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THE

ACTUAL CAUTERY

AND

Its Employment in Cutaneous Surgery

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If the employment of a remedial agent, or method of treatment is attended with much inconvenience or expense, its general introduction and adoption is apt to be tardily accomplished, no matter how valuable the remedy or method may be. This is peculiarly true of the actual cautery. Passing by the time when the hot iron was used as a hæmostatic, anterior to the introduction of the ligature, we find that the actual cautery was principally confined to the following applications: First, the destruction of small vascular growths, as nævi upon the face, etc.; second, of cancerous growths upon the neck of the uterus; and third, as a means of counter-irritation over the larger joints when diseased, and along the spine in certain affections of the cord, etc. The practical difficulties in the way of a successful use of hot irons were mainly due to the fact that the metal began to cool, and to cool rapidly, the instant it was withdrawn from the fire, and consequently, if the operator desired to employ the heat at a particular temperature, he was obliged to manipulate with a rapidity that was inconsistent with proper care. The importance of maintaining and using a temperature appropriate to the particular operation on hand, must not be overlooked; a fact of which the following case affords an illustration: A young gentleman having suffered for some time from an intense neuralgia, and having tried various methods of treatment without relief, consulted an eminent physician of this city, who recommended that an iron heated to whiteness should be applied at a certain point in the course of the affected nerve, and sent the patient to a well known surgeon to have the operation performed. The latter applied the iron, not at a *white*, but at a dull barely red heat. The application was exceedingly painful, afforded very little if any relief to the neuralgia, and was followed by an extensive slough, and an ulcer, which for weeks had refused to heal. In this latter condition he came under my care, having been sent by the physician first alluded to. If now, *white* heat had been employed, the probabilities are that the operation would have been very much

less painful, the slough would have been smaller, the ulcer would have cicatrized immediately, and the scar would possess far less of the retractile character which is displayed by cicatrices resulting from burns at a comparatively low temperature, as those from burning clothes or boiling water, the scars from which so often produce serious deformity. Now, the temperature of boiling water cannot exceed 212° F., and that of burning clothes may not be much greater, but white-hot iron or platinum possesses a temperature above 1000° F.; and experience shows that the effects will vary greatly with the degree of heat employed, a fact which must always be borne in mind in cautery operations. In certain operations a white heat is not desired, as a dull heat will better fulfill the special indications. We should therefore well consider the temperature best suited to the particular case, and should possess the means of maintaining and controlling it. The difficulty of accomplishing this with the blowpipe or furnace as the source of heat, greatly limits the use of the ordinary cautery irons.

Twenty years ago Middeldorff brought into prominent notice another method of generating heat for surgical purposes, namely by the aid of electricity.* By this means he obtained perfect control of the temperature, but the apparatus was expensive and cumbrous. The consequence was that galvano-cautery was rarely used, except imperatively demanded, and many useful applications of the method were neglected or replaced by less efficient means of treatment.

During the past year, however, the prominent objections to the employment of the actual cautery have been dissipated by the invention of three wonderfully efficient and convenient galvano-cautery batteries of American construction. I allude to the recently patented instruments of Drs. Dawson and Byrne, and to the one (not patented) made by the Galvano-Faradic Manufacturing Company of this city.† In addition, a cheap cautery instrument, (not a battery) capable of fulfilling many of the requirements of actual cauterization, has been recently invented by Dr. Paquelin, of Paris. Dr. Allan McL. Hamilton, of this city, has also recently revived and improved an old cautery instrument, the origin of which I am unacquainted with. It will do about the same work as the Paquelin cautery, and is cheaper. Finally, the solar cautery, a lens four inches in diameter, and six inches focus, must not be forgotten.

With convenient, efficient and cheap instruments, there is no longer any excuse for neglecting the actual cautery when indica-

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* Middeldorff did not discover this method, as it had been in use to a limited extent before him. He was the first, however, to give it much prominence.

