the gentlest manipulation in a necessary element in this sort of treatment.

Hypertrophy of the prostate may also be treated either by electrolysis or by the galvano-cautery. The electrolytic treatment of this affection is the same as that for stricture of the urethra. An insulated bougie-shaped electrode, connected with the negative pole, should be passed through the urethra and its end allowed to rest against the enlarged gland. A current of 5 ma. is then allowed to pass for twenty minutes. The séance can be repeated every ten days.

The use of galvano-cauterization forms a part of Bottini's operation for hypertrophic prostates. The object of this operation is to cauterize and thus divide the prostate. For this purpose Newman's cautery electrode is considered one of the best on the market (Fig. 1848). Tripier advises faradization for hypertrophy of the prostate. The procedure should be carried out in the following manner: An insulated sound is to be introduced into the urethra and a double bulbous electrode into the rectum, and then, after the current has been turned on, the latter is to be pressed against the prostate.

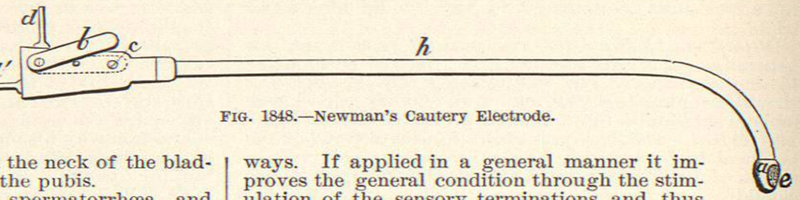

FIG. 1848.—Newman's Cautery Electrode.

Nocturnal incontinence of urine is also benefited by electricity, good results being obtained by the use of either faradism or galvanism. One electrode should be introduced into the urethra and placed against the neck of the bladder, while the other is placed over the pubis.

Involuntary seminal emissions, spermatorrhœa, and impotence are also affections which can be ameliorated or removed by the same method of treatment.

Under these circumstances the cathode should be introduced into the urethra and made to rest against the openings of the seminal ducts, while the anode is placed upon the perineum. In impotence it may be well to add, to the procedure just described, galvanization of the spine and also applications of the faradic brush to the penis and scrotum. It seems proper to state here that two electrical instruments, already described in other parts of the HANDBOOK (Figs. 1570 to 1573 inclusive in the present volume), have been devised for the purpose of facilitating both the diagnosis and the treatment of diseases of the genito-urinary tract. I refer to the urethroscope and the cystocope.

GOUT AND RHEUMATISM.—In these affections, which are associated with chronic inflammatory conditions of the joints and with degenerative changes, electrical baths (see above) are indicated. The baths may be either general, if several joints are affected simultaneously, or local, if only one or two joints of a limb are involved. In the last case the affected member is placed in the bath, one pole of the battery is connected by a wire with a metallic vessel submerged in the water of the bath, and the other pole is placed on an indifferent part of the patient's body.

If with the diseased joint is associated muscular atrophy—which, in fact, often occurs—a local faradization of the muscles should be added to the treatment of the joint. Besides the baths direct faradization or galvanization of the joints is of great utility. Stabile unipolar currents, with the anode over the spinal origin of the nerves supplying the joint and the cathode over the joint itself, give good results. Bipolar applications are equally useful. When the faradic current is used, the higher its tension the greater appear to be its analgesic properties. In bipolar treatment the electrodes are placed on both sides of the articulation through which the electrical current passes. At the International Medical Congress of Berlin in 1890 Edison's experiments on the treatment of gout were reported by Bayles; it was demonstrated that the gouty concretions are removed by cataphoresis (electric endosmosis). Good results were obtained by connecting the anti-gouty or the anti-rheumatic drugs with the anode and then directly applying them to the affected joints. The much-desired metabolism, of transforming uric acid into urea, was obtained. The tophi, which in gout are composed of urate of soda, are removed by galvanism, and particularly by the employment of the positive pole; the urates are split at the negative pole.

