

but that they give off their charge to the next in series, and so on to be passed along to the end of the electrolytic circuit, where the electricity is either given up to the electrode or converted into another form of energy by a combination of the carrying atom with others.

Hitherto the human body has been measured electrically merely as a conductor or as a resistance, but the more rational proceeding would seem to me to consider it as an electrolyte.

In electrolysis of organic tissues there are probably several processes to take into account. In the first place, it is extremely likely that the water of the tissues with certain salts, acids, and other compounds in solution yields to the disruptive power of the current, and hydrogen with other electro-positive ions are set free or recombined at the negative electrode, while oxygen and negative ions are separated at the anode.

But while this liberation of atoms and molecules takes place at the terminals of the battery, what is going on in the track of the contrary processions of ions between the electrodes? In other words, is there any interpolar action of the current, and in what does it consist? In my opinion, there is of necessity a loosening or shaking up of the interpolar compounds which results variously according to the vitality of the tissues. If the current is of moderate strength and the tissues have the normal degree of vital resistance, the molecular disturbance will probably result merely in an improvement of nutrition, in accordance with the general biological law that moderate stimulation produces increase in nutrition. If the current is of excessive strength, there will probably be some breaking up of compounds which may effect nutrition unfavorably. I think every one who has used electricity much and observantly must be able to recall cases where this explanation would be at least a plausible one.

Actually, we know really nothing of the interpolar effects of electric currents in organic tissues. In inorganic compounds, with their simple and stable organization, the electric current may not produce any interpolar change, although the theory of Clausius rather favors the view that interpolar decomposition occurs; but in organic compounds, with their more complex and unstable composition, we can readily understand that the continual rearrangement of molecules under the influence of electrolytic conduction may so disturb the harmoni-

ous relations of the molecules as to render decomposition more easy. If the tissues are normal; recovery and repair of slight defects may promptly follow, but in the case of pathological products—inflammation, infiltration, new growths, serous effusions, etc.,—it stands to reason that a molecular disturbance of some extent or continued for some time may produce such a modification of nutrition in the tissue as to promote its regressive metamorphosis. That this actually takes place I firmly believe, although I am unable to give an exact demonstration of the process. I am also strongly of opinion that in many pathological products or tissues a retrogressive change begun under the influence of an electrolytic current is kept up after the immediate action of the current has been discontinued. I need only refer here to the numerous examples of cure of new growths, inflammatory deposits, and serous collections on record. A brief reference to one case under my own observation may not be out of place here. In 1886 I gave a partial report of a case of goitre treated by electrolysis. The tumor grew smaller under the applications, but the diminution in size did not cease with the discontinuance of the treatment. The regressive tendency set up continued until at present the tumor has almost, if not quite, disappeared. Similar results are alleged by gynecologists who have properly used the electrolytic method in fibroid tumors of the uterus according to the method of Apostoli. My friend, Professor Hardaway, has reported analogous results with cases of keloid and hypertrophic scars, and my experience with such growths as fibromata, vascular naevi, epithelial and papillary neoplasms is strongly corroborative. At first I was disposed to attribute this continued effect of the electrolytic applications to a condensation of connective tissues robbed of part of its nutrition, but further study has led me ascribe a share of the result to the continuous modification of vital activity impressed upon the tissue by the electrolytic current. The progressive disappearance of serous collections (hydroceles, arthritic effusions, cysts of various kinds), and of inflammatory infiltrations after interruption of the electrolytic séances must, I think, be attributed to a similar action. On no other hypothesis known to me can these results be so rationally explained.

In the electrolytic action most frequently made use of in dermatological practice—namely, extirpa-