

two factors. The difference lies in variations of the relative value of these factors.

These internal differences (of the relative value of electro-motive force and current-strength) will be considered later on; at present we desire to impress upon our readers the fact that electricity is practically the same, however generated.

It follows, then, that the source from which electricity for medical purposes should be drawn, or, in other words, the form of generator used, is to be determined by considerations of convenience and economy only.

COMPARISON OF GENERATORS.

For medical purposes we require an electric generator which shall be (1) always accessible; (2) easily controlled; (3) steady in its action; (4) not liable to disturbance by ordinary atmospheric changes; (5) not troublesome by reason of its noise or unpleasant fumes; (6) as small as possible; (7) not costly to purchase or maintain.

Let us see how far the classes of generators above referred to fulfil these requirements. Of the mechanical class we will take the dynamo, passing over for the present the frictional or other static machine. A dynamo may be expected to fulfil conditions 1, 2, and 4, but not the others. It requires to be driven by steam, gas, or water engine; is costly to purchase and maintain; involves generally noise (by its motor engine), and moreover generates far larger quantities of electricity than are required for electric treatment in most Hospitals. Given an establishment with many patients requiring electric treatment, and electricity required also for other purposes, such as light and power, it might well be that a dynamo driven by an engine would be the best form of generator to use; but extreme care would be necessary to get condition 3 fulfilled. A dynamo current may be quite steady enough for such purposes as light and power, but far too unsteady to be used with safety upon the human body. Steadiness in action is a most important condition, and as the fire, the engine, the belting, and the dynamo itself, each and all form separate possible sources of irregularity, we do not consider it advisable under any circumstances to draw current direct from a dynamo for medical purposes. If accumulators or secondary batteries be interposed the condition is very much improved, but these belong more properly to the chemical generator class.

The thermopile may fulfil conditions 1, 4, and 6, possibly 7 also, but it is difficult to control, seldom steady in its action for long, is almost sure to give off unpleasant fumes, and is costly both to purchase and maintain. To get currents of useful strength very many pairs of metals must

be used, and their arrangement for efficient working renders it very difficult to get at and repair any of the couples which get out of order. Consequently the difficulty of control and cost of maintenance are very great.

Until the thermopile be much improved, therefore, we cannot consider it a suitable generator of electricity for medical purposes.

Chemical generators usually fulfil conditions 1, 2, 3, 4, 5, in part 6, and in some cases 7. They are very far from perfect in the way in which they fulfil these conditions, as we shall have to show in the next lesson; but as matters stand, chemical generators are the most convenient to use for medical purposes.

(To be continued.)

NURSING ECHOES.

*** Communications (duly authenticated with name and address, not for publication, but as evidence of good faith) are especially invited for these columns.*

I HEAR that Miss Catherine J. Wood has resigned the post of Secretary of the British Nurses' Association, to which she was appointed about a year ago. Many fanciful reasons have been assigned for this step, and many wild conclusions drawn. The real reason, I am told, is that Miss Wood found herself unable, from pressure of other work, to discharge, to her own satisfaction, the duties of the paid appointment. The Executive Committee at once re-elected Miss Wood Dr. Bedford Fenwick's colleague, as *Hon.* Secretary, and has now, I learn, appointed Miss Helen Foggo-Thomson as Secretary. Miss Thomson has already made her mark at the Association Meetings, and I heartily wish her all success in the important post in which she has now been placed.



I WAS unable last week to give a description of the meeting of the British Nurses' Association, held on January 17, at 20, Hanover Square, W. There was a large attendance, although many who knew Miss Mollett had left England evidently imagined that the meeting announced to be opened by her would not be held, and others did not care to face the inclement weather. Miss Hope took the chair. The minutes of the last meeting were read and confirmed, and then Miss Wood read the paper prepared by Miss Mollett. I am glad to hear that it will appear in these pages, for it is most interesting. As usual, the

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