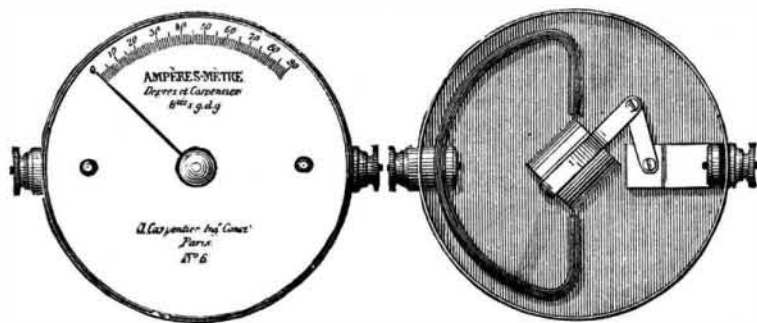


it creates new molecular intervals, and consequently facilitates the formation of the plates, considerably shortening its duration. In fact, the secondary couples thus treated can furnish, after three or four changes in the direction of the primary current, discharges of long duration, while without the previous action of the nitric acid, it could only give the same results after several months' formation.

Accumulators prepared by this method seem, therefore, to present at once the advantages of couples of lead plates; that is to say, a good adherence of the deposits and the absence of the felt which maintains the minium upon the plates of the Faure couples, and at the same time the advantage peculiar hitherto to the Faure couples; that is to say, a rapid formation—a condition indispensable with accumulators intended for industrial application. It would be interesting to make new and careful comparisons between the last models of M. Faure and the new apparatus of rapid formation of M. Planté, as much from the point of view of rapidity of formation as of capacity of storage and of their effective duration in continual service.

#### DEPREZ & CARPENTIER'S VOLTMETER AND AMPEREMETER.

INDUSTRIAL needs are, as regards electric measurements especially, very different from those of science. An apparatus placed in a workshop, to be put into the hands of every one, should, before everything else, be simple, plain, and of low price. Its exactness has no need of reaching the fifth decimal, and, in most cases, it is only necessary that it shall give, to near a unit, the extent of the quantities to be measured. It is with such an idea in view that have been constructed Messrs. Deprez & Carpentier's *voltmeter* and *amperemeter*. The first of these indicates the difference of potential between the two points of a circuit, and is branched on to a *derived circuit*; while the second indicates the intensity of the current, and is placed on the circuit itself. The two apparatus differ only in the size of the wire of the bobbin, which is formed of very fine wire in the voltmeter and very coarse in the amperemeter. The modification introduced into Deprez's galvanometer by Mr. Carpentier



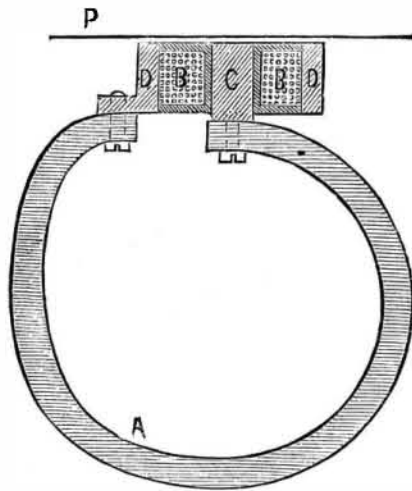
DEPREZ & CARPENTIER'S AMPEREMETER.

consists in placing the bobbin *obliquely* in the magnetic field formed by the directing magnet of the needle. The deviation of the galvanometric helix has the effect of doubling the graduation and the angle of deviation in one direction for a given intensity, and of annulling it in another. It is necessary, then, that the current shall always traverse the apparatus in the same direction in order to deviate the index in the direction of the hands of a watch, when the apparatus is examined on the side that carries the graduated face. The index is formed of a simple horse-hair, and the whole apparatus is inclosed in a round brass case 8 to 10 centimeters in diameter, thus giving it externally the appearance of an aneroid barometer. With two of these apparatus fixed on a machine, it is easy to follow the variations in electromotive force and in the intensity of the current, and to deduce therefrom the electric energy expended in the external circuit. As the apparatus is asymmetrical, the deviations are not accurately proportional to the intensities in the amperemeter, or to the electromotive forces in the voltmeter; but this defect is corrected by the use of a reduction table that accompanies each apparatus, and the advantage is preserved of having a wider, and consequently a more precise graduation that permits of very easily estimating the semi-emper or semi-volt, an approximation quite sufficient in practice. The accompanying figure, which gives a top and bottom view of the apparatus (the bottom of the case removed), will give a very good idea of its very simple arrangements.—*L'Electricien*.

#### M. A. D'ARSONVAL'S TELEPHONE, WITH CIRCULAR MAGNETIC FIELD.

THIS new form of magnetic telephone was presented by the inventor at the sitting of the French Physical Society on the 21st of July. M. d'Arsonval was led to adopt this arrangement by studying the effect produced by a wire traversed by an electric current on a double pole telephone (of the Gower, Siemens, or Ader type), without coils. Placing the wire in every position between the poles, internally, laterally, etc., he found, as might be expected, that the maximum of effect is obtained when the wire is in that position where the magnetic field is greatest, i. e., between the two poles of the magnet. It is in order to increase the useful part of the wire, which is placed between the arms of the magnet, that the Gower and Ader telephones are furnished with flattened poles. M. d'Arsonval asked himself whether, with a suitable method of coiling, it would not be possible to suppress entirely the outer part of the wire, which introduces into the circuit a supplementary resistance without much useful effect of importance. He effected this by constructing a telephone with circular magnetic field, similar to Nickles' electromagnets. The apparatus shown in the accompanying diagram resembles in its outward form an Ader telephone. The bent magnet, A, forms a handle; on one of the poles is fixed a cylindrical core, C, of soft iron, on the other a ring of soft iron, D, inclosing the first; the coil, B, is placed in the annular space which is left free between these two circular poles. The magnetic field is thus concentrated into the space occupied by the coil, and the lines of force are turned into a direction perpendicular to the wire of the coil. When the telephone is employed as a transmitter, the movements of the plate, P, produce a sort of pivoting of the lines of force, which gives rise to induction currents. When the telephone is employed as a receiver the undulatory currents which traverse the coil produce a maximum of effect, since they act in that part where

