

duced abundant bleeding. I shall not describe the obvious changes which took place during eight weeks I made daily observations upon the case. Suffice it to say, they confirm in a rough way the statements given with such careful detail in Dr. Hamilton's paper. One fact I may note, however, as favouring a conclusion opposite to that of Dr. Hamilton on the subject of nerve-supply, he not believing in the production of nerve-tissue at an early stage. I pricked the most superficial portion of the new growth from time to time with the point of a needle, and I asked medical friends to do the same, and pain was most certainly felt by the patient on every occasion. At the same time, Dr. Hamilton's far more extended observations entitle his evidence to regard which I cannot claim for mine. Watching the progress of the case from day to day, a fact which strongly impressed me was that a very protracted period is necessary before organisation can encroach to any extent upon the sponge area. Within three days of application, there is firm union between the living tissues and the sponge. We could hardly expect the vessels to continue their invasion at the same rate afterwards. A physical law may have largely to do with starting the process, which afterwards becomes more purely dependent on vital phenomena. In my case, nearly two months after the application, I was able to remove the superficial part of the sponge with the scissors to the extent of nearly half the original thickness before I encroached on newly vitalised tissue.

In the meantime, another opportunity had been presented me for sponge-grafting, and the issues in this case were peculiar. Dr. Graham, of this city, asked me to see a private case of an ulcer of three months' standing, during which period it had baffled all ordinary methods of treatment, and to decide if the new method might be resorted to. The sore lay over the lower end of the tibia; its size was that of a half-crown; its surface was exsanguine and hard; and its edges were tightly drawn down towards its floor. As a preliminary to further proceedings, caustic was used to the margins, and a strongly stimulating lotion applied twice daily for two days to the surface. The latter proceeding had no appreciable effect. Scratching with the end of a scalpel was now resorted to, until a freely bleeding surface resulted. A bit of sponge was then applied, and kept bound on for three days, when it was found to have united. In three days more, the patient complained of much pain extending up the limb, and the appearances of erysipelas were found spreading from the ulcer upwards. The patient declared himself subject to idiopathic erysipelas. These indications were judged as a living removal of the sponge, and the act produced considerable pain and hæmorrhage. A subsidence of the diffused symptoms took place immediately. As regards the ulcer, the changes were specially noteworthy. What had been the type of indolence and obstinacy among such sores was now the picture of healthy action—the surface abundantly vascular and standing well up towards the level of the skin. The simplest dressings were now sufficient to promote repair; and in three weeks from employment of the sponge recovery was complete. What was the cause of this sudden change? Was it the erysipelas, or was it a foreign body having simply an irritant action, or that effecting an action peculiar to itself? In any case, the sponge was a factor in the process, and deserved further employment.

To return to the first-mentioned case. At one portion of the sore under treatment by skin-transplantation, retrogressive changes set in, and became most persistent. Successive sloughs followed one another until there remained an almost circular gap of fully an inch in diameter, with edges abruptly punched out to the depth of over a quarter of an inch, and its floor, which lay close to the bone, of white fibrous-looking structure. Into this depression, after having used a knife to the floor, as in the other case, I fitted a piece of prepared sponge. Two days effected the same union as before. On the fourth day, I forcibly elevated half of the sponge—pain and bleeding again the accompaniments—and snipped off this semicircle with the scissors. The exposed part left presented highly vascular tissue, reaching well up towards the body-surface as compared with the former depth. In four days more, the remainder of the sponge was detached, and its site was seen to be occupied by a level of new tissue, very slightly higher than the other half. The deficiency left below the level of the skin was soon made up by unaided natural processes, small particles of transplanted skin were applied, and in the end nothing remained to indicate a spot treated differently from parts around. The portion of the ulcer to heal most slowly was that where the sponge was originally applied. I should have removed the whole graft here, as in the other instances, but successive shavings from its surface, in the manner before alluded to, had left only the deep portion, which was now incorporated with the new tissue or disintegrated. Skin-grafts, it was noticeable, were slow to attach to this area, but eventually they became reconciled to it, and the result was a complete cure.

My experience of Dr. Hamilton's proposal has thus been compara-

tively limited, and I leave to wider observation upon it to yield more conclusive evidence as to its general efficiency. I venture to recommend, however, a recourse to the modified or temporary sponge-grafting—if *grafting* is, indeed, a correct expression to apply to the method I have found useful—for at least certain varieties of breach of tissue.

#### ON THE TREATMENT OF PARTIAL TRICHIASIS BY ELECTROLYSIS.\*

By ARTHUR BENSON, M.B. Dub., F.R.C.S.I.,

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No portion of the human frame, except perhaps the uterus, has been made the subject of so many and varied experiments at the hands of the ingenious operator as the eyelid; and yet how unsatisfactory all previous experiments have proved, is shown by the host of fresh ones yearly added to the list. The ophthalmologist must be pre-eminently conservative, and in nothing more so than in operation upon the eyelids, hence arises the great difficulty, to alter the shape of the lids, or the direction and position of the cilia, without sacrifice of any tissue.

