

submucous tissue, as well as the superimposed mucous membrane, becomes detached in the form of a slough, leaving behind an ulcerated surface." This is quite in keeping with my own observations, only, as will be observed, I give quite a different explanation of the distinction between the two forms of lesion. The *plaques dures* are the primary, the *plaques molles* the secondary lesions.

In the *primary* lesions the process of destruction commences in the glands and surrounding submucous tissue, and involves all the superficial structures; there is no reason, however, why it should go deeper than the seat of the gland, and we accordingly find that the base of the ulcer is generally formed by the muscular coat, which remains intact. In the *secondary* lesions the process of destruction commences on the mucous surface, and extends inwards in such a manner that there does not seem to be the same reason for its stopping short of the muscular coat. It is the progressive ulceration of these secondary lesions which imparts to enteric fever many of its dangers, and, among others, that which attends hæmorrhage.

From a consideration of the mode of vascular supply of the affected glands, we have seen that copious hæmorrhage can hardly take place from either the mucous or submucous coat, there being in them no vessels large enough for the production of such a result; and we have also seen that the extension of the process of ulceration to the muscular coat is not at all unlikely to be attended with serious hæmorrhage, the vessels in that coat being of considerable size. From a consideration of the mode of formation of the primary and secondary lesions, we have seen that the muscular coat is much more liable to be invaded in the latter than in the former: we therefore conclude that hæmorrhage of a serious nature is more likely to take place in a secondary than in a primary ulcer.

It follows from what has been said, that hæmorrhage may take place from (1) the mucous, (2) the submucous, or (3) the muscular coat. (The dangers of invasion of the peritoneal coat are other and greater than hæmorrhage.)

1. From the mucous coat it may take place in one of two ways: it may be due to the rupture of distended vessels, or it may take place in the ordinary process of ulceration. When due to the former cause it occurs early in the case, and is likely to do more good than harm; when due to the latter, it occurs later on, and is not likely to do good, as the time at which bleeding might be beneficial has passed,—neither is it likely to do much harm, as the vessels are too small to give rise to serious bleeding. Practically, I believe that bleeding from the mucous coat is nearly always the result of the rupture of over-distended vessels, and is nearly always salutary.

2. From the submucous coat blood can flow only during the process of ulceration. It can never be regarded as salutary, but is not likely to be very injurious, for the same reason which applied in the case of the mucous membrane—the vessels are too small, and the bleeding would very readily stop. I believe that such hæmorrhage is not common.

3. Bleeding from the muscular coat is always a source of danger. Such hæmorrhage of course can take place only during the process of ulceration. When once the muscular coat is invaded, the risk of serious hæmorrhage is considerable; for if one of the larger branches which run between the longitudinal and transverse fibres happens to be in the way of the ulcer, and is opened into, there must be a considerable loss of blood. Even from the smaller branches which pass from these larger ones to the muscular fibres there is some danger, but the chief risk is the involvement of the larger ones to which I have referred in the ulcerative process. This is the source of the copious bleeding which occurs late on in the course of enteric fever, and forms one of its great dangers. Such hæmorrhage, of course, is invariably a reason for grave anxiety.

Such are the varieties of intestinal hæmorrhage which occur in the course of enteric fever. For practical purposes they might be divided into the salutary, the trivial, and the serious. The salutary is that which is due to the giving way of the distended vessels of the congested mucous membrane; the trivial is that which occurs in small quantity during the process of ulceration of the mucous or submucous coat; the serious is that which results from the involvement of one of the larger vessels of the muscular coat in the ulcerative lesion.

It is important that these varieties of intestinal hæmorrhage should be recognised, as the prognostic significance and the treatment of each is different.

The first form does good, and requires no treatment. It should not be interfered with.

The second form, as a rule, does little harm, and need not be regarded with undue gravity; but as it is never possible to say that a slight appearance of blood in the stools after the middle or end of the second week is not due to invasion of some small muscular branches, it is well to be on our guard, for fear of a more copious flow.

The third form is always alarming, and may even prove directly fatal. In some cases the occurrence of the accident may be diagnosed before any blood is passed per anum; the pallor and prostration of the patient, the failing pulse, and the rapidly falling temperature, pointing to what is soon verified by the passage of a large quantity of blood by stool. The prognosis in such cases is always grave. So far as the immediate effects of the bleeding are concerned, the prognosis is directly as its amount and the ability of the patient to bear the loss. But the ultimate prognosis is also injuriously affected by the accident, for its occurrence indicates the existence of a still progressive secondary ulcer, and there is no saying where such an ulcer may stop: it may open into other vessels, or it may involve the peritoneum in its destructive course. Treatment should be prompt. Seeing the case while there was reason to suppose that the bleeding was going on, I should try the subcutaneous injection of ergotine; astringents should also be administered freely and in frequently-repeated doses; and the patient should at the same time be kept up by concentrated nourishment and stimulants.

Dundee.