the magnetic field is most intense; the modification which they bring to bear on the continuation of the lines of force react upon the plate and make it vibrate. With much less weight and a much shorter wire—M. d'Arsonval's telephone weighs 125 grammes, and has only 20 ohms of resistance—we obtain effects as powerful as those produced by the Gower telephone, but with more clearness.



D'ARSONVAL'S TELEPHONE.

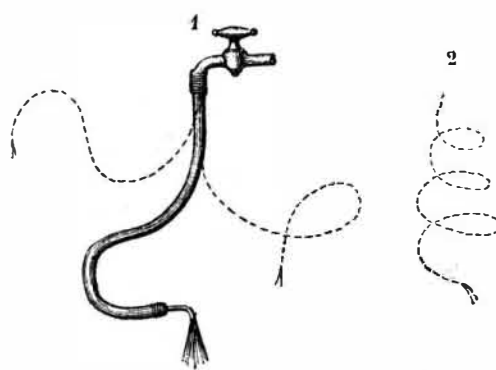
The Gower telephone being furnished with an ear-piece, produces a sound like that heard in a sea-shell, which M. d'Arsonval attributes partly to the too great diameter of the tube, and partly to the spiral of metallic wire placed in the tube in order to prevent its becoming flattened. M. d'Arsonval has obviated this difficulty by using a simple tube of gutta percha eight millimeters (one third of an inch) in dia-

meter, and thus all resonance is destroyed. It is advantageous in practice to arrange a double tube, one for speaking, and the other for hearing.

#### AN EXPERIMENT IN HYDRAULICS.

A FRENCH professor of physics sends to our contemporary, *La Nature*, the following description of a simple experiment, which may be added to those already published in previous numbers of this journal under the caption of "Physics without Apparatus."

A piece of rubber tubing (it is better that it should be old, so as to be quite flexible) is adapted to a water faucet, and to its free extremity there is affixed a glass tube which is bent so as to form a more or less acute angle. On turning



EXPERIMENT IN HYDRAULICS.

on the faucet the reaction of the water on the tubing displaces it; but, owing to the elasticity of the rubber the direction of the force changes very rapidly, so as to cause the tubing to undergo the strangest and most varied motions, some of which are shown in the dotted lines in the annexed cut. If the rubber employed is very thin the motions become still more complicated; and, in this case, it is not necessary to employ the glass tube at the extremity of the rubber tubing, provided the pressure of water be properly regulated.

#### ELECTRO-METALLURGIC PROCESS OF MM. BLAS AND MIEST.

THE authors have established the novel fact that if in electrolysis we replace the metal of the anode by sulphurated ores in a state of compression, the latter may serve themselves as anodes. Further, if we place such anodes in a bath of a suitable electrolytic salt, of the same metallic base as the metal of the ore, and let the electric current act in the bath, the result is that all the sulphur of the ore is precipitated upon the anode, and falls from thence to the bottom of the bath. In the meantime there is formed upon the cathode a deposit or precipitate of metal liberated from the salt, which forms the electrolytic bath. On the other hand, the acid of the bath, in proportion as it is set free, appropriates an equivalent proportion of the metal contained in the ore placed at the anode. In this manner the neutral electrolytic bath is reconstituted without ceasing and serves indefinitely.

#### ON THE USE OF CERTAIN INSTRUMENTS IN THE TREATMENT OF SKIN DISEASES.\*

By GEORGE HENRY FOX, M.D.

THE treatment of skin diseases was formerly considered to lie within the domain of surgery, and external measures were chiefly relied upon for their cure. It is only within recent years that the internal origin of many skin diseases has become thoroughly appreciated, and to-day dermatology is justly considered to be simply a branch of general medicine. There are certain diseases, however, which require surgical treatment, and to these and a few simple instruments which are commonly employed by dermatologists I will invite your attention to-day. Of cancer in its various forms, and other malignant affections involving the skin and requiring removal with the knife, I will not speak, since these naturally come under the notice of the surgeon. There are certain special instruments, however, which are solely used in the treatment of skin affections which it may be well for you to possess, and which, I hope, you will have frequent occasion to use.

The first and simplest of these is a short silver tube, with a caliber about the size of a fine knitting needle, which I term the comedo-presser or extractor. The end of this should be carefully rounded so that it will not scratch or otherwise injure the skin. In many cases of comedo, occurring alone or associated with acne, this little instrument will be found to be almost indispensable. You know it is a very common custom for patients suffering from acne to press out the little black-heads, as they are termed, either by means of the thumb-nail or an ordinary watch-key. The watch-key commonly answers the purpose; but, as the hole is square instead of round, and the end is often rough, delicate skins are not infrequently caused to suffer from its use. A number of small instruments have been suggested as substitutes for the watch-key, but a silver tube I have found to be of the greatest value.

