Next, as to the physiological secretions of syphilitic persons—the tears, the saliva, the perspiration, the semen, and the milk. The balance of opinion is against their contagious quality, always supposing them to be unmixed with the products of any secondary lesion. Inoculation with the first three—namely, saliva, tears, and perspiration—has been tried, and has hitherto failed. I do not know that the inoculation of semen has been tried, but I believe there is no instance in which, when the male organs were free from disease, the semen of a syphilitic patient has infected a female in the usual way by the production of an indurated sore. But there is another way in which the semen may possibly convey disease. There are some who think that an infected man, cohabiting habitually with the same woman, may develop a secondary infection in her by the gradual absorption of the elements of the contaminated seminal secretion into her circulation, without the intervention of pregnancy, or any kind of primary lesion. The late Mr. Porter, of Dublin, and the late Mr. Langston Parker have recorded cases in favour of this view. Both are authorities whose opinion deserves attention, and the point is one well worth further consideration. The difficulty in all these cases is that the woman may at some time during the cohabitation have had an indurated sore, which caused her so little inconvenience as to remain unnoticed.

With respect to the milk, it is generally believed that a healthy child suckled by a diseased nurse will not contract disease unless the nurse has some secondary lesion on the nipple or in its neighbourhood;—that the milk itself, in fact, does not convey the disease. It is possible, however, that the milk, although diseased, may, if the child's mouth and lips are free from abrasion, be passed into the stomach without causing any mischief in its transit, and then be so changed by the action of the gastric fluid as to lose its contagious quality. Some experiments do, in fact, throw some doubt on the innocuity of this secretion. M. Voss, of St. Petersburg, has recently inoculated three prostitutes with milk from a syphilitic woman. The milk was injected subcutaneously with a syringe. One of these women was already syphilitic; in her no result was obtained. In another, whose condition as to previous syphilis was doubtful, the result was also negative; but in the third, a girl aged sixteen, who had never had syphilis, papular spots appeared around the inoculated point forty days afterwards, and were soon followed by a general syphilitic eruption.

I do not pretend to offer a decided opinion on these various uncertain points; but I see no reason why secretions, whether natural or morbid, which are formed from diseased blood, should not partake of the contagious quality of the fluid from which they are derived. At all events, the only safe course is to regard every one of them with profound distrust; and to take such precautionary measures, and to give such advice, as the circumstances seem to call for.

ON THE TREATMENT OF SCROFULOUS LYMPHATIC GLANDS BY A PAINLESS ELECTRO- LYTIC CAUSTIC.¹

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THE treatment about to be described for so common a malady as that known as "scrofulous glands," though but another method of attaining an end most commonly aimed at, is, in its *modus operandi*, so different throughout from anything at present employed that it becomes almost a new remedy. A somewhat detailed account, therefore, of its application and action will be requisite; while how far it has been of real benefit to the patients will appear from a perusal of the eight cases in which it has now been employed.

Before describing this treatment, however, the class of cases in which it has been employed, and for which it seems

especially adapted, must be defined. From first to last the morbid condition of the lymphatic glands known as "scrofulous" or "strumous" passes through three very distinct stages, which it is necessary to distinguish, in order to classify the methods of surgical treatment suitable to each case.

In the first stage the glands increase in size, with pain amounting to little more than inconvenience, and with a complete absence of those very acute inflammatory symptoms that accompany their rapid enlargement, which results from the absorption of some irritating material from an adjacent suppurating surface, and which enlargement ends usually in acute abscess. This is not the course of abscesses that result from scrofulous inflammation of the lymphatic glands. To some source of irritation, indeed, the disease may often be traced; and though this may eventually disappear, yet the enlargement continues for months and even years. In this stage the surgeon does not interfere; he trusts to general improvement of the health and to better hygienic conditions to stay the progress of the disease. After a while all may subside, or at once the third stage may supervene; if not, the second stage will be reached, where, active growth ceasing, the swollen and hard glands remain as tumours beneath the unbroken skin, and can be distinguished easily on manipulation; or the whole mass having become agglutinated and encapsuled, a lympho-sarcoma is the result.

Though caustics may be employed for the removal of these gland-masses, yet, especially where they are freely movable or encapsuled, excision is the best treatment. One of the cases I shall narrate was in the second stage, and though a complete recovery followed in seven weeks, without any suffering, yet it would have been even more rapid had excision been adopted. The case was under Mr. Cooper Forster's care, by whose kind permission I am enabled to make use of it.