† These three instruments are in every way superior to anything of the sort manufactured abroad. They are likewise much cheaper than the less efficient instruments of two years ago.

cated; and there is no doubt but that its useful applications will rapidly multiply. Having for several years been satisfied of the advantages to be derived from the actual cautery in proper cases, I have been enabled, since the advent of convenient instruments, to employ it somewhat extensively in connection with the treatment of certain cutaneous affections; in part, repeating the operations of others, and, in part, devising fresh applications of the method. The principal affections of the skin in which it has been found of service will be mentioned below.

Rosacea.—In the *second* stage of this affection we frequently find the veins of the nose, more especially those of the alae, greatly distended, and more or less varicose. An important step in the treatment of this affection is obliteration of these enlarged veins. This may be effected in various ways; by division of the veins with a suitable cutting instrument; by injection of coagulating substances, or by the actual cautery. This latter may be accomplished with a platinum wire heated by a spirit lamp, or better by means of a small battery. For this little operation the two cells of an ordinary induction machine will generate sufficient heat, provided a quite fine wire is used. The vessel to be operated upon should be just touched with the wire heated to whiteness. The result will be obliteration of the vessel, reduction of a good deal of the congestion and infiltration around it, and ultimately a minute punctate scar, the size of which will depend upon the care and delicacy with which the operation is performed. In the *third* stage of this affection, characterized as it is by great hypertrophy of the parts, the actual cautery has been satisfactorily employed by RICHET.* In this case the heated wire should penetrate the whole depth of the thickened integument at several points. The result will be shrinkage of the parts and lessened deformity.

Varicose Veins.—I have in several instances secured obliteration of enlarged veins of the lower extremity by bringing the white hot platinum (heated by electricity) *almost* in contact with the vein. The platinum should not quite touch the skin, and should be held in position for a minute or more. The immediate result will be a blister upon the surface, and ultimately obliteration of the lumen of the vessel, and a pigment spot, more or less permanent, upon the integument.

Angioma.—I here refer to the little blood-red vascular elevations, whose size rarely exceeds that of the head of a match. They are frequently, in fact generally, multiple, existing upon the face and elsewhere to the number, sometimes, of twenty or thirty. A fine wire well heated is the neatest and quickest method of disposing of them.

Nævus Vascularis.—The purely superficial capillary nævus (wine-mark) if quite small, may very properly be treated by the

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* L'Ignipuncture, etc., par TRAPENARD. Paris, 1873.

galvano-cautery, delicately applied. The solar cautery has also given good results in the same. Extensive "wine-marks," however, demand other treatment; Squire's scarification method being probably the best. If the nævus, instead of being purely capillary and superficial, is composed of vessels of some size, and is located in the subcutaneous tissues as well as the skin, or if it projects above the surface, actual cautery is an effective method of treatment, whatever be the size of the lesion. These nævi are usually treated by injection, ligature, electro-puncture (electrolysis so-called), caustics (potasa fusa, etc.,), or actual cautery. If cautery is selected, the instrument should be heated to a *red* heat only, introduced and kept in *sitû* some little time. If *white* heat were employed there would be considerable danger of hemorrhage. If the instrument is inserted perpendicular to the surface of the nævus, a cicatrix corresponding to each puncture will result. When, however, the nævus is considerably elevated, the best way of operating in my judgment, is to make a small incision or puncture with a scalpel, just through the skin at the edge of the nævus, then introduce galvano-cautery wire cold, close the battery circuit, and let the wire heat gradually, taking care that no more heat is employed than would suffice to redden the wire in the open air. When this is attained open the circuit and carefully withdraw the wire. By this method of operating there will result coagulation of the blood and destruction of the vessels to a considerable extent around the wire, and very little risk of hemorrhage. The skin outside the nævus should be protected at the point of puncture by means of asbestos. In general, however, I think electro-puncture (with the positive needle only) preferable to cauterization in the treatment of nævus, as when properly performed less scarring results.