Muscular rheumatism, lumbago, and rheumatic torticollis may be treated by both galvanic and faradic currents. The method of application is the usual one. Bipolar faradic applications, strong enough to produce vigorous muscular contractions, are the best adapted for the relief of stiffness and spasm. The galvanic current, on the other hand, is more efficacious in relieving pain. The faradic brush also often affords relief in this class of cases. In muscular rheumatism static electricity, as a rule, affords no relief, but the static induction current, with its infinitely rapid succession of sparks, has the character of a faradic current of high tension and, as we mentioned above, it is likely to give relief for a long time.

DISEASES OF THE SKIN.—In the treatment of diseases of the skin electricity may be utilized in two different ways. If applied in a general manner it improves the general condition through the stimulation of the sensory terminations, and thus improves the trophic condition of the skin; while if applied locally it removes many uncomfortable symptoms, such as pain, pruritus, hyperæsthesia. Electricity may also produce a caustic effect upon the skin, by depositing acids and alkalies on its free surface. For the production of a general effect, all the three varieties of electricity, static, faradic, and galvanic, may be utilized.

Static electricity is recognized as one of the greatest stimulants of metabolism, and at the same time one of the ideal cutaneous stimulants and sedatives. Faradic electricity acts as a stimulant. The galvanic current produces a sedative effect if a mild current (about 3 ma.) is applied continuously for five minutes. Care should be taken that the skin be slightly reddened; otherwise there may be electrolytic action followed by destruction of the skin. During the operation there should be no interruption of the current. The galvanic current, if applied in sufficient strength, can be used as a counter-irritant. The principle of cataphoresis, *i.e.*, the property of the galvanic current to carry drugs under the skin for absorption, can be utilized in diseases of the skin. The anode should be saturated with the desired drug and applied to the spot where the action of the drug is expected. This method is particularly useful in parasitic affections of the skin; the positive electrode being impregnated with the parasiticide solution and placed over the diseased area. That mercury passes through the skin by this procedure was proven by Gärtner (*Rev. d'Electrothérapie*, 1892). Gautier (*Rev. d'Electrothérapie*, 1891) has proved it for copper, and has applied this treatment in lupus, actinomycosis, and sycosis. Copper needles connected with the positive pole are thrust into the diseased spots; during the passage of the current the copper becomes dissolved and forms, with the oxygen and chlorine of the tissues, an oxychloride of copper, which is highly antiseptic and caustic. The galvano-cautery is utilized for the destruction of diseased tissues, and can therefore be applied in pathological conditions of the skin. Electrolysis is of more use. The tissues are destroyed by an alkali or an acid, whether we use the negative or the positive pole. Acids liberated on the positive pole coagulate the albumen, thus protecting the surrounding tissue from the freed acid. The cathode liberates alkali, which does not coagulate albumen, but acts as a destructive agent. The practical application of this principle in diseases of the skin is evident. A point

to be considered is, that the electrode which produces the desired action upon the skin should be a needle and well insulated. The positive pole should be of platinum or gold, because other metals, through undergoing oxidation, leave an indelible stain on the skin. Electrolysis is particularly useful in acne, furuncle, carbuncle, lupus, and epithelioma.

ANEURISMS.—In the treatment of the thoracic and subclavian aneurisms in which medicinal aid fails to effect a cure, electricity has been tried with a fair proportion of good results. The employment of electricity in the treatment of aneurisms is based on the fact that a galvanic current passing through the blood coagulates it, through electrolysis. A clotting occurs around the poles, and then subsequently a further coagulation takes place and fibrin is deposited around the primitive clot. Ciniselli treated twenty-three cases, six of which recovered. He operated with needles connected with both poles and introduced into the aneurismal sac; every five minutes he reversed the current. Tripier and others advocate the insertion only of the positive pole, on account of its power to coagulate albumen. Stewart reports good results with continuous currents; the anode being introduced into the sac, and the cathode placed on the abdomen. The strength of the current may be gradually increased up to as high as 70 ma., but one should commence with 20 ma. Each séance should last about half an hour. Petit ("Dictionnaire Enyclopédique") treated 114 cases of aortic aneurism with electrolysis; 69 were improved.

