required. The ultimate fate of the plug is somewhat different if the wound is completely closed or if a sinus has been left. In the latter case the material is extruded by the pressure of the new-formed connective tissue which ultimately fills the cavity, while in the former case it is absorbed and removed by the lymphatic channels of the part and excreted in the urine. The fact that iodoform is an antiseptic and also a fairly strong bactericide hinders suppuration, which would otherwise be very common in cases with sinuses and mixed infection. Iodoform poisoning has never been observed by the Professor or any of his klinik. This is said to be due to the fact that the drug when introduced in this solid form is only absorbed by the tissues with extreme slowness.

Owing to the fact that iodoform gives a black shadow to the Röntgen rays the progress of the case can always be watched and the gradual absorption noted, as the accompanying skiagraphs taken from Professor Mosetig-Moorhof's book very clearly show.

In localities where, owing to its odour, iodoform is objected to, such as cases of disease of the antrum of Highmore, dermatol may be substituted in the same proportions; this substance may also be used in non-tubercular bone disease, such as osteo-myelitis, &c.

The results of bone plugging, especially in tubercular cases, are extremely good.

Another most interesting procedure is the Bier method of employing hyperæmia in the treatment of surgical diseases.1 Professor Bier, of Bonn, who has spent many years in elaborating his treatment, lays down several fundamental postulates in support of his theory. They are, first, that every generation and regeneration of tissue is accompanied by hyperæmia; second, that every invasion of the tissues by a foreign body, whether bacterial or non-bacterial,
Fig. 1.—A case of osteomyelitis of the lower end of the tibia before operation.

Fig. 2.—The same case with diseased tissue removed and the cavity filled with iodoform wax, two weeks after operation.

Fig. 3.—Same case twelve weeks after operation.

Fig. 4.—Same case thirty-three weeks after operation.

To illustrate article by Captain F. F. Carroll, R.A.M.C.,

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at once calls forth a reflex hyperaemia. Therefore, hyperaemia is Nature's method of repair in all diseased conditions, and if artificially produced will not only aid but enormously hasten the reparative process. He divides artificial hyperaemia into active and passive, and defines the former as that condition where, owing to dilatation of the arteries, the flow of blood to the affected part is increased, and the latter to that condition where, owing to constriction of the veins, the return of blood from the part is materially impeded. Active hyperaemia can be produced by many agents, such as massage, electricity, chemicals and heat.

With regard to heat, Bier has made many interesting experiments, and has come to the conclusion that dry heat in the form of hot air is the simplest, most easily regulated, and best method of employing this remedy.

He uses boxes of different sizes and shapes to accommodate all parts of the body. The boxes, which are usually made in two halves, are simply constructed of wood and lined with felt. If intended for a limb a felt sleeve which projects from each opening is securely fastened round the part with a bandage. Each box is provided with a thermometer graduated to 120°C, which passes through a hole in the lid. The source of heat is usually a Bunsen burner, but any small spirit lamp can be used; this is placed at some distance from the chamber under an inverted funnel, from which the hot air is led to the box by a tin tube, exactly in the same manner as Wyatt's vapour bath is used. Bier recommends that the affected part be kept in the hot air for one hour daily at a temperature of from 80° to 100°C.

Passive hyperaemia is produced by constricting the veins without interfering with the arterial blood flow to any great extent. This end is attained by employing an elastic bandage placed between the seat of disease and the heart, and cannot, of course, be applied to the trunk. The bandage should be of thin rubber, about 3 cm. broad by 2 m. long. In applying it is needful to note carefully the degree of pressure. This should be sufficient to occlude the veins, but should leave the distal pulse unimpaired. A little practice is necessary before the right amount of tightness is found.

Bier himself lays down the following rules:

(1) If the bandage has been properly applied the limb will be found to become uniformly swollen from the edge of the bandage to the periphery, and to show at the same time a bluish-red colour. At first the subcutaneous veins swell and the skin becomes bluish, then after about half an hour the colour changes to bluish red.
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(2) If the limb does not become blue it is a sign that the band has been applied too tightly and that the artery is also compressed.

(3) The best indication that the bandage has been properly put on is that in a few minutes the patient will cease to feel any pain in the part; if too tight the pain will be increased, if too slack it will be undiminished.

(4) The bandage should be allowed to remain on the limb for from twenty to twenty-two hours. Then taken off for four hours and reapplied. In the interval the limb should be raised so as to cause absorption of the œdema.

The surgical diseases which have been found to benefit most by passive hyperæmia are all acute inflammatory conditions of the skin and connective tissue, such as boils, septic wounds, whitlows, &c., inflammation of the tendons and their sheaths, inflammation of the long bones, including septic periostitis, osteo-myelitis, &c.; all forms of arthritis, whether tubercular, gonorrhœal, or septic. Hot air is most useful in more chronic conditions, such as stiff joints, rheumatic arthritis, sciatica.

I hope, in a later number, to publish the results of these procedures as employed personally in military hospitals.
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