It is not, however, my intention to speak of the general subject of palpebral surgery, but rather I desire to confine my remarks to the treatment of partial trichiasis. Some method of getting rid of individual cilia, without displacement of those in their immediate neighbourhood has long been a desideratum. It often happens that one, two, three or a dozen hairs are growing in a wrong direction on the lid border, the remaining cilia being in a perfectly normal position. And in such cases most of the text-books advise repeated epilation, a treatment which only gives temporary relief at the expense of future misery; for the irritation caused by the young hairs will most certainly tend to increase the mischief which the epilation for the time relieved.

Instead of epilation, where the offending cilia are few and long, a classical method of treatment, as old as Celsus, and recently revived by Snellen, will, in a fair percentage of cases, prove satisfactory; I allude to *illaqueatio*, or snaring of the hair and turning its direction of growth outwards instead of inwards. This operation, however excellent in the cases in which it is applicable, is very limited in its range, and the snared hairs are very liable, sooner or later, to resume their previous vicious direction. Having practised this operation in a large number of cases, and finding that its action was by no means certain, and having no reliable evidence in favour of the destruction of the hair follicles by such agents as potassa fusa or chloride of zinc, I gladly availed myself of the suggestion of using the continuous electrical current, and decomposing the tissue of the hair-follicle by electrolysis.

As this method had not, as far as I am aware, been tried before by others, I had no rules to guide me. Dr. A. Nieden of Bochum, writing on the subject of "The Application of Electrolysis in Ophthalmic Therapeutics" in the *Archives of Ophthalmology* of March 1881, makes no mention whatever of its employment for the destruction of hair-bulbs, but confines his remarks to its use in the treatment of *nævi*, etc. The plan I adopted, and one which I have since continued to use, was as follows.

To the negative electrode of a Leclanché's battery, I attached a rather fine gold electrolysis-needle, and inserted the point of this to a depth of about four or five millimètres along the hair to be destroyed, so that its point should reach well above the root. I then applied the positive electrode to the lid near the outer canthus (having first made sure that the battery was working sufficiently well); contact was conveniently made by wrapping some wet cotton wool round the end of the wire. In a few seconds, the tissues immediately around the needle (negative electrode) began to show white, and soon a distinct bubbling of hydrogen gas could be observed. Half a minute or so, according to the strength of the battery, usually sufficed to completely loosen the hair; I then withdrew the needle, and the positive electrode, and, with the fingers or a forceps, removed the hair. It should come away without requiring the slightest drag, and bring with it a gelatinous-looking mass of dead tissue. If the hair be not sufficiently loose, the needle must be reapplied for a few seconds; but, with a little practice, the required time can usually be guessed with accuracy. Each hair has, in this manner, to be destroyed.

The amount of inflammation of the lid resulting is usually not great. In one of the first cases in which I tried electrolysis, an abscess formed, owing, no doubt, to my having inserted the needle too deeply; but that was the one and only untoward result which I have seen in about 120 hairs so treated.

\* Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association in Worcester, August 1882.

Four of Leclanché cells are usually enough, if the battery is in good order; but the current must be strong enough to decompose water with facility.

It seems not to be advisable to destroy very many hairs in the same lid at a sitting, for the resulting swelling is sometimes considerable. The advantages which I claim for this method over epilation, snaring, or the actual or potential cauteries, are these.

1. Any individual hair can be destroyed without injuring those beside it.

2. The hair can be got rid of at once and for ever.

3. Hairs of any length, strength, or position, can be treated.

4. By its early use, it will render unnecessary many of the more formidable operations on the lids, besides saving the patient much misery.

In cases where a very large number of hairs are misplaced, or where entropion exists, it is inapplicable, and some of the numerous plastic operations should be preferred.

The greatest disadvantage, as far as I have seen, is, that it is very painful for the time.

I have now been practising this method for over four months, at St. Mark's Ophthalmic Hospital, during which time I treated 120 ciliae by electrolysis, and had some of the patients under constant observation for a month, and at intervals since, and have been able to observe no recurrences; and have been so pleased with the results obtained, that I have ventured to bring the subject before the Ophthalmological Section of this Association, feeling sure that to those who, like us in Ireland, have a large number of cases of trichiasis to treat, it will prove a valuable help; and that by its means many an one who had been for months a regular attendant for epilation to the *clinique* may be permanently cured.\*

Four months may seem too short a time to have tested the permanency of the cure; but, while freely admitting this, I must urge that by no other method that I am acquainted with have hairs been for so long kept from showing; and, from the nature of the case, there is every reason to expect that the vitality of the follicles have been quite destroyed, and consequently no return is possible.

If applicable for the ciliae, electrolysis should be equally applicable for the destruction of hair-follicles elsewhere, in moles, or hairy-faced females.

The method can, however, only be regarded as on its trial; but, so far, the results have been such as to encourage the most sanguine hopes, and to invite a much more extended trial.