Aneurisms of the extremities were completely cured. Whether the positive pole should be inserted into the sac, or the negative, or both at the same time, as some authors advise, is a matter which has not been fully determined; but one should always bear in mind that hemorrhagic inflammation of the sac, with suppuration and embolism, may occur. In those cases in which the operation proves successful, the tumor hardens and shrinks. *Alfred Gordon.*

ELECTROTONUS.—If a constant battery current flows continuously through a muscle or a nerve, it will so alter the chemico-physical condition of the living substance that its physiological properties will be greatly modified. The modifications produced by the flow of the current were first carefully studied by DuBois-Reymond, who gave the name "electrotonus" to the changed condition. The alterations produced are in general of opposite kinds at the anode, the place where the current enters, and the cathode, the place where the current leaves the tissue; therefore we speak of anelectrotonic and catelectrotonic effects of the current. Where the tissue is under the influence of the anode, is in a state of anelectrotonus, the irritability and conductivity are decreased or even absent; where the tissue is under the influence of the cathode, is in a state of catelectrotonus, the irritability and conductivity tend to be enhanced. These alterations of physiological activity are accompanied by changes in the electrical condition in the vicinity of the two poles, changes which are revealed by the so-called "electrotonic currents."

In the case of muscle, the alterations produced by the current are chiefly localized at the points to which the electrodes are applied; in the case of nerves the change spreads not only throughout the region between the electrodes, the intrapolar region, but in both directions beyond the part directly exposed to the current, the extrapolar regions. Finally, it must be stated that the current not only influences the condition of the nerve and muscle during the time it is flowing, but leaves behind it important after-effects, these being in general the reverse of those observed at the poles during the flow.

The causes of the physiological changes which result from the passage of the current are to be sought in the chemico-physical changes which it produces in the living substance. The flow of the current causes, through electrolysis, the liberation of ions, which in turn produce the polarization phenomena observed. These polarization phenomena are without doubt closely related to the changes in irritability and conductivity, and to the excitation effects produced by the polarizing battery current.

The above facts have been ascertained chiefly through the study of isolated nerves and muscles of animals. There is reason to believe, however, that they hold good for the nerves and muscles of man, although necessarily modified by the spread of the current through the fluids which normally surround these structures.

Effects of the Constant Current upon Irritability and Conductivity of Nerves.—Many of the phenomena referred to by the earlier writers under the title of "galvanism" were of electrotonic nature, but most of the accounts are too vague or the data are too incomplete to make the statements of any scientific value. According to Pflüger, the first trustworthy observation which bears directly on the effect of the galvanic current on irritability and conductivity was reported by "that indefatigable experimenter, Ritter" (Gilbert's *Annal. d. Physik*, Bd. vii., S. 477–483). Ritter stated that he remained connected with a battery by his hands for half an hour, and that the hand and arm on the silver side of the battery (negative pole) became stiffened, and gradually the power to move that hand lessened, while his control over the hand connected with the zinc side (positive) increased. Toward the end of the experiment he had ceased to receive any direct sensations of a type to remind him that he was connected with the battery. Ritter's philosophical interpretation of these effects need not be considered, for his results may be explained in the light of the facts which have been ascertained by scientific study of the effects of battery currents on animal tissues.

