

anything less than the highest, our morality will be always on the downward grade. Before the war it was being said that the English nation was decadent. Men, with their blood, have wiped out this reproach. Every individual, man, woman and child should by high ideals—which can only be attained by the sacrifice of greed and selfishness—help to retain that which has been so dearly bought.

THE TREATMENT OF SEPTIC WOUNDS BY THE ELECTROLYTIC BATH.

Dr. Frank Fowler, Medical Officer in Charge of Electrical Department, Royal Victoria and West Hants Hospital, Bournemouth, writes in the *British Medical Journal*:—

There has lately been much discussion of the possibility of sterilizing wounds by antiseptic lotions. A weak solution will not kill the septic organisms, and a strong solution will kill those it can reach, but produces a slough, which provides excellent culture material for those deeper in the tissues. The question asked was: "How can we attack those germs which remain in the tissues?" Bacteriologists have had some success in this direction with vaccines and serums, utilizing and fortifying the natural resistance of the body to the infection.

It did not occur to anyone to ask—How can these germs be induced to leave the deep parts? The idea that a Pied Piper should arise to call them from their fastnesses to be destroyed seems fantastic; yet it appears that this is not only possible, but in many cases easy. The credit for the discovery belongs to Dr. Charles Russ, who found that nearly all germs are carried towards the positive pole of an electric current passing through a solution of sodium chloride, and that the small current required is lethal to the bacteria without the need for any aid from the ionization of various drugs, such as the salts of zinc and copper, which have been much used for the purpose of introducing an antiseptic into the cells.

The practical results of treatment seem to support Dr. Russ's observations. I have been much impressed by the success obtained in every case that I have treated. I will only describe one, a perforating gunshot wound of the foot, with a crater on the dorsum leading to a tunnel through which the little finger could be passed, and which opened on the sole of the foot. The whole wound was welling with pus, and it seemed doubtful whether the man's leg could be saved; five days later granulation

tissue was level with the skin at both wounds, which were surrounded by a healthy looking ring of new skin.

The action of the current is not confined to carrying bacteria from the wound, but also stimulates the formation of granulation tissue and epithelial growth.

The treatment opens up a wide field for further research in the treatment of many intractable conditions. Dr. Russ reports some cases of chronic cystitis in which it has produced very satisfactory results.

Apparatus.

The only apparatus required is a battery of 20 to 30 dry cells with a current collector and a good milliampèremeter reading to 25 m.a. with a shunt to 250 m.a.

Baths.—A Schnee four-celled bath is very convenient, but any vessel will do if it is long enough to immerse the forearm and hand, or deep enough to cover a wound of the foot or leg; wounds of the other parts can have a local bath applied, such as a glass cylinder made water-tight with plasticine, as suggested by Dr. Russ, and filled with a warm saline solution.

Electrodes.—Two electrodes are necessary—the carbon of a Leclanché cell serves admirably, or they can be cut from sheet zinc. One is immersed in the bath with the wounded limb, and this must be connected with the positive pole of the battery, marked +. The negative pole has to be connected to some (indifferent) part of the body, either in another bath, or the electrode may be placed under the back of the patient, separated from the skin by sixteen thicknesses of lint soaked in warm salt solution—this pad should be 12 in. square, and must be well washed after use to remove any trace of caustic soda produced by the current.

Method of Treatment.

The wounded limb being placed in the bath and covered with warm normal saline solution, the negative pole connected to some other part of the body, the current should be slowly turned on from zero until the meter registers 20 to 30 milliampères. This current, which the patient will barely feel, is sufficient for an average bullet wound; for larger wounds the current must be increased proportionately. The patient must be warned not to take the limb out of the bath until the current is quite turned off, or he will get a shock; for the same reason the turning off of the current at the close of the treatment must be gradual.

Treatment should be given daily, for half an hour on each occasion.

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