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MODEL HYDROTHERAPEUTIC INSTALLATION FOR SOLDIERS,
WITH GROUND PLAN.

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DESCRIPTION.

This installation is designed to provide the most necessary and valuable methods of hydrotherapeutics for wounded and invalid soldiers. As will be seen from the accompanying ground plan, it is arranged within the compass of a single hut (sixty feet by twenty feet). It is, in fact, a *multum in parvo* of bath treatment. The building is warmed throughout by steam pipes from the same boiler that serves the baths. It is intended that one attendant should take charge of the rooms, with the exception of those for the treatment of disabled limbs. This latter department has a separate access and exit, so as to accommodate large numbers of men without any disturbance of the bath rooms. The installation should be placed in connexion with, or at least conveniently near to, the hospital or buildings where the men are lodged. The pool bath will often be used in the evenings or at nights, and those for whom it is prescribed—for example, men with depression or insomnia—ought to be conveyed after the bath to their beds, with as little possible delay, fatigue and exposure. In many cases it will be found best that they should be wrapped in warm blankets and taken in a wheeled chair from the pool room to the ward.

The *douche room* is fitted with a series of shower baths and a proper nozzle douche, with varying pressure and temperature, a needle bath, and a screen for the use of local douches to the limbs. In the adjoining passages are *cubicles* for dressing and undressing, and a closet for *linen*, heated by steam pipes. An ample provision of hot bathing sheets and towels greatly enhances the value of the baths, especially in the cold season.

The *tubs* (three) for brine and effervescing baths, etc., are best served in a separate room.

The *pool* is designed to give long-continued baths at a constant temperate heat. The pool chamber adjoins the boiler house, has no external walls, and is well supplied with steam radiators. By this means the temperature is kept at about 60° F. day and night. This bath is designed entirely for sedative treatments, and is therefore as quiet and undisturbed as possible. A waterproof curtain divides the bath from the vestibule (for undressing), and serves to minimize draughts. The pool...
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(eight feet by eight feet) is of such a size that ten men can be comfortably seated in it. The water is flowing and constantly renewed, and is maintained at a uniform temperature (93° F. to 95° F.), by means of a calorifier fitted with a thermostatic valve.

The department for disabled limbs consists of: (1) A room for hyperthermal local applications: "whirl baths" (eau courante), hot air and radiation baths, etc. (2) A room fitted with tables for massage and manipulation and simple apparatus for mobilization of the joints.

The boiler house outside the hut supplies hot water at the required temperatures for all the baths, and steam heating for the building.

Indications and Directions.
The above installation is designed to provide:—
(a) General treatment: (1) Tonic; (2) sedative; and
(b) Local treatment for disabled limbs.

Tonic Treatments.

A variety of tonic treatments for convalescent soldiers may be given in the large and commodious douche room. Brief and refreshing shower baths, beginning warm (95° F. to 100° F.), and finishing cold after two minutes, can be given daily to large numbers of men. Provision is made for operating nine such baths simultaneously. They may be freely ordered as a daily treatment for men out of condition, in whom the circulation is slow and feeble, and nervous reactions are sluggish and depressed—neuro-vascular atony. Cold after heat, in this form, stimulates oxidation, and so increases bodily warmth, invigorates the heart and circulation, and powerfully stimulates the nerve centres. Like other tonic baths cold showers are contra-indicated when the heart's action is too frequent, and when the nervous reactions are exaggerated neuro-vascular irritation.

A more powerful tonic bath is the nozzle douche, the stimulant effect of which can be heightened by increasing the pressure of the water. The douche should always begin warm, and finish after one, or at most two minutes, as cold as can be comfortably borne. For very atonic subjects two jets (at 100° F. and cold, respectively) can be used simultaneously. By this means rapid alternations of temperature are applied to the limbs and spine. The alternating douche is indicated for chronic neuralgias and for atonic and spinal neurasthenia, also for mental depression and malingering.

Tonic and Sedative.