We have before us a young woman with pustular acne. Interspersed among the small papules and pustules are numerous projecting black specks which you will recognize as comedos or comedones. As inflammation of the sebaceous glands, which is the essence of acne, is very apt to be excited by the presence of this inspissated sebum in the ducts of the glands, one of the first steps in the treatment of this case will be to remove these fatty plugs; by carefully applying the end of the tube over the black dot and giving it a quick, sharp pressure, the comedo is expressed from the duct with the greatest of ease and commonly with no pain. It is not a pleasant operation, to be sure, and you will find some patients who will wince under this treatment. When the comedos are very dry and hard, it may be found advisable to have the patient steam the face before using the instrument. This can easily be done by placing the patient's face over a vessel of boiling water for a few minutes, the head being covered by a towel. There is always a tendency for the ducts to refill after evacuation; but if the skin is stimulated by the daily use of soap, the glands will soon resume their natural action. You will notice that the use of this instrument produces a small red spot wherever it has been applied, showing that the skin is in an irritable condition. In some cases you will find the skin so irritable that this simple operation of pressing out the comedo will produce a small whitish lump or wheal similar to that which follows the bite of a mosquito. Where this irritability of the skin exists in a case of acne, you may depend upon it that there is dyspepsia or some underlying condition which aggravates the acne, and it will be impossible to effect a cure without resorting to internal treatment.

This patient tells us that the pustules occur in successive crops, and that they are specially apt to appear during the week preceding her menstruation. Most of the pustules run a rapid course and disappear in a few days or in a week's time. Occasionally deep-seated pustules are formed which do not tend to spontaneous evacuation, but produce nodules which remain for several weeks, or even longer. These give rise to a little pain at first, but soon form firm, painless tumors. The patient is often tempted to prick these large pustules with a needle, which, however, has no beneficial effect. To secure their speedy removal it is necessary to treat them as small dermic abscesses and to open them freely.

The next instrument to which I call your attention is one which is adapted to this purpose. It is, you see, a small spear-shaped lancet, with a shoulder upon either side, which presents the point from going too far into the subcutaneous tissue. If with this instrument we merely puncture the true skin, a drop or two of blood is caused to flow and the lump remains. If, however, we press it into the nodule until the shoulder reaches the surface of the skin, we generally succeed in evacuating a little pus or a small amount of cheesy matter. The wound will heal quickly under these circumstances, and the indurated nodule will be found to have disappeared. In the treatment of all cases of acne indurata a more rapid improvement can be obtained by the use of this acne lance than by any other method of treatment.

The next instrument which I show you is a small kidney-shaped knife or lancet which is used for the purpose of scarification. This instrument varies in its form, and some prefer to use a multiple scarificator, consisting of ten or twelve knives placed side by side, about a millimeter apart. A single blade, however, I think, will usually answer the purpose of scarification; and after a little experience, the parallel cuts may be made very close to each other. This instrument has been recommended for use in a number of skin affections; but the one in which I have found it most serviceable is the tubercular or ulcerated form of lupus, especially when this affects the nose or a part in which loss of tissue is extremely undesirable. The parallel incisions create an amount of inflammation which tends to destroy the morbid cells, and to leave the healthy tissue unimpaired, which would not be the case were a caustic employed for this purpose. In a case of lupus of the cheek, the dermal curette, of which I shall presently speak, or any form of caustic, can usually be employed to advantage, and a smooth scar obtained; but when lupus affects the wings of the nose, as it is very prone to do, our object should not be simply to destroy the morbid growth but to do this with the least possible destruction of the healthy tissue. In such a case the results of scarification have proved astonishing, and a nose which seemed almost certain to be wholly or in part destroyed, has healed with a very slight amount of deformity. To use this instrument properly requires a steady and skillful hand and a certain amount of experience. The parallel incisions should be made as close to each other

\* A clinical lecture, by George Henry Fox, M.D., Clinical Professor of Diseases of the Skin in the College of Physicians and Surgeons, New York.

as possible. The hemorrhage which results can be readily checked by the use of absorbent cotton or a small piece of blotting paper. The cuts heal in a few days, when scarification may be again practiced, the incisions this time being transverse to those first made. In a bad case of ulcerated lupus of the nose, this treatment should be repeated once or twice a week for several months. Under this plan of treatment, the ulceration will assume a healthy character and heal. The morbid growth will gradually disappear, and the final result, though not quickly attained, will prove most satisfactory to both physician and patient. In certain cases of rosacea, scarification may be also employed with advantage. The parallel incisions will usually destroy the fine superficial vessels. Where the nose is considerably enlarged, however, and the cutaneous vessels are very much dilated, the treatment by scarification will generally prove of little service as compared with other methods.

Some of you may be aware that, a few years ago, an English surgeon advocated the use of linear scarification for the removal of superficial vascular naevus or wine-mark. This plan of treatment, however, apparently failed in the hands of all who tried it, save its originator, and has now been generally abandoned. I shall presently speak of a plan of treatment which, in my experience, bids fair to be the only successful method of dealing with this common and disfiguring affection.

Now let me call your attention to one of the most useful instruments in the surgical treatment of lupus and epithelioma, and one which has been recommended in the treatment of acne, sycosis psoriasis, and other skin affections. This instrument is the dermal curette—the sharp spoon of the Germans. As you see, it is a small, stout, spoon-shaped instrument, perforated by a circular hole, and resembling the bonescraper used by surgeons. The instrument may vary a great deal in size and shape, but its purpose is to gouge or dig out of the skin certain morbid growths which are found to be much softer than the normal tissues, however dense or indurated they may feel to the touch of the finger.

The cases of lupus and epithelioma which were formerly allowed to increase in size under inefficient modes of treatment, or submitted to the surgeon for complete excision by means of the knife, are now commonly removed by the use of this instrument.

