

When the zinc is used up a new disk is inserted, and it is best then to put in new paper.

The electromotive force is the same as that of the Daniell element. M. Trouvé has made many applications of this battery, notably to medical apparatus and to the purposes of military telegraphy. In Fig. 47 is represented the form for the latter purpose. The battery is composed of three hard rubber boxes, superposed, and each containing three elements. This has sufficient power to work a sounder over several miles. It may be carried upside down or in any position.

New Form of Leclanché Battery.—In this battery the depolarizing element consists of an agglomeration of powdered carbon, peroxide of manganese and gum-lac. This mixture, subjected to hydraulic pressure, forms the blocks seen on opposite sides of the carbon. The zinc rod is separated from the carbons by a triangular piece of rubber or other insulating material, and the whole is bound together, as

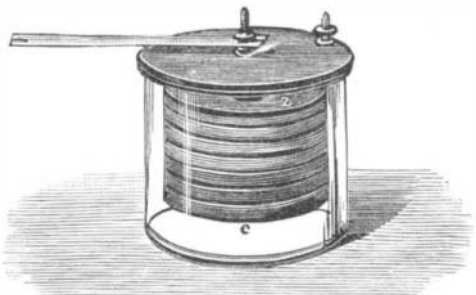


FIG. 46.



FIG. 47.

TROUVE'S MOIST BATTERY.

shown in the cut, by means of bands of rubber or other non-conducting material. It will be seen that there is a recess in the inner face of each depolarizing block. The internal resistance of the battery will not be greater than that of the liquid contained between the depolarized and the carbon plate.

It is stated that these batteries have been used in telegraphy for 18 months without attention.

These elements will rest indefinitely charged, the internal chemical action being null when the current is not closed. The depolarizing action of the agglomerated plate is so great that a single fragment clamped to a thin plate of polarized carbon is sufficient to depolarize it entirely in less than a minute.

Carbons.—A piece of clean coke, or a piece of carbon from a gas retort, may be used in these batteries. While it is best to buy the carbon from dealers in electrical apparatus, it may be prepared as follows: Take clean finely ground coke, mix with it pulverized coking coal, ram the mixture

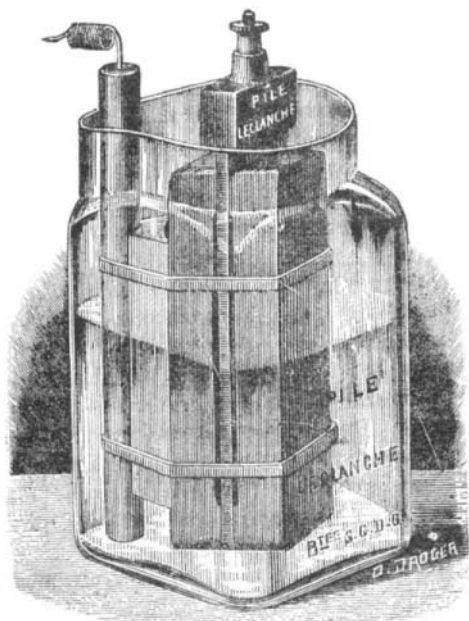


FIG. 48.—NEW FORM OF LELANCHÉ BATTERY.

into an iron mould, and expose to the heat of a furnace until the gas is expelled from the coal. The mould and its contents are allowed to cool before the carbon is removed. The carbon is now dipped into a sirup of sugar dissolved in water, and subjected to heat, which is sufficient to carbonize the sugar.

Care of Carbons and Porous Cups.—After long use the porous cells and the carbons should be soaked in warm water.

Amalgamation.—The zinc in all batteries, except the Daniell and its modifications, must be amalgamated. This is easily accomplished by first dipping the zinc in dilute sulphuric acid (acid, 1 part; water, 15 or 20 parts) to remove scale and dirt, and afterward spreading on a little mercury, which soon spreads and covers the entire surface of the zinc.

Bunsen's or Grove's batteries may be amalgamated by pouring a few drops of mercury into each cell containing the zinc. The zincs will remain amalgamated as long as any mercury remains in the cell.

Volt.—The unit of electromotive force is called a volt. It does not differ materially from that of a Daniell cell.

Ohm.—The unit of resistance to the passage of an electric current is called an ohm, and is about equal to that of a cylindrical copper wire 1-20 of an inch in diameter (No. 20, Birmingham gauge) and 250 feet in length, or of 330 feet of iron wire, No. 9 (0.155 inch diameter) of average quality.

Weber.—The weber is an electrical unit by means of which electricians are enabled to convey definite information regarding the strength of a current. A volt divided by an ohm equals one weber.

NEW YORK PATHOLOGICAL SOCIETY.

November, 1878.

DR. J. C. PETERS, President, in the Chair.

A SURGEON LOSES HIS RIGHT HAND—REMARKABLE FORTITUDE.