Lupus.—In the severer forms of tubercular, ulcerative and rodent lupus there can be no question that actual cauterization (where excision is impracticable) is the most satisfactory method of treatment, and is to be altogether preferred to the potential caustics. In several of these cases the results have been extremely gratifying. There is, however, another form of lupus, called by Kaposi, the orbicular variety of erythematous lupus, which in an advanced condition is characterized by a ring of infiltrated tissue, enclosing a portion of skin, reddened and perhaps thinned, but not accompanied with ulceration. The tendency of the affection is to extend centrifugally, and to result in atrophy of the portions of tissue involved. The therapeutic indication is to check the extension of the lesion. This may be effected by applying a fine white-hot wire along the outer edge of the infiltration, and burning through the whole depth of the skin; the resulting circular cicatrix will form a barrier across which the lupous infiltration will not extend, and the final result will be a white depressed scar corresponding to the whole of the surface that has been invaded by the disease.

Epithelioma and Cancroid.—Epithelioma of the lower lip, when the lesion is exuberant and forms more or less of a tumor, is most conveniently removed by excision; but when the lesion is ulcerative and depressed, and without much peripheral infiltration, the actual cautery white-hot appears to me preferable. In treating cancer and lupus in this way the cauterization must be thorough; mere scorching of the parts will not answer. The diseased tumor must be *destroyed*, otherwise the cautery will act as a stimulant; and upon the shedding of the very superficial slough, morbid action will be renewed, and the patient be injured rather than benefited by the operation.

Ulcers.—I have on several occasions beneficially modified indolent and ill-conditioned ulcers by cauterization at a white head.

Chancroids.—It is in this affection especially that the actual cautery has given me remarkably good results. One good white-hot cauterization being sufficient to destroy the virulent properties of the sore, and upon fall of the slough to leave behind a granulating ulcer with tendency to heal. This method materially shortens the time of treatment, as I have elsewhere shown.* A. Paquelin's, or Hamilton's cautery, will be found very convenient, and in some respects better than the galvano-cautery, in the treatment of these lesions. A few experiments satisfied me that the indurated *chancre* is not beneficially influenced by the cautery.

Venereal Warts.—The most effectual treatment of these is to snip them off with scissors, and to touch the bleeding bases with the red-hot wire. This stops the hemorrhage, and effectually prevents the return of the original trouble.

Pediculated Tumors of the Skin.—Amussat† has several times removed pediculated tumors from the skin, by means of the galvano-caustic loop or knife. The only object of using the cautery in cases of this sort is the avoidance of hemorrhage, or of *sepsis* in a crowded hospital ward, otherwise cold steel would be preferable. Personally I have removed but two pediculated tumors by cautery. One was a lobulated tumor the size of a pigeon's egg, removed from the right labium majus, and the other was an enlarged *preputium clitoridis*, which after removal was found to weigh between six and seven ounces.‡

Circumcision and division of the prepuce in the medio-dorsal line have occasionally been effected with the cautery loop or knife, but not by myself, as I have not yet met with a case in which the operation appeared justifiable. I can conceive, however, of its being suitable and proper, if circumcision is imperatively demanded in the presence of a sub-preputial chancroid, the latter being also thoroughly cauterized at the same time.

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* Archives of Clinical Surgery, November, 1876.

† Memoires sur la Galvano-Caustique Thermique. Paris, 1876.

‡ The case is reported in the American Journal of Obstetrics, August, 1876.

In making delicate applications where but small points only are to be touched with the glowing metal, the eyes of the operator should be guarded with blue glass spectacles, otherwise the intense glare will prevent a distinct view of the point to which the application is to be made. In using the solar cautery, this is specially important.

The above are the principal applications of the cautery in cutaneous surgery, as yet developed, and the present article is intended to be suggestive rather than exhaustive. The increasing employment of the actual cautery in general medicine, surgery, and gynæcology, is due in part to the increased facilities for its use, and in part to a growing belief in the truth of "Hippocrates's last aphorism," a latin translation of which is here appended. "Quæ medicamenta non sanant, ea ferrum sanat. Quæ ferrum non sanat, ea ignis sanat. Quæ vero ignis non sanat, ea insanabilia reputare oportet."