Our next patient has, as you will perceive, even at a distance, a flattened growth upon the forehead, with a depressed, slightly ulcerated center, and an elevated waxy margin. This is a case of superficial epithelioma, or rodent ulcer, as it is commonly termed in England. It began six years ago as a small excrescence like a wart. It bled when scratched, and has steadily but slowly increased in size. It is painless, and in its present location would not prove serious if allowed to remain for several years more. At the same time, the patient is desirous of having it removed, and the sooner a growth of this kind is destroyed, the less disfiguring will be the resulting cicatrix. The first and principal point of treatment is to destroy thoroughly the morbid growth. This can be accomplished equally well by the knife, the curette, or by caustics of various kinds. Its removal by the curette is the simplest, quickest, and least painful method which we can adopt. A second point of treatment is to remove all the growth with the least possible destruction of healthy skin. With the curette this can easily be accomplished. Although it feels indurated and harder than the surrounding skin, we will find that this outgrowth will yield readily to the scraping which we are about to employ, while, on the other hand, it would be an extremely difficult matter to dig into the healthy fibrous corium by means of this comparatively dull instrument. The operation is not attended by much pain, and I am sure the patient can stand it without the use of an anæsthetic. You now see how readily the indurated mass can be scraped away, how slight the hemorrhage is, and how quickly we have succeeded in converting the seat of the growth into a patch of raw skin. It is possible now that we have not entirely destroyed all of the diseased cells. To make certain that there shall be no return of the growth, it will be advisable either to cauterize the raw surface, which would give the patient quite as much or more pain than the scraping, or to apply iodoform and tightly bind it upon the raw surface. The application of iodoform, which has been lately recommended in the treatment of lupus, is painless and extremely efficacious in destroying any morbid cells which may remain. It promotes a rapid cicatrization on the ulceration. We will powder the surface thickly with iodoform, cover this with a layer of absorbent cotton, and hold this tightly in place by painting it over several times with flexible collodion. Beneath this dressing the ulcer will probably heal in a fortnight, and possibly without supuration. The tubercular patches of lupus vulgaris may be successfully treated in a similar way. In Germany, the use of the curette is recommended for the treatment of acne, and I have used it successfully in one or two cases of pustular acne of unusual severity, scraping the pustules and papules relentlessly at intervals of from three to five or eight days. It is only in the severest form of acne that such a harsh plan of treatment, however, would be advisable. To treat the ordinary cases of acne which will come to you in private practice by means of the dermal curette would prove to be the quickest possible means of reducing the number of your patients.

**Removal of Hair by Electricity.**—Another important instrument for dermatological purposes, and the last one of which I shall speak, is the electrolytic needle. The use of this implies the possession of a galvanic battery, an instrument which you will doubtless have on hand for other purposes, and the number of affections in which it can be advantageously used is constantly increasing. One of the most important recent advances in dermatology is the operation for the removal of superfluous hair, the development of which reflects no little credit on American dermatology. Until recently ladies afflicted with an unwelcome growth of hair upon the face have sought relief in vain. You may now assure all such who may apply to you for advice that the growth can be readily removed.

I will now bring before you a patient with a few stiff hairs growing from a small mole upon her chin. By destroying them I will best demonstrate the method by which a moustache or beard can be permanently removed. Connected with the negative cord of a battery I have attached a fine flexible steel needle, which I carefully insert into the follicle by the side of one of these stiff hairs. Grasping the hair with the forceps held in the left hand, I will now ask my assistant to complete the circuit by applying the sponged-tipped positive electrode to the patient's cheek. Electrolytic action is now manifested around the needle by the blanching of the tissue and slight frothing, which those of you who are near will readily observe. I now make gentle traction upon the hair, which, after the

lapse of a few seconds, readily comes away, showing that the hair papilla or matrix of the hair, if I may use the expression, has been destroyed. Pulling out the hairs, or removing them by means of depilatories, is simply a palliative measure. The procedure which you have now witnessed is followed by the complete and permanent absence of hair. The ordinary cambric needles will answer the purpose, although they are more likely to leave a slight pit than the fine needle which I have employed. This operation is a tedious one, and often quite as tiring to the operator as to the patient. The hairs must be destroyed one at a time, and where there are thousands to be removed, as has been the case in several patients on whom I have operated, a considerable amount of time and patience is requisite. To my friend, Dr. Hardaway, of St. Louis, is due the credit of introducing this operation into dermatological practice.

I have already spoken of the treatment of wine-mark by scarification, and called your attention to the disappointment caused by its lack of success in my hands as in many others. I have recently employed electrolysis in the treatment of one or two cases, and succeeded in transforming a dark and unsightly purplish patch into a light pink and far less disfiguring mark. I am not yet prepared to state that wine-mark can be treated by electrolysis with a degree of success equal to that which has attended its use in the destruction of hair, but by the production of numerous minute cicatrices it is easy to improve greatly the appearance of a wine-mark; and by further experimentation with this method, I trust that the complete removal of such a mark will eventually be achieved.

Having demonstrated to you the methods by which superfluous hair may be removed from the face, an operation which is now thoroughly established, and explained to you the somewhat similar method of treating the superficial vascular naevus, an operation which is comparatively new, it remains for me to speak briefly of the value of the electrolytic needle in the removal of certain facial blemishes of lesser importance.