DR. BRIDGON presented a second specimen, which consisted of the right hand, which had been severed by a heavy cutting-knife in a bookbindery. The victim of this unfortunate accident was Dr. Leavitt, of this city, who exhibited a coolness and fortitude under the great mental and physical strain which constituted the remarkable feature of the case. On the afternoon of October 29 the patient paid a visit to a bindery, in which he was peculiarly interested; and while standing by the machine, accidentally set in motion, the knife came down upon his right hand, severing it just below the wrist and through the second row of carpal bones. Dr. L. promptly seized the stump, controlled the hemorrhage, covered the wound with bandages, and then wrapped the right hand in a towel and rode in a street-car from Fourteenth street to Fifty-first street, a distance of nearly two miles. Dr. Bridgdon was asked by Dr. Hadden to see the case in the evening, when a consultation was held with Drs. Hadden, Geo. F. Shrady, and Beckwith, resulting in a decision to amputate at the wrist-joint. During the consultation the patient himself discussed the practicability of merely trimming the stump and not sacrificing the carpus. The skin was so extensively separated from the dorsum of the wrist that it was impossible to cover these bones, there being barely enough integument upon the palm for a stump of the wrist. After the operation was determined upon the patient busied himself in arranging his room, in fixing the operating-table, and attending to many other details. He carried his personal interest in the operation to the extent of requesting that no ether should be administered to him. This wish, for obvious reasons, was not gratified. The amputation was performed in the usual way, and a flap was made from the palm of the hand.

EPITHELIOMA—BLEPHAROPLASTY.

DR. NOYES exhibited a small specimen of epithelial growth removed by operation from the eyelids, which was of interest in connection with the means used to fill up the gap which was left. The patient was a lady aged 50 years. Nineteen years ago she noticed a small growth on the inner border of the lower lid, near the punctum. This remained stationary for ten or twelve years, when it began to spread along the border of the lid and at the same time broke down in ulceration. Within the past year the disease extended itself over the lachrymal sac, involved the inner portion of the upper lid, and made in all a tumor the size of a hazel nut. Two-thirds of the lower and one-third of the upper lid were occupied by the disease as well as the adjoining side of the nose. The operation of removal was performed without difficulty, the tumor shelling out from the underlying tissues easily. The lachrymal sac was exposed, but was not opened. Actual cautery was employed along the inner portion of the wound. In order to fill up the deficiency of the growth occasioned by the extirpation, a vertical incision was first made in a line with the inner canthus and along the side of the nose to the reflection of the mucous membrane of the gum. From the outer canthus an incision was also extended horizontally across the malar bone to within a half inch of the ear. The flap thus created was dissected up and slid inward toward the nose, thus restoring the lower lid. A space was left on inner canthus and inner portion of upper lid. An attempt was made to fill up this space by transplanting a severed portion of skin from the arm, according to the method proposed by Mr. Wolf of Glasgow. But sloughing of this piece occurred, owing, as Dr. Noyes thought, to the fact that actual cautery had been previously used in that portion of the bed of the wound. Union occurred by first intention throughout the flap for the lower eyelid. A second attempt to fill up the vacancy of inner portion of upper lid was made shortly afterward. An incision from the upper limit of the gap was made horizontally across the root of the nose, and then at right angles downward. The flap thus created was turned upon itself edgewise and accurately adapted to the edges of the gap. Her recovery was complete and satisfactory. The tumor was examined by Drs. Bull and Satterthwaite, and found to be an epithelioma.

REMOVAL OF MELANOTIC EPITHELIOMA FROM EYEBALL, SAVING THE EYE.

DR. NOYES presented a small malignant tumor which he removed from the exterior of the eyeball, and at the same time preserved the eye. The patient was a gentleman, aged forty-eight years, who first noticed a small black speck on the white of the left eye seventeen years ago. This remained stationary for twelve years, and then grew slowly for five years. Within the past year the increase had been very rapid, presenting a black raspberry appearance, overlapping the outer third or more of the cornea and nearly as much of the adjacent sclerotic. On looking at it, the first impression was that it grew from the interior of the eye; but a closer examination showed that the eye was perfect, and that the eyeball was not affected. The patient came to Dr. Noyes after having seen other ophthalmologists, who advised enucleation of the eye. It struck Dr. Noyes, however, that the tumor could be detached from the surface of the globe, and he accordingly made the attempt. The

operation was performed by a curved scissors, and was entirely successful. The tumor grew from the episcleral tissue and from the limbus. The surface of the wound was easily covered by dissecting up the edges of the conjunctiva and bringing them together. The growth was examined by Drs. Bull and Satterthwaite, and found to be a melanotic epithelioma. Dr. Noyes concluded the presentation of this interesting specimen by an exhaustive review of the literature of the subject.

IMMENSE VESICAL CALCULUS.