Pflüger gives the following explanation: On account of the wide spread of the current through the fluids of the tissues of the trunk, we can think of the current ascending one arm, leaving it at the shoulder to spread through the body, then entering the other arm, descending through it, and leaving it at the hand; thus the first arm has an anode at the hand and a cathode at the shoulder, and the other arm has an anode at the shoulder and a cathode at the hand. Experiments on isolated nerves show that exciting a nerve above a descending current excites less than exciting it above an ascending current, and Ritter's observation is in harmony with this result, and is more interesting because in his case the irritant was the normal voluntary impulse. Ritter ("Beiträge zur näheren Kenntniss des Galvanismus," etc., Jena, 1802; Gehlen's *Journal f., d. Chem. Phys., u. Mineral.*, vi., S. 421, 1808) made other interesting observations of fundamental importance. One of these was that the effect of the current on the nerve increases with the time of closure, this being revealed by the modifications of irritability observed when the current is opened. Another observation was that the modifications produced in the nerve by the current may not be limited to the region subjected to the current, but may spread with opposite sign along the nerve toward the muscle, as depression of irritability where there is an ascending, and elevation of irritability where there is a descending current, what we now recognize as the anelectrotonic and catelectrotonic effects.

Twenty years later another discovery having an important bearing upon our question was reported by the physicist Nobili (*Annal. de Chimie et de Physique*, p. 30, 1830). He saw a frog preparation, which had entered into tetanus from some unknown cause, become quiet when a battery current was passed through it. He explained the result as due to a change produced by the current—this change preventing the transmission of the excitation process. He even went so far as to recommend the use of the constant current to the physician as a means of arresting tetanus.

This subject was studied by Matteucci (Compt. rend., vi., 680, 1838) and others, but the first to do really careful work upon it was Valentin ("Lehrbuch d. Physiol. des Menschen," ii., 2, S. 655). He excited a nerve at a distance from the muscle with an induction current and noted the height of the contraction; then he sent through a part of the nerve, close to the muscle, a constant current, and saw the contraction of the muscle lessen or altogether fail; finally he removed the constant current, and on exciting with the induction current again, saw the muscle contract. The result of this experiment was to show that the nerve could be the seat of the inhibition. Valentin found in addition that excitation might fail when the irritant was applied to the region between the part of the nerve subjected to the battery current and the muscle; but he observed that this occurred only when the ascending, not the descending, current was used.

The next to investigate these questions was Eckhard ("Der galvanische Strom als Hinderniss der Muskelzuckung"; Henle and Pfeuffer, *Zeitschr. f. rat. Med.*, N. F., Bd. iii., S. 198). He corroborated Valentin's statement that a constant current flowing through a nerve makes it impassable for an irritation developed in it higher up; and he proved that this was true for mechanical and chemical as well as for electrical stimuli. Eckhard (*Beiträge z. Anat. u. Physiol.*, Heft i., S. 25, 1855) also observed, like Valentin, that the ascending current can lessen the excitability between the positive electrode and the muscle, and found, in addition, that the descending current can increase the excitability of the nerve between the negative electrode and the muscle. This was observed to be true when chemical stimuli were used. He failed to find the increased irritability which occurs near the cathode when the current is ascending.

Although the work of his predecessors had revealed many of the more important effects of the flow of a constant galvanic current through a nerve, we are indebted to Pflüger for a critical review of the field, and for the disentangling of apparently conflicting results. He devised exact methods for grading the strength of the polarizing current, for securing a constant strength of stimulation, and for recording the height of the muscular contractions which he used as the test of the strength of the excitation developed in and transmitted by the nerve. With the help of these methods he was enabled to distinguish more accurately than had been done the effects of the polarizing current on conductivity and on excitability. He sums up the results of his studies on the effect of the polarizing current on the irritability of the nerve when it is excited by an induced current as follows ("Unters. ü. d. Physiol. d. Electrotonus," S. 47, Berlin, 1859):

I. We send a constant descending current through a stretch of nerve near to the gastrocnemius muscle and lay the electrodes of the induction circuit near the positive electrode and between this and the central cut end of the sciatic nerve. A descending induction current now causes a weaker contraction when the nerve is polarized, a stronger when it finds itself in the normal condition.