**Telangiectasis.**—We will begin with that dilated condition of the capillary vessels which is known as telangiectasis. This affection presents itself in a variety of forms; the most common is that which is seen upon the wings of the nose, either alone or in connection with rosacea. The dilated vessels may be of a bright red hue, or they may appear purplish and tortuous, as in the swollen nose of the drunkard. In either case they are unsightly and call for local treatment. Heretofore this has consisted in slitting up the vessel and applying nitrate of silver or perchloride of iron. More recently multiple puncture or scarification has been employed, but by far the simplest and most effective method of treatment is that recommended by Dr. Hardaway, viz., the use of the electrolytic needle. With a fine and sharp needle, connected with the negative pole of the battery, the dilated vessel is pricked at the point where it appears to emerge from the corium and make its appearance upon the surface of the skin. The circuit being now completed by touching the sponge-tipped positive electrode to the cheek, hand, or any portion of the body, the characteristic blanching is quickly observed around the needle, and in a few seconds the vessel has become white for a short distance from the needle. The object of the operation is to excite enough inflammation at a given point to cut and ligate the vessels as it were, and the number of seconds required to accomplish this end will depend upon the strength of the current, and the distance between the electrodes. Here is a well-marked case of rosacea in a man who is evidently not an advocate of total abstinence—in practice, at least. You see the swollen and tortuous venules upon the sides of the nose, slightly elevated above the level of the skin. In this case we will use twelve cells of a zinc-carbon battery, and apply the sponge to the patient's cheek. You now see the chemical action taking place in the tissue around the needle, and those of you who are near enough can see the bubbles of hydrogen coursing through the vessel and its branches, like the blood corpuscles seen beneath the microscope in the web of a frog's foot. To destroy all of these vessels upon the side of the nose, it is necessary to introduce the needle repeatedly, and allow it to remain each time from five to ten seconds.

In this next patient, a young woman who has come to the clinic on account of another skin affection, you notice upon the cheek a small, bright-red point from which a few fine tortuous vessels radiate. Its spider-like form has given to this affection the name of *naevus araneus*. The patient states that the spot made its appearance a few years ago without any known cause. Very likely it resulted from the prick of a pin or some other trifling injury. It manifests no tendency to increase in size, and gives the patient no annoyance, but still she is willing, and even anxious, to have it removed, if this can be done without much pain. I now insert the point of the needle in the center of the red spot, which naturally occasions a slight pricking sensation. The patient will now grasp the moistened sponge connected with the positive cord of the battery, and she now undoubtedly experiences a sharp, stinging sensation, which is by no means agreeable, although it is not particularly painful. You see that the redness has already disappeared, and in about a minute or two, having now removed the needle, a slight swelling will take place similar to that which usually follows a mosquito bite upon a delicate skin. The result will be a destruction of the blood-vessels and a fine punctate cicatrix, which will be unobservable except upon the closest inspection.

**Angioma.**—In one or two patients who have been partially stripped in the clinic, I have called your attention to the existence of numerous little vascular tumors of the size of a pinhead or lentil, and projecting slightly above the surface of the skin. These small angiomas are of no consequence when situated upon the body, but when, as occasionally happens, they occur upon the face, it is a very easy matter to destroy them by this simple operation.

When they are as large as a small pea, it is advisable to introduce two needles, one connected with either cord of the battery, and have their points almost touch. Angiomas of larger size (the vascular naevus described in works on surgery) can usually be successfully treated by introducing two or more gold-plated needles of larger size. A preferable plan of treatment for these vascular growths, however, and one which I hope soon to have the opportunity of demonstrating, is the application of the ethylate of sodium.

**Naevus Pigmentosus.**—Let me call your attention now to another trifling affection of the skin, which is so common that it may be found upon the skin of a large minority, if not the majority, of healthy persons. I refer to the little pigmented spots which, like permanent freckles, are so often found upon the face, the backs of the hands, and upon covered portions of the body. They are either congenital or develop in early life, and in persons of a dark complexion they may be very numerous. Usually they are not much

larger than a pin's head. I will pass around the photograph of a man who had an unusual number of these small pigmented naevi upon his arms and body. I remember this patient telling me that, although the spots never disappeared, they were much darker in summer than in winter, even upon the covered portions of the body. Such spots when not elevated above the surface of the skin occasion no annoyance whatever, except when they happen to occur upon a lady's face. Treatment now becomes an important matter, and again electrolysis comes in play. It is not necessary to insert the needle into the deeper portion of the skin, for you will remember that the pigmented deposit is situated in the cells of the epidermis just above the papillary layer of the true skin. All that is necessary is to produce a small blister upon the surface of the black spot, and by touching it repeatedly with the point of the needle, we can accomplish this end as readily as by the application of a caustic, and with less likelihood of leaving a noticeable scar. For pigmented naevi of large size, I will not recommend the electrolytic needle, as I have had no experience in its use in such cases.

**Fibroma Simplex.**—Upon the cheek of our next patient, a woman of forty-five, you see a little excrescence of the size of a small pea. Such a growth is commonly spoken of as a "wart" or a "mole." Frequently it is pigmented, and the seat of a few stiff hairs, and is called *naevus verrucosus*. The growth in this case is of firm consistence, with a smooth surface, and slightly redder than the surrounding skin. It is simply a hypertrophic growth of the fibrous tissue of the corium, and constitutes a blemish which is very frequently seen upon the face of persons of middle and advanced age. Its removal is by no means imperative, and the fear expressed by our patient, that it is likely "to turn into a cancer," is unfounded. There are ladies who affect to regard an unsightly excrescence of this kind as "a thing of beauty," but you will find that when they learn that it can be removed with very little pain, and without the use of a knife, they will be very willing to part with it. In this case we will use fifteen cells of our constant current battery, and transfix the growth with the needle upon a level with the surrounding skin. You now see that the growth is turning white from the action of the current, and that the needle can be moved forward and backward with perfect ease. We will now transfix the growth again, the needle being at right angles to its former direction, and allow the electrolytic action to proceed as before for about ten seconds. What will be the result? For about twenty-four hours the growth will be slightly swollen and inflamed, and although it is not necessary, it may be advisable for the patient to keep a hot fomentation over the part. In a few days the growth will shrivel away, possibly forming a minute crust or slough, and in a few weeks there will be nothing but a slight cicatrix to denote the site of the operation.