## REMOVAL OF THE ENTIRE TONGUE FOR CANCER BY THE GALVANIC ÉCRASEUR.

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MRS. S—, aged sixty-nine, from Oldham, presented herself to my notice on November 29th, 1872, suffering from cancer of the tongue. The primary nodule was detected more than a year ago in the right lateral half of the tongue, within an inch from the apex, and thence it had extended beyond the median boundary to the left side and backwards to the margin of the papillæ circumvallatæ. The surface of the indurated portions was ulcerated, and bore the characteristic features of cancerous origin. The excruciating pains, swelling, and inconvenience, suffered by the patient were also those usually attendant on cancer of the tongue.

An operation for the removal of the tongue was arranged for December 4th. The patient being completely under the influence of chloroform, the tongue was firmly drawn upwards and forwards during the operation by a ligature which was passed through the tip. A loop of the galvanic écraseur wire was then passed into the mouth by a needle in the central line, midway between the jaw and the os hyoides, in close proximity to the tongue. The loop was then passed over the tongue into the sulcus in front of the epiglottis, and retained in this position by means of the forefinger of each hand until the wire had obtained firm hold of the structures within its grasp. At this stage, and not before, the galvanic circuit was made complete, and the platinum wires allowed to become sufficiently hot to give unmistakable indications of burning animal matter. A single turn of the écraseur-screw was made every half-minute, and during each pause the galvanic current was interrupted. About eleven turns of the écraseur sufficed to remove the tongue. No bleeding occurred either during or succeeding the operation, and immediately after the effects of the operation had passed off, the patient sat out of bed for a quarter of an hour.

For the first two days she was fed with warm milk, which she easily swallowed after it had been conveyed to the back part of the mouth by means of an ordinary glass syringe. Afterwards she was able to take fluid food naturally. A

large slough separated from the floor of the mouth at the end of the second week, and a small slough came away from beneath the jaw about the same time; the latter left a fistulous communication with the mouth, through which the saliva escaped to an inconvenient degree. It however gradually contracted, and is now entirely closed. At the end of three weeks the patient returned home so far recovered as no longer to require further attendance. She was able when last seen, Jan. 28th, 1873, to articulate with admirable distinctness; and admitted to being free from all pain, and perfectly satisfied at having undergone the operation.

The éraseur used in this operation fulfilled all the requirements of an ordinary wire éraseur, and the combination of the galvanic cautery left nothing to be desired. The only objection to the operation, as performed in this instance, was that occasioned by the heated wire burning the structures in its course into the mouth; and this for the future ought to be obviated by dividing, according to the plan of Sir James Paget, the mucous membrane and structures connecting the sides of the tongue to the jaw, and also the attachments of the genio-hyo-glossi to the symphysis, close to the bone; and when the tongue is thus freed and drawn forwards, by adjusting the wire of the éraseur, so as to include the whole of it close to its connexion with the hyoid bone.

The accompanying electrotype conveys a full representation of the several parts of the galvanic éraseur, as made by Messrs. Krohne and Sesemann. The instrument consists of four separate and separable parts:—*a*, the handle; *b*, a screw on which travels a clamp (*h*); *c*, canulæ through which the wire passes; *d*, platinum wire loop; *e*, ivory "interrupter" to connect or break the galvanic current by slight pressure of the thumb; *f, f*, sockets into which the canulæ can be fixed by screws; *g*, receptacle for connecting wires from battery; on the long screw (*b*) rides the clamp (*h*), between the jaws of which the ends of the platinum wires can be fixed by a screw.