Tub baths are commonly given at 98° F. (blood heat), with a duration of ten to fifteen minutes. Where a long-continued bath (half an hour to two hours or more) is desired, the temperature should be lower (94° F.), and regulated by the attendant. Such continued baths have been found beneficial, inter alia, for imperfectly healed and painful wounds.
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Very brief hyperthermal baths (105° F. to 115° F.) may also be given in this room, in cases of sluggish circulation, "fatigue fever" and "muscular rheumatism." The first effect of very hot baths is to stimulate the heart and to dilate the superficial arterioles. They restore the normal course of the circulation in many painful conditions of vascular stasis, and so sweep away the accumulation of waste products. It is of great importance not to prolong the duration of a hyperthermal bath beyond two, or at most three minutes, otherwise the first stimulant effect of heat will be followed by debility, and the good effects be lost. Moreover, all hot and very hot baths should be terminated by a momentary affusion with cold water. For this purpose a small hand bucket should be filled at the cold tap, and poured over the chest and spine of the patient before leaving the bath. Brine baths and effervescent (carbonated) baths are also given in this room, the former in cases of muscular and tendinous "rheumatism," and the latter for cardiac debility.

Sedative Baths, Pool Chamber.—This bath will be found helpful in all conditions of neuro-vascular irritation, from the psychical level downwards. The patient is seated in flowing water at a temperature nearly equal to that of the skin. The sedative effect is proportional to the duration of the bath, which may be extended to several hours. These prolonged and "sub-thermal" baths are especially indicated in cases of mental disturbance, with depression and irritability, due to exhaustion of the nerve centres, and are also used for insomnia and restlessness, and for shock, peripheral neuritis and neuralgia. The massive equable impression of the water, at a constant temperature, allays irritation, slows the heart and favours sleep.

Local Treatment for Limbs disabled by Wounds.

This may be described as a combined treatment by heat, moisture, manipulation and movement, similar to that employed at the Hospital for the Physical Treatment of Disabled Soldiers at the Grand Palais in Paris (see this Journal for October last, and the Lancet of February 5, 1916). In the first chamber are installed the whirl baths for the arm and leg respectively. In them the limb is subjected to a rotatory current of water, rising in temperature from 110° F. to 115° F., or 120° F., or even higher, according to individual toleration (Balnéation à l'eau courante). The duration of these baths, which are usually given daily, is from fifteen to thirty minutes. Such applications greatly increase the arterial and lymph circulation in the injured part, promote the absorption of effusions, and accelerate the retrogression of inflamed tissues. They also have a marked sedative effect in relieving pain and muscular spasm. They are consequently used inter alia for trophic lesions resulting from prolonged suppuration, chronic oedemas, swellings of the peri-articular tissues, fractures of the articular ends of the bone and painful and adherent
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cicatrices. Hyperthermal whirl baths may be given with advantage in every case as a preparation for massage and movements, which are by their use rendered easier and less painful. Similar baths at a lower temperature promote the cleansing and healing of wounds and the separation of dead tissue.

Following these applications of heat, the limbs are submitted in a second room to massage and mobilization. In this room simple mechanical apparatus may be with advantage installed.

Records.

The physical methods employed with these various baths, both general and local, and the results obtained, may be conveniently recorded on a card resembling that used at the Grand Palais Hospital, which has been prepared by a committee of the Section of Balneology and Climatology of the Royal Society of Medicine. These cards have been approved by the Medical Research Committee, and will form part of the data for the medical history of the War. They will be supplied on behalf of the above committee by the printers, Messrs. Adlard and Son, 76, Newgate Street, E.C.

Note.—A "continuous bathing installation," by means of a pool, as well as tonic baths and rooms for the local treatment of disabled limbs, similar to those above described, have now been erected at the Command Depot at Tipperary.

A complete installation of sedative, tonic and local baths, according to the above plans, has also been approved for the Command Depot at Heaton Park.

TRENCH FEET.¹

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In the winter of 1914-15, a number of cases were admitted to the field ambulance with which I was serving, suffering from what was at first spoken of as "frost-bite," but which is now better described as "trench feet" or "chilled feet."

I can only, in this paper, present the condition as we saw it in the first stages, leaving to others to recount subsequent progress and the treatment adopted at the base.

As to the pathology of the condition, the first point noticed was the marked similarity to Raynaud's disease. The two varieties of that disease, the congested and the white, were exactly reproduced. The majority of the cases resembled the congested type, but a certain proportion had no swelling, and exhibited only a dead white foot. This suggested that the pathological condition underlying the affection was a

¹ Read before the Medical Society of the III Corps, British Forces, France.