In the cases of multiple fibromata, which occur upon the body and extremities, the tumors are usually too large for this treatment, and they should be removed, if it is deemed necessary, by the knife or galvano-cautery.

**Xanthoma.**—Another facial blemish, which you may be called upon to treat, is the affection which is known as xanthoma or xanthelasma. This appears usually in the form of oval yellow patches upon the upper eyelids near the inner canthus of the eye. One or both upper lids may be affected, and in some cases fainter yellowish patches are noticed beneath the eye. Patients affected with xanthoma are apt to have hepatic derangement, and to present a sallow complexion, with dark rings around the eyes. The principal, if not the only, treatment which has been employed in these cases is excision, a remedy which, in the estimation of many patients, is worse than the disease. In the case of a lady who recently applied to me for treatment of xanthoma, and who was averse to any cutting procedure, I resorted to the use of the electrolytic needle, and succeeded in removing the growth. I will not presume to recommend this plan of treatment on the strength of my limited experience, but I shall certainly adopt it in the next case with which I have to deal.

There are some other cutaneous affections in which the electrolytic needle might be employed to advantage, but what I have already said will give you an idea of its value and extended application. It acts like a caustic in destroying the cutaneous tissue, but is more efficient in many respects and under our control to a far greater degree than any ordinary caustic which could be used. It is not a true caustic in an etymological sense, for it destroys tissue by chemical action, and not by the generation of heat as in the platinum wire connected with a galvano-caustic battery. And now, before closing, let me say a few words in answer to questions which might otherwise be asked respecting the character of the battery employed for the purpose of electrolysis, and the number of cells which it is necessary to use. It seems almost superfluous to say that the battery should be of the kind which is known as the galvanic or constant current battery, and yet I have known physicians to attempt the use of electrolysis with a Faradaic battery—i.e., one with an interrupted current, which is wholly unsuited to the purpose. The galvano-caustic battery, though producing a constant current, is constructed for the sole purpose of heating a platinum wire, and is equally unsuited for electrolysis. There are a variety of galvanic batteries with different elements, any one of which will answer the purpose of electrolysis, but the ordinary zinc-carbon battery is the one commonly employed. I have used here in the clinic a chloride of silver battery with cells hermetically sealed, and which is therefore adapted to being carried about. It can be tipped over without any danger of ruining a carpet by spilling the contained fluid, but it is an expensive battery, and one very liable to get out of order, and hence not to be recommended for general use. The battery which has given me the most satisfaction is the zinc-carbon battery, manufactured by the Electro-Medical Manufacturing Company, of this city. It possesses electromotive force in a high degree, is very simple in construction, not liable to get out of order, and easily repaired when this becomes necessary. It is constructed with a varying number of cells, but the twenty-cell battery is the size which I should recommend for use in the treatment of the affections of which I have spoken. This battery is so constructed that if a few of the cells are exhausted the remaining ones can still be used. In the operations to which I have referred, from ten to fifteen cells may be required. If the battery fluid is fresh, the sponge in connection with the positive electrode well moistened, and applied to the skin as near as possible to the needle, the current will be at its maximum strength, and a smaller number of cells required than when the battery fluid is weakened by use, the sponge dry, or nearly so, or when the circuit is completed, by placing the positive electrode in the patient's hand, and the resistance to the current thereby increased. These points being borne in mind, a sufficient number of cells should be employed to produce the desired effect—viz.,



a gradual dissolution of the cutaneous tissue at the point where the needle is inserted. It is always advisable to introduce the needle before completing the circuit, and to break the circuit before withdrawing the needle. By observing this rule an unpleasant shock may be avoided.—*Medical News.*

#### SUDATORIES AT THE HEISER MEDICAL GYMNASIUM.

THE accompanying engravings show the arrangement of the sudatories employed in the Heiser Medical Gymnasium at Paris, which are especially designed for the treatment of gouty, rheumatic, and cutaneous affections, and certain maladies of the organs of respiration. These apparatus, which are got up under the best of conditions for giving comfort to those who use them, permit of taking steam or hot air baths, and of procuring those artificial sudorific effects that are recommended by physicians in a large number of cases.

#### CRATERS OF THE MOON.

THOSE parts of the moon's surface that commonly receive the name of *craters*, the numerous circular forms inclosing a depression, in which mostly rises a group of hills, have no great similarity to the volcanoes of our earth. On the other hand, lunar formations have been described in recent times which, in the opinion of selenographers, are the analogues of terrestrial volcanoes. In this class Herr Klein (in a recent paper, of which an abstract appears in the *English Mechanic*, translated from *Der Naturforscher*), reckons in the first place the so-called *crater cones* of Mr. Neison to belong. These are steep or conical hills, or mountain summits, varying in diameter from  $\frac{1}{2}$  to 2 or 3 miles, with steep, funnel-like, central depressions, scarcely half as large, which, with a high sun, appear in strong telescopes as very small white spots; they occur sometimes on the top of a mountain, but not infrequently also on the inner surface of a circular range, or a walled plain.

