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ELECTROLYSIS IN SURGERY.*

BY ROBERT NEWMAN, M.D., NEW YORK.

Of late it has become a fashion to lecture on the progress of the future. In a temporary mood of enthusiasm, during a lecture delivered fifteen years ago, I predicted and anticipated the progress of electricity in general in such a way that everybody considered it romancing, as a good joke. How far I was then behind the reality, nobody, myself included, had the faintest idea, and what are now accomplished facts, nobody would have thought possible in those days. For instance, the telephone, phonograph, incandescent light for illuminating streets, dwellings, railroads, steamboats, and cavities of the human body; the motor for railroads, factories, and the application in surgery.

Therefore, knowing how I have failed in predicting the progress of the future, I will confine myself to some remarks of the day. As the field is too large, and another paper on "Electricity in Gynæcology" is on your programme, I will make my text more on "Electrolysis in Surgery."

Electrolysis is the decomposition of a compound body by electricity—a chemical decomposition. The body to be decomposed must possess certain elements to be an electrolyte, and as a compound body, must contain water and a salt.

Nicholson and Carlisle discovered this process of electrical decomposition in 1800, and successfully electrolysed water into oxygen and hydrogen, therefore the theory is not new, and the explanation can be found in any text-book on elementary physics and chemistry. Only the galvanic current can be used for this purpose.

The art in applying electrolysis successfully in surgery consists in:

1. Using the correct strength of the electric current.
2. Applying the respective poles in the right place.
3. Selecting the size, shape, and material of the electrode.
4. Regulating the *duration* and intervals of seances.

Electrolysis applied with a mild current will cause absorption only—a galvanic, chemical absorption—while a strong current will burn, cauterize, or even destroy tissues. Therefore the operator must know what effect he wishes to produce, and graduate the strength of his current accordingly. The management of the operation must be such that every possible mishap is anticipated and prevented.

The first necessity is to see that the galvanic battery is in perfect working order, and for this the following tests can be made. To illustrate, Dr. Charles R. Dickson, of Toronto, has kindly furnished me with a galvanic battery, and will assist me in these experiments demonstrating and executing the text which I am explaining.

*A paper read at the meeting of the Ontario Medical Association in Toronto, June 6th, 1889.