

are rubbed together both kinds of electricity are produced and in equal quantities. Thus, if we stretch a piece of silk over a brass plate and rub it with a warmed glass rod, while the rod and silk are in contact we can bring them near to the disk above mentioned without it being in the least affected; but if we separate them and bring the glass near to the disk the latter will be at first attracted and then repelled; and if, while in this state of repulsion from the glass, the silk be brought near to it, it will be attracted. Therefore we see, that in the combination of the glass and silk we had the two electricities developed on friction: so long as we kept them together they had no effect on the disk, therefore they must have been equal in quantity, and we have shown that they are opposite in action, so they exactly neutralised each other. Without discussing the various forms of apparatus for producing electricity by friction, etc., we will consider what is known as *voltaic electricity*, as it is of the greatest therapeutical value. It is well-known that no chemical action can take place without the production of electricity. Voltaic electricity is that form of electrical energy set in motion by chemical action and is produced by the contact of two dissimilar elements in the presence of a liquid. If a plate of zinc is immersed in dilute sulphuric acid, the zinc will be dissolved and hydrogen gas given off; but if the surface of the zinc, after being thoroughly cleaned, is rubbed over with mercury, an amalgam is formed which will prevent the action of the acid on the zinc for several hours. The reason for this is not exactly known, but the fact itself is constantly made use of. If we place one of these plates in a vessel containing dilute sulphuric acid no action occurs. We may also put in a second plate and still no action occurs, even if we allow the plates to touch one another; but if we replace one of the prepared zinc plates by a copper or platinum plate, no action ensues while the plates are separated, but immediately on allowing them to touch each other, chemical action ensues and the zinc is dissolved, hydrogen being at the same time liberated from the platinum plate; the latter, however, is not in any way acted upon. It is not necessary for the plates to be in actual contact, because some medium such as metallic wire, piece of graphite, etc., *i. e.* any *conductor* of electricity, may be used to connect them; but if, while they are in contact, some substance such as glass, wax,

shellac, etc., *i. e.* *non-conductors* of electricity, be interposed the action, which has been going on, immediately ceases. Thus we see that there are substances which will allow the electric current to pass along or through them and others which will not. This is of practical importance to us, as by using a *conductor* to convey the current to the point at which we want to use it, and, at the same time covering portions of our conductor with some *non-conducting* material, we may protect any of the surrounding tissues we wish. This process is known technically by the term *insulation*. The *voltaic circuit* produced, when two dissimilar metals are connected with one another in the presence of a liquid which acts chemically upon one of them, has other effects to be considered outside of the action in the cell. We will consider the phenomena produced by the passage of the current along the wire which connects the two plates. First, we have heat developed by the molecular friction of the current. We utilize this action in our galvanocauteries. Second, we have the influence exerted by the wire over a magnetic needle. If a magnetic needle be placed parallel to a wire in circuit it will tend to place itself at right angles to the wire. All parts of the circuit, including the liquid in the cells, have this action. On this basis there has been constructed an instrument—the galvanometer—for detecting and measuring the most delicate currents.

W. B. N.

Effects of Antipyrin.

Antipyrin is receiving great attention for the remarkable anodyne effects it produces, which allied to its undoubted antipyretic qualities make it a most valuable drug. Germain Séc, in his report to the Academy of Science, on the action of antipyrin, subcutaneously in place of morphine, gives it unqualified praise. The ready solubility of the drug makes it especially valuable in this way. He injects 8 grs. dissolved in 8 minims of distilled water given as one dose. In chronic articular rheumatism 3 injections with 35–60 grs. daily for some time, gave excellent results. In neuralgias, lumbago, etc., it has cured pain. In patients suffering from biliary calculi, it gives the best results—here it has the advantage over morphine that it does not affect the secretions;—in nephritic colic it has the same advantage over morphine as above. In painful heart affections and angina pectoris; in