II. The constant descending current flows through a stretch of the nerve near the cut end, and the irritating descending induction current strikes the nerve in the vicinity of the negative electrode and between this and the muscle. The contractions now appear stronger than when the constant current does not flow through the nerve.

III. The constant ascending current flows through a stretch of the nerve near the gastrocnemius muscle, and an ascending induction shock strikes the nerve in the neighborhood of the negative electrode and between this and the central cut end. While the constant current flows, the contractions are larger than when this is not the case.

IV. The constant ascending current flows through a stretch of nerve in the vicinity of the cut end, and an ascending induction shock strikes the nerve near the positive electrode and between this and the muscle. While the constant current flows, the contractions are weaker than when this is not the case.

If the strength of the current surpassed a certain amount, inhibitory effects on the conduction power of the nerve, like those described by Valentin and Eckhard, were seen.

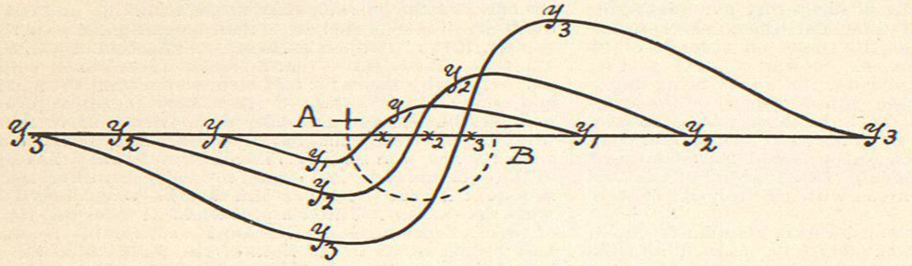

FIG. 1849.—Effect of a Constant Battery Current on the Irritability of a Nerve. The nerve being taken as the abscissa, positive ordinates represent increased and negative decreased irritability. *A*, Shows the point where the current enters; *B*, where it leaves the nerve. Curve *y 1*, shows the irritability caused in different parts of the nerve during the flow of a weak current; *y 2*, by a medium current; *y 3*, by the strongest current.

Thus Pflüger found that the excitability of the nerve in the extrapolar regions was decreased near the anode and increased near the cathode, both when the polarizing current was ascending and descending, and in the region central as well as peripheral to the part subjected to the current. In short, the irritability of the nerve during the flow of the current is decreased in anelectrotonus and increased in catelectrotonus.

Pflüger also observed, by the use of chemical stimuli, that the irritability is altered in the intrapolar regions. Since the irritability is here, as in the extrapolar regions, decreased at the side of the anode and increased at the side of the cathode, there is an indifferent point at some place between them where these effects neutralize each other.

Pflüger found that as the polarizing current is strengthened the anodic depressing influence predominates more and more and the indifferent point shifts toward the cathode. He gives the following scheme (Fig. 1849), to illustrate the alteration of the irritability of the nerve in electrotonus by different strengths of battery current.

Although the most striking effect of the cathode is to increase the irritability of the nerve, a number of observers* have reported that a strong current, if allowed to flow for a considerable time, may cause a subsequent depression of the irritability. This fall of irritability in the region of the cathode has generally been attributed to a spread of the condition of decreased irritability at the anode into the region of the cathode. The indifferent point is said to shift, as the current is strengthened, toward the cathode, until finally the cathodic region is invaded and the irritability is depressed beneath the cathode. Results obtained by Werigo (Pflüger's *Archiv*, xxxi., S. 417, 1883; *ibid.*, lxxxiv., S. 547, 1901), and confirmed by the experiments of Burker (Pflüger's *Archiv*, lxxxi., 1890) throw doubt on the usually accepted explanation. According to Werigo, the fall of irritability at the cathode