Another class of formations of the moon's surface, which seem to Herr Klein in a still higher degree to resemble our volcanic formations, have previously been observed only by

moon for its darkness and regularity. Within this spot Herr Klein has discovered the bright crater cone, and he has closely studied it. He gives a small map, showing the position of this cone and its surroundings. From observation with different solar altitudes, it appears that in the neighborhood of the crater-cone small hill ranges and undulations are present, and as one can still at the same time perceive the double triangle in them, a distinct conviction is reached that the dark material has everywhere spread to the lower positions, and has thereby acquired the characteristic form of the triangle. This material, however, can only have accumulated in a comparatively thin layer, which could not cover even small elevations, for even the small hillocks appear, with a certain solar altitude, as fine light points projecting from the dark triangular surface. Thereby is also proved that the dark material did not fall from above like volcanic ashes, and cover everything; but that it was liquid, as it spread outward.

"In my opinion," says Herr Klein, "the relations here depicted prove the existence of phenomena on the moon's surface which present the greatest similarity to the lava-floor of our terrestrial volcanoes, so that the occurrence of true volcanic phenomena on the moon is no longer to be doubted. These phenomena belong, in the case of the crater described, to an epoch when the hill-ranges of the surrounding surface were already present, so that the outflowing material had to follow the inclines presented by the ground.

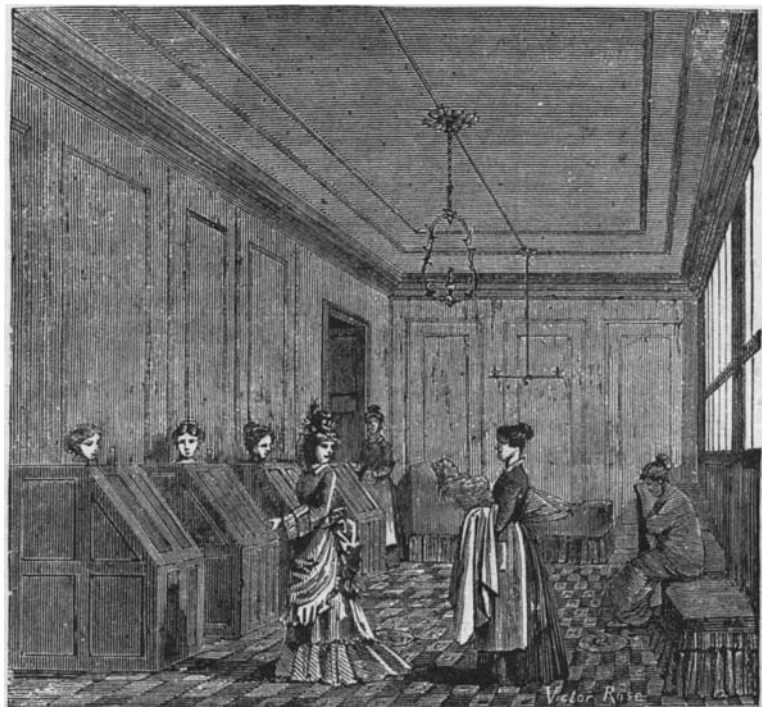
"While in the example just given, all the phenomena point to lava-like flows, we may in another case, though with less certainty, infer the covering of the ground with stone or ashy masses. The region in question lies at  $1^{\circ}$  N. lat., and  $47^{\circ}$  W. long. There the gray bottom of the shallow sea, studded only with very low hills, is traversed with bright streaks of light. One observes, however, even with a low sun, that on a surface of several square miles, an egg-shaped spot, as of dark gauze, covers the ground, and below it the brighter and darker parts of the ground glimmer out. This spot gives an observer the impression of its being transparent, or of a fine mist covering the ground. The latter, however, cannot be accepted, for the spot is a quite persistent phenomenon, a modification of the color of the moon's ground. But such would necessarily arise if the

It was truly a beautiful sight; yet, no artist could in safety to his life, stop long to study its beautiful conformation. From the center of this collection of revolving streamers there came a balloon-shaped, green-looking cloud, or rather crooked, smoky column, which extended about one hundred feet in the air—this is the cyclone proper.

It kept constantly changing its position, motion, and shape. At no time did it look the same as at another; sometimes funnel-shaped, larger at the top, then inverted and larger at the bottom. It came wriggling, jumping, whirling, and twisting like a great, green snake, darting out a score of glistening fangs. These antennæ-shaped things were bright and clear, but in a few moments went out of sight behind the enveloping clouds, which were struggling to embrace the cyclone. There had been very little lightning and only a few low rumblings of thunder. Scarcely enough rain fell, from first to last, to lay the dust, and no rain at all during the cyclone. The cyclone was right on us before we noticed any unusual force of wind. The wind had been blowing as much from one point as another. When this cloud had come out clearly to view and transformed itself, as we have related, another cloud, not so large and in no way, save color, like the first, was seen moving from a point far south of west.

The two were approaching with astonishing rapidity. Presently they seemed to be converging, and in a few minutes they met. Before they met the lightning played from the back of one to the other, like fiery serpents. After they met all definite shape was lost. The color of the whole mass was a little darker, and all the clouds and parts of clouds were jumbled up together, and rolling and boiling around in the sky. In a few moments two of the most vivid flashes of lightning I ever beheld descended from mid-sky to the earth. These strokes were about one hundred yards apart, and were simultaneous.

Not until those strokes did the terrible roaring of the cyclone commence. There had been from the first a low rumbling and muttering, but no well-defined roar. This increased for perhaps one and a half minutes, until it was a deafening sound, something like that made by freight trains crossing bridges, only a little sharper. The wind began then to blow very hard and from the west, but nothing very firm was moved until the cyclone had spun



SUDATORY HALL FOR LADIES. (Heiser Gymnasium.)



SUDATORY HALL FOR GENTLEMEN. (Heiser Gymnasium.)

Herr Schmidt in Athens, who described small dark spots as imperfect half-shaded craters, and in them a white central part, which appears at times as a crater. These forms are so rare that Herr Klein can only count five which present this type with certainty, and two in which it is probably present.