## ON THE ABSORPTION OF CERTAIN SALTS FROM THE ALIMENTARY CANAL.

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In a series of papers on the Action of Saline Cathartics, which are at present appearing in the *Journal of Anatomy and Physiology*, I have drawn attention to a remarkable peculiarity in the absorption of sulphate of soda from the alimentary canal. I there state (vol. xvi, p. 568), as the result of a number of experiments—in which a purgative dose of the salt was administered to fasting cats, and the animals killed at various intervals afterwards, and the quantity of salt recoverable from the alimentary canal estimated—that, during the first hour after the administration of the purgative, the salt is rapidly absorbed, until nearly one-half of the whole dose (five grammes) disappears from the canal, whilst during the next hour the greater portion of the absorbed salt returns to the canal. The quantity of the salt was estimated from the quantity of sulphuric acid recoverable, which was precipitated in the usual way by means of barium sulphate from an acid solution of the ash of the dried contents of the canal. I have ventured to explain the peculiar course of the salt by suggesting that the rapid absorption occurs in the small intestine, and the excretion in the large intestine. A more detailed explanation will be found in the papers referred to.

Since these experiments were made, I have recently instituted others for the purpose of ascertaining if other purgative salts behave in a like manner to sulphate of soda, and if the base as well as the acid of each salt be similarly absorbed and excreted; for, as mentioned, it was only the acid of the sulphate of soda which I estimated. The other

salts employed in the present experiments were the sulphate of magnesia the phosphate of soda.

The results of the additional experiments with the sulphate of soda showed that, although the acid is rapidly absorbed during the first hour of the action of the salt, the base is not. For example, after the administration of five grammes of sulphate of soda to a cat, which was killed one hour afterwards, there were recovered from the contents of the alimentary canal, mixed with an infusion of the canal-wall, 2.544 grammes of sulphate of soda as reckoned from the sulphuric acid present, and 4.877 grammes of the salt as reckoned from the soda present. Other experiments performed in the same manner yielded like results. If the cat were killed two hours afterwards, nearly four grammes of the salt were recovered, as estimated from the acid, and about four grammes and three-quarters, as estimated from the base. After a longer period, the acid and base gradually became less.

The experiments with sulphate of magnesia yielded much the same results as those with the soda-salt. The acid rapidly disappeared from the canal during the first hour after the administration of the salt, and even to a greater extent than in the case of the sulphate of soda. As also with the latter salt, the acid returned to the canal, but not quite so rapidly as the acid of that salt. At the end of the second hour, there was hardly more of the acid in the canal than there was at the end of the first hour; but, by the completion of the third hour, the quantity had considerably increased. Meanwhile, the base or the magnesia was very gradually undergoing absorption, and never at any time during the first few hours after the administration of the purgative, was there evidence afforded of the base having pursued the same peculiar course of absorption and excretion as did the acid.

The following tabulated arrangement of these experiments with the sulphate of magnesia clearly brings out these facts. Five grammes of the salt was the dose in each case, and the cats were nearly of equal weight.

Experiment.	Killed after Administration of Salt.	Acid and Base Recovered from Alimentary Canal, calculated as Mg. SO <sub>4</sub> .7 H <sub>2</sub> O.	
		Acid.	Base.
		Grammes.	Grammes.
A.	40 minutes	3.132	4.966
B.	65 "	1.852	4.390
C.	80 "	2.001	4.240
D.	2 hours	2.065	4.009
E.	3 "	3.531	3.421

In my paper on the Action of Saline Cathartics, I pointed out that one-fourth part or less of a purgative dose of sulphate of magnesia will, when injected into the circulation of a dog or a cat, kill it; and I, at that time, remarked that, if this salt were absorbed into the blood in the same manner and to the same extent as the sulphate of soda, it was very strange that it did not exert its toxic action. I did not then know that the acid was absorbed, whilst the base, for the most part, remained in the canal, or was absorbed only very slowly. The present experiments, therefore, offer a very satisfactory explanation of the difficulty I formerly experienced. The salt is split up in the canal, and the basic or toxic part of it enters the blood very gradually, and not more rapidly than it can be excreted by the kidneys.

The remaining experiments were made with the phosphate of soda, to observe if the phosphoric acid of this salt might behave in the same way as the sulphuric acid of the sulphate. The experiments were only two in number, in one of which the cat was killed after one hour, and in the other at the end of two hours. In both the quantity of phosphoric acid recovered from the alimentary canal and its contents was large, and did not exhibit any evidence of the same primary rapid absorption as of the sulphuric acid. The phosphoric acid was, however, more reduced in quantity than the base, and it is probable that, to a certain extent, the phosphate undergoes decomposition in the canal.

How the splitting-up of the sulphates in the intestines is effected, and in what combination the acid passes into the blood, is beyond the scope of the present communication.

VACCINATION.—Mr. T. H. Hughes, Public Vaccinator of the Ombersley district of the Droitwich Union, has received (for the fourth time) the Government grant for efficient vaccination in his district.

\* Since writing the above, I have continued to use electrolysis for the cure of partial trichiasis with equally satisfactory results; I have now treated a very large number of hairs by this method, and can therefore speak with more authority; I have been much pleased to find that the method has since been adopted by several Ophthalmic Surgeons in England and Ireland.—A. B., Dec. 12th, 1882.

† Read in the Section of Anatomy and Physiology of the Annual Meeting of the British Medical Association in Worcester, August, 1882.