DR. WEIR presented an immense vesical calculus removed by Dr. C. T. Gardner, of Providence, R. I. It weighed twelve and a half ounces, measured in its several diameters three and three-eighths inches, three and one-eighth inches, and two and a quarter inches, and had for a center a small oxalate calculus, the periphery being made up of phosphates. The operation for its removal was commenced with the lateral incision, but was afterwards extended into the bi-lateral section, as the instruments on hand were insufficient to crush it *in situ*. The patient, a man of 49 years, did well after the operation; a rectal fistula that formed from sloughing spontaneously closed.

Until he had looked this afternoon into Eve's "Surgical Cases," Dr. Weir was under the impression that the stone exhibited was the largest that had successfully been removed entire in this country by the perineal section. But he found in that work a record of a calculus removed by Dr. Mettauer, of Virginia, weighing sixteen ounces, with recovery of the patient. Abroad, Mr. Hadmer, of Norwich, England, has the credit of having in 1746 successfully extracted a stone weighing nearly fifteen ounces. Mr. Mayo, of Winchester, England, removed one of fourteen and a half ounces, but it was broken before extraction.—*Medical Record*.

ORIGIN OF YELLOW FEVER.

At the recent meeting of the American Public Health Association Dr. A. N. Bell, of New York, remarked in substance, as follows:

During my naval service in the Mexican War, and subsequently on the Gulf Coast, the Spanish Main, in the West Indies, on the coast of Africa and neighboring islands; and since, on Bay Ridge and Fort Hamilton in 1856; in charge of the floating Yellow Fever Hospital, and my connection with the New York Quarantine—at home and abroad, ashore and afloat—I have, like my friend, Dr. Dowell, seen a good deal of yellow fever, and had excellent opportunities for studying its topography in various places. And during the while I have read everything concerning it I could get hold of, but with convictions the very opposite of his. I am thoroughly of the opinion that the conditions of yellow fever are, in general, putrefying organic matter, moisture, and high temperature, and wherever these conditions combine in the greatest abundance, there yellow fever is most wont to prevail, and with the greatest degree of malignancy. And so far from having my convictions shaken in this regard by the reports we have here heard, they have been greatly strengthened. Filthy soil, foul water, foul traffic, foul vessels, and high temperature have been the prevailing conditions throughout. And under these conditions, on evidence which I feel bound to accept, I believe the disease frequently has occurred *de novo* in the United States.

Of its history on this continent, and in the West Indies, it has been contemporary with European settlement. Oviedo records a great mortality from it among Columbus's people in St. Domingo in 1494. Herrera, Ulloa, Ferreyra de Rosa, and other Spanish and Portuguese historians all make record of yellow fever in American settlements before there was any commerce between this country and Africa, or any other alleged primitive sources of this disease. And in more recent times, but yet so long ago that commercial intercourse was much more easily traced than during the last fifty years, yellow fever frequently occurred in various parts of this country, when favored by local conditions, in exceptional seasons, when it was wholly impossible to trace it to foreign origin, and under similar circumstances I hold it is continually liable to occur.

All efforts at freezing out infected ships hitherto have failed. The cold cannot be made to penetrate into the bilge, the timbers, and crevices, the places in which lodge the deposits of soakage from the filthy waters of foul harbors in hot climates. Moreover, it is the common practice of the navy, in sending infected vessels to cold climates, to have them hooded over, and the depth of the hold and the housed-in conditions are such as to preclude the possibility of a freezing temperature where it is especially needed. Dr. Bell expressed his continued faith in steam heat as a disinfectant for ships, and his surprise that it had not been used on board the ill-fated *Porter*. The fear of moisture on account of condensation of the steam, he says, is a fallacy; the surfaces thus subjected to steam become so heated that, immediately on opening the hatches, the moisture is dispelled with great rapidity and completely. Of the degree of heat necessary to kill yellow fever, he considers steam heat of 180 degrees for two or three hours amply sufficient. Dr. Bell here related his first observation in the use of steam with the effect of disinfection in 1848. The United States steamer *Vixen*, while infected with yellow fever, was steamed for the purpose of killing cockroaches. The result was twofold, the death of the vermin, and non-recurrence of the fever. Since that time it had frequently been used by himself and others for the special purpose of disinfection, and, so far as he knew, without failure in any instance.

PHILADELPHIA HOSPITAL.

Clinic of DR. F. F. MAURY—Reported by Dr. C. W. Dulles.

SINUS OF THE LEG.

ON the inner aspect of this young man's leg you see two openings, with purplish, unhealthy-looking margins, from which a small amount of semi-purulent matter can be pressed. The origin of this trouble he associates with a gunshot injury, and it has now lasted a long while.

The appearance of the openings would lead us to suspect—especially in this location—that they communicate with dead bone. If this be the case we must remove it; if not, if we have but a sinus here, a free incision will enable us to ascertain this, and also put it in the best condition for healing.

We begin by applying Esmarch's bandage. This consists of a roller of rubber, which is applied tight, and without reverses, from the very extremity of a limb to a point above where an operation is to be performed; and a piece of rubber tubing, which is drawn very firmly about the limb several times and fastened just above the last turn of the roller, which is then removed from this point downward. The