Herr Klein, without knowing of Herr Schmidt's observations, has himself found two of these formations in the neighborhood of Theophilus, and regarded them as craters with bright white crater cavities, which are surrounded to a great distance with a ring of gray matter. The larger of the two craters appeared on further observations as a flat cone, on the outer portion of which (extending several miles) the steep eruption-cone stands at the highest point; the dark gray mass was only in the neighborhood of the white main crater, bedded round about its steep cone (on the slope Herr Klein observed some small secondary craters). The second crater showed similar features; but since last autumn it has not been so distinct as before, and one sees now only a gray spot within a dark ring. A similar object was discovered fifty years ago by Gruithuisen, south from Hyginus; he saw a small, bright, white crater in the middle of a gray broad spot. This small crater is still present; but Herr Klein has never seen it as a bright spot, nor has Herr Schmidt. Now, since Gruithuisen's observations are beyond question, it is to be inferred (Herr Klein says) that that small crater has darkened in the course of years. "From the agreement in the cases mentioned, but especially also from very careful examinations of the large crater in the southwest of Theophilus, it may be concluded that the dark matter which surrounds the brightly shining crater was thrown out from this. We may regard it as a kind of lava which, in time, fades." That the formation of the ring of dark matter, or the "eruption" southwest of Theophilus, belongs to recent time, Herr Klein infers from the circumstance that this dark spot, which is very obvious, and even appears on one of Rutherford's lunar photographs, was seen neither by Lohrmann, Mädler, nor Gruithuisen.

The intimate connection between the dark matter and the bright crater at its middle, as also the inference that this mass was thrown out, lava-like, from the crater at a time long after its formation, Herr Klein has been able to establish by several years' study of such a lunar crater observed by no one previously. The object in question lies in the interior of the great walled plain Alphonsus, where Mädler has described a triangular dark spot, remarkable in full

ground, both where it is bright gray and where it is crossed with white streaks, were covered with ashy or stony masses in very thin layers. Similar indications are found in other places on the moon's surface; but they have mostly escaped moon-observers hitherto, because these considered the more general and large features of the lunar surface, and the investigation of details has properly only begun. Thereby, already, a much greater similarity of the moon's surface to that of our earth than was formerly supposed, has been made out. Still the investigation is only beginning, and is in presence of quite infinite detail; besides this, it is much more difficult and trying than many other observations."

#### THE CYCLONE AT BROWNSVILLE, MO., APRIL 18, 1882.

By W. H. WILLIAMS.

THE terrible agent of destruction which visited Brownsville on the afternoon of the memorable day above named, was, perhaps, in some respects, the most peculiar of any one of its kind ever seen or felt by the people in this latitude.

During the entire day clouds were seen in all directions in the sky; but they were only light, fragmentary ones, the feathery appearance of which did not attract more than a glance. It was not until 3:45 that the overcast of the heavens began to signal the approach of a storm of great violence.

At that hour the whole surrounding atmosphere began to assume a dull, heavy color, and then change to an orange tint, very unnatural and peculiar. For a few moments all objects appeared as if seen through stained glass. Toward the southwest a very dark, heavy, green looking cloud was seen rising just above the tree tops. This cloud was compact in shape, solid in surface, and seemed to overspread about two or three hundred acres of land.

The outer edges appeared to be thin and vapory, while the space below the cloud was filled with a kind of light, waving substance, resembling a morning mist. This was constantly in motion, and as the cloud moved toward us this stringy, root-like mass of mist was whirling and twirling in rows about as wide as the compact surface of the cloud. This singular tube-like formation and motion was what first created in our mind the alarming impression that the dreaded cyclone was approaching us. The phenomenon was more like water running through glass tubes than anything to which we can compare it.

and buzzed over the hill to the southwest of the town, and all at once, whirling and bounding, sprang into the midst of the streets.

After it had passed over and through the streets, indeed, before the force of it reached us, and while it was in the midst of the buildings, there was a still darker and greener-colored atmosphere lit up continually by tinges of orange and gleams of red.

Many can testify to the singular appearance of the light emitted from beneath, above, and from within the folds of the cyclone.

Houses and fences were not blown down, it is true; some of them were, but in general they were drawn up and twisted around, and then fell back on their foundations. There was not much evidence of any great force of straight wind; only here and there were objects found pointing the same way. As much debris was found thrown in one direction as another.

The path of the cyclone was nearly northeast, and was about two hundred yards wide.

When within one mile of Brownsville it came in a zigzag course, but before that its main course was northeast, and this direction it kept up until it was scattered. The time of its passage over the city was, perhaps, three-quarters of a minute or more. Its velocity in coming from Montrose to Brownsville—a distance of sixty-two miles—was one and eleven-twentieth miles per minute. Brick houses were seen to rise two feet from the ground and then fall back on their stone foundations, scattering the debris in all directions.

Houses were found twisted at opposite points, strong fences were drawn down in shape of square and triangles; boards, posts, gates, scantlings, and stringers were found hundreds of yards off, thrown at all possible angles.

Hardware stores, blacksmith shops, plow-rooms, and display houses, were totally demolished, showing no signs of being blown. A safe belonging to George W. Smith was found some forty or fifty feet from where it stood in his office. There were strong currents of attraction toward this cyclone.

Places were found where trees one and a half feet in diameter were drawn out of the ground, roots and all, while not ten feet away frame shanties remained standing. Scantlings and fence-rails, after whirling around in the air, were thrown off at a tangent and flew like darts through frame buildings, and in some places were found sticking to the depth of two feet in the ground. A flock of geese was