* Hermann (Pflüger's Archiv, vii., S. 354, 1873; *ibid.*, x., S. 226, 1875), Gruenhagen (Pflüger's Archiv, iv., 1871), Tigerstedt ("Mitth. a. d. physiol. Lab. d. Carolin. Institut. in Stockholm," Bd. i., 1875), who used mechanical excitations for the intrapolar region, Zanetowski ("Sitzbr. d. k. Akad. d. Wiss. in Wien, Math. Phys. Cl.," Bd. cvi., Abthl. 3, S. 185, 1897), Lhotak v. Lhota (Bull. internat. d. l'Acad. d. Sc. d. Bohème), Hermann and Tschitschkin (Pflüger's Archiv, lxxviii., S. 53, 1899), and Gotch (Schaefer's "Textbook of Physiology," ii., p. 495, 1900).

is not the result of anodic influence, but is an effect produced by the cathode. The first effect of the closure of the current is to heighten the irritability at the cathode, and this condition of heightened irritability extends from there with lessening intensity in both directions along the nerve; this condition of increased irritability soon gives place, however, to a decrease of irritability immediately beneath the cathode, the irritability in the intrapolar and extrapolar regions to either side of it remaining high. If the current is long-continued, the cathodic decrease of irritability spreads along the nerve to either side of the pole.

The changes in irritability which take place when a battery current is put into a nerve begin immediately. We shall consider this question later, in connection with electrotonic currents.

After-Effect of the Current.—In the early days of galvanism it was observed that when the current is withdrawn from a nerve it leaves it in an altered state. The first observations related to the excitation phenomena accompanying the opening of the current. The opening contraction was seen first by Valli and Fowler (Reinhold's "Geschichte des Galvanismus," u.s.w., S. 35, 1792), the opening flash by Rutherford, and the opening sensation by Robinson (Al. Monro's and Richard Fowler's "Abhandlung," S. 57, 1793). Both Volta ("Collezione dell' Opere," T. ii., p. 11; letter to Banks "Memoria sully Idendita," p. 219) and Pfaff ("Ueber thierische Electricität u. Reizbarkeit," S. 76) failed to recognize the true significance of the opening contraction, referring it to changes occurring in the battery circuit at the instant it was broken. Ritter ("Beiträge z. näheren Kenntniss d. Galvanismus," Stuck. i., S. 78, 1802) attributed it to an effect left in the organism, saying that the instant the battery circuit was broken its influence must cease. This view was supported by Ermann (Gilbert's *Annalen d. Physik*, xxiii., S. 30, 1806) and Dumas ("Traité experimental," T. iv., S. 968, p. 284, 1836) and has been generally accepted. Ritter's view is favored by the fact that the opening tetanus observed by him with the ascending current is the greater the longer the current lasts (Ritter, "Beweis dass ein beständiger Galvanismus den Lebensprocess in dem Thierreich begleite," S. 119–121, 1798). Pflüger ("Electrotonus," S. 72, 1859) in treating of this subject accepts Ritter's idea that the opening tetanus is due to an equalization of the alterations produced by the current in the nerve, the molecules being carried back to normal position by internal forces. He points out, however, that the visible excitatory phenomena are only the outward expression of changes produced in the nerve by the current, and that the current leaves behind it alterations which manifest themselves in a change of the irritability. In general at all points where the irritability is raised during the flow it is lessened just after its removal and vice versa. Pflüger ("Electrotonus," S. 274) states that the fall at the cathode is of short duration, however, and is followed by a second rise, while the rise at the anode lasts for a considerable period. The decline of excitability at the cathode when the current has been strong is of so short duration that, according to Obernier (*Archiv f. Anat. u. Physiol.*, S. 269, 1861), it may be difficult to detect it. Werigo (Pflüger's *Archiv*, lxxxiv., S. 547, 1901) states that the after-effect of the current depends more upon the duration of flow than upon the strength of the current. If the flow is of short duration the recovery is very rapid; if it is prolonged, a condition of decreased irritability may last for a long time. A reversal of the current, making the former anodic region cathodic, hastens the return of the irritability to the normal.