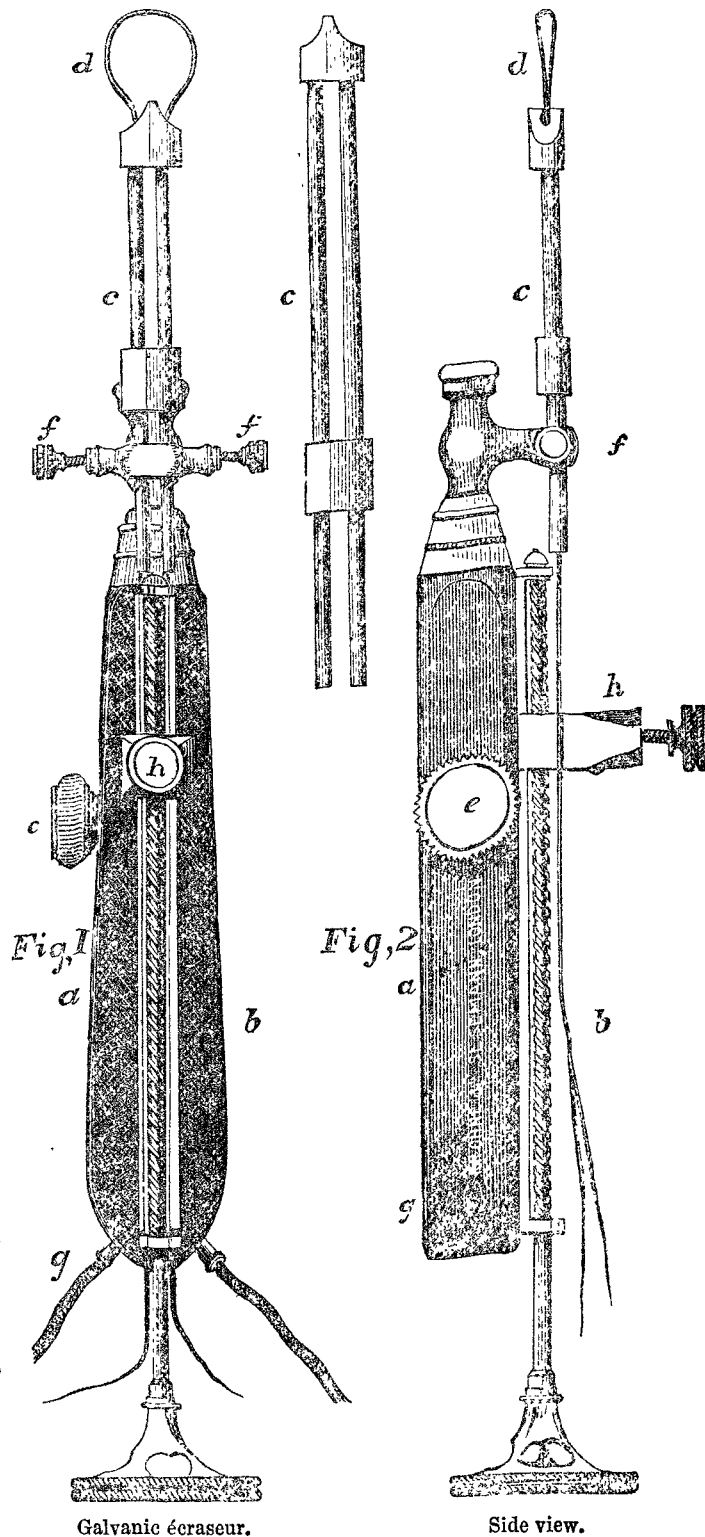
Removal of the tongue in the restricted sense—that is, without attempting the entire extirpation of its deeper attachments to the hyoid bone—is one of almost absolute safety, and invariably followed by an alleviation of the unparalleled suffering caused by cancer of that organ, and it appears doubtful whether the more extended operation is warranted by any adequate benefits that can be fairly promised to the patient. When we take into consideration the great mortality which has followed extirpation of the tongue in its strict entirety, involving as it does either division of the lower jaw or the extensive submental incisions of Regnoli, with a mortality in the former instance of little short of 50 per cent., and in the latter certainly 25 per cent., it requires a full belief that cancer of the tongue may be local in its origin, and curable by removal, to justify the major operation. Regulating our motives and actions by the stern facts gathered by experience, our operations for cancer of the tongue, as in cancer elsewhere, only aim at a mitigation of suffering, and a limited prolongation of life. With this conviction the galvanic éraseur can be recommended as answering every purpose for removal of the tongue.

One advantage over the knife which may be claimed for the galvanic éraseur is the amount of destruction the heat occasions to the structures contiguous to the part removed—an action which cannot fail to modify, for a considerable depth, the tissues which might also be infected with the disease.

A feature in the case recorded worthy of mention is the facility experienced in adjusting the éraseur wire by means of the forefinger of each hand, and the retaining of it *in situ* until the screw of the éraseur is tightened. Various ingenious instruments have been devised to effect this object, but that the most successful of these instruments can be proved as reliable as the finger has yet to be demonstrated. The finger can not only apply the wire, but it can ascertain whether the adjustment is correct; or, if in fault, remedy the mistake before any irregularity can be committed.

The speed at which the screw of the éraseur is turned is of importance, so far as the prevention of hæmorrhage is concerned; and the best rule to follow is—the less the resistance the slower the speed, and *vice versa*, the resistance being in an inverse ratio to the vascularity.

It is the custom of some surgeons not to administer chloroform before the éraseur has been tightened so as to fix the loop round the base of the tongue, with the belief that up to this point there is but little pain, and that the voluntary efforts of the patient materially assist the surgeon. On the other hand, it is asserted that when voluntary as-



sistance is of the most use, the pain caused by manipulation is the greatest, and that after the éraseur is firmly tightened the pain is diminished. Consequently, it is much to be preferred that the patient should be thoroughly under chloroform from the first, when the absence of resistance will be at least equal to any assistance the patient could afford were he not unconscious.

Manchester.

THE annual meeting of the Royal Maternity Charity was held on Tuesday last, when it appeared that 3663 women were delivered under the auspices of the institution during the past year. It must be highly gratifying to all supporters and well-wishers of the charity to learn that out of the large number of deliveries there were only four deaths.