Effect of the Constant Current on the Conductivity of the Nerve.—Pflüger ("Electrotonus," S. 48) found, like Valentin and Eckhard, that if the current surpasses a certain strength, it has an inhibiting effect on the conduction power of the nerve. To demonstrate it, it is only necessary to excite the nerve by a feeble stimulus applied to the central end of the nerve of a nerve-muscle preparation, and then let a battery current flow in either direction through the part of the nerve between the excited point and the muscle. The flow of the current lessens the conductivity of the nerve in the region of the anode and the muscle fails to be excited. This block at the anode is thought to be associated with the lessened excitability of this region by those who regard the conduction process to be due to the successive stimulations of succeeding points of the nerve. After the removal of the current there is, for a short time, a block in the region of the cathode corresponding to the decreased irritability in this region. Like the decrease in irritability, the decrease in conductivity is greater the stronger the battery current and the longer the closure. The lessening of conductivity during the closure and just after the opening of the battery current explains the third stage of Pflüger's law of contraction. If the current is strong and the anode be nearest the muscle, the excitation developed at the cathode on the closure of the current fails to be transmitted; and if the cathode is next to the muscle, the excitation developed at the anode at the opening is prevented from reaching the muscle. This experiment shows that the change in conductivity, like the alteration of irritability, begins immediately.

Not only is the power to conduct lessened during the flow of the current, but von Bezold ("Electr. Erreg. d. Nerven u. Muskeln," Leipzig, 1861) has shown that the conduction rate is slowed. This result has been corroborated by the work of Rutherford (*Jour. of Anat. and Physiol.*, ii., p. 87, 1867) and Gotch (Schaefer's "Textbook of Physiol.," ii., p. 502, 1900), who also found that with weak currents of short duration the conductivity is quickened at the cathode. We should expect to find the conductivity at the cathode to be lessened during the flow of the current, if it is strong and long-continued (Werigo, Pflüger's *Archiv*, lxxxiv. S. 547, 1901).

Electrotonus in Human Nerves and Muscles.—Electrotonic phenomena in man are of great interest not only because of their theoretical import, but because of their bearing upon diagnosis and therapeutics. Unfortunately the conditions under which the nerves and muscles exist in the normal man are such as to make exact experimentation impossible. In spite of the difficulties which exist, it has been ascertained that the voltaic current has the same effect upon the nerves and muscles of men as upon those of the frog and the higher animals.

In studying the effect of the battery current on the nerves of man one has to resort to the unipolar method, recommended by Chauveau (Compt. rend., lxxxi., p. 779, 824, 1875; lxxxii., p. 73, 1876). By this method, a large electrode is placed over some indifferent part of the body, and a small electrode is put directly over the part to be subjected to the current. The position of this electrode does not accurately mark the point at which the current will enter and leave the nerve because the current spreads as it enters the moist tissues beneath the electrode.

Hermann ("Handbuch d. Physiol.," Bd. ii., Abth. 1, S. 62, 1879) states that one can never be sure of the direction which the threads of the current will take in the nerve. If the exciting electrode is the anode, it will frequently happen that there is a catelectrotonic region above and below the point of application of the electrode. Moreover, because of its spread through the fluids about the nerve, the current does not enter and leave the nerve at two definite places, but there are formed, beneath the physical anode, the leading-in electrode, and beneath the physical cathode, the leading-out electrode, many physiological anodes and cathodes. It is at these physiological anodes and cathodes, the places where the current enters and leaves the nerve, that its anelectrotonic and catelectrotonic effects are produced. The position and number of these physiological poles will of course be different in each experiment.

It is not strange that working under such variable conditions different observers have arrived at contradictory results.

Fick ("Medicin. Physik," S. 377, 1866) tried by applying the current to the ulnar nerve at the elbow to get