The characteristics of the third degree of the inflammatory state differ from those that precede it. The glands have now mostly ceased to enlarge, unless they are doing so simply as the result of the irritation occasioned by the more active change going on in their neighbourhood; they are no longer free, but form a mass in which the outline of the original glands may perhaps still be distinguished; but whether this be the case or not, the whole is bound to the overlying skin and to the surrounding tissues by inflammatory adhesions. Hard in some parts, it is red, tender, and softening in others; and here fluctuation may be detected; and then, if the pus be evacuated and poultices applied, the opening, in lieu of contracting and healing after discharging a slough, often remains patent, and a granulating mass protrudes, which may exist, with little or no tendency to heal, for a long time. The treatment in this stage is not that by excision. The patients are generally sickly, and bad subjects for operative interference, even were it possible; but it is scarcely so in many cases, for the glands, now matted by inflammation, often enclose between them important structures. Where however, it is feasible, the measure usually adopted is to incise the overlying tissues and then scoop out all that is removable with a blunt scalpel or spoon-handle. In by far the greater number of patients the only application is a poultice, or simple water-dressing, time being invoked to complete the cure.

Another alternative yet remains in the removal of the glands by caustics; and I shall only mention that by chloride of zinc, for the electrolytic caustic depends upon the formation of this salt for its destructive properties. Chloride of zinc is usually employed as points or arrows, the salt being made into a mass of sufficient consistency by its admixture with flour or gluten. A horny substance is the result, which, cut into wedge-shaped pieces, can be inserted into the part required, a puncture having been previously made with a bistoury. Nothing can be more desirable than the results obtained from this form of caustic. It acts at whatever depth it may be inserted; it destroys the tissues around it; and after some days the remnant of the "arrow" may be removed, and together with it a grey, hard slough; a cavity remains, that gradually fills up and cicatrises. It has, however, in common with all the ordinary caustics, certain serious drawbacks. The patient must be invalided during the treatment, and the pain is very severe during the first forty-eight hours; and this last, in children, becomes a serious impediment to the use of the

¹ Read before the Hunterian Society, March 14th, 1877.

caustic altogether, while unfortunately it is in children that we mostly meet with the condition requiring the remedy.

By employing the chloride of zinc in the way I am about to describe as effective a caustic may be obtained as where the "arrows" are used, and one which is quite painless as a rule. That the caustic should be painless at first sight seems strange; but when we have considered the exact mode of production of the chloride of zinc, taking into account the slight natural sensibility of the parts operated upon, the explanation of this circumstance will be easy. The whole treatment depends upon the production of the chloride of zinc, in the tissues of the body, at the expense of the chlorides in the serum, which are caused to unite with a slip of metallic zinc thrust in at the spot destined to be destroyed. To understand this, I need but recall what happens in a Smee's battery when the electrodes are united and the circuit consequently completed: not only is an electric current established, but the acid uniting with the zinc forms sulphate of zinc, while the hydrogen is evolved at the electro-negative or silver plate. If in lieu of sulphuric acid we employ chloride of sodium, a parallel change takes place: chloride of zinc is formed, and the sodium is set free at the silver plate, and becomes at once oxidised into soda. In this case, therefore, we have, instead of the two inert metals, two active salts; and if any albuminous substance, capable of being acted upon by the chloride of zinc, be present in the solution, it will be simultaneously affected. Let the silver and zinc plates be therefore placed one on either side of a piece of flesh, and be connected together by a copper wire, and the same changes will occur. The flesh is—for our purpose—a firm albuminous basis, bathed in serum or chloride of sodium solution; and the chloride of zinc that is formed, having a powerfully coagulating (and therefore destructive) effect upon albuminoid tissues, will cause marked changes in the space of a few hours. The flesh under the zinc plate will be no longer red, soft, and alkaline, but will be converted into a grey friable material, strongly acid to test-paper; while the presence of the soda under the silver plate may be proved by its strongly alkaline reaction. Each molecule of chloride of zinc, as soon as it is formed, or even in the very act of forming, exerts an influence upon the albumen with which it is in contact, and coagulates it; and it is to this action of the chloride of zinc in a "nascent state"—to use the chemist's phrase,—or, in other words, to its action by successive particles at the moment of their formation, that the absence of pain, when the living body is being operated upon, must be ascribed.

To carry out the plan of treatment of which the above is the theoretical explanation, the surgeon must be provided with some silver foil, at least the thickness of cartridge paper, some of the thinnest sheet zinc (that can be easily cut with ordinary scissors), and some fine copper wire. The zinc is cut into slips of the size required, according to the depth to be destroyed, pointed at one end, and pierced with a hole at the other. A slip, $1\frac{1}{2}$ in. long by $\frac{1}{4}$ in. wide, gradually tapering to a point, is a useful size (*vide* woodcut). To extend its surface it may be bent into a horseshoe, or, if required to destroy a long but narrow surface, the edge of a piece of zinc coarsely serrated may be employed. Whatever form be selected, let the piece of metal pass through a shield of thick gutta-percha or cork, both for the purpose of regulating its length, and to give attachment for the strapping by which it is fixed. The silver foil should be of the size of a shilling, or a little larger, and to the centre of one surface should one end of a short piece of copper wire be soldered; the other end of the wire is thrust through the hole in the free end of the zinc point, and twisted firmly to it. Thus a battery is constructed with its electrodes united and ready for action. Several pieces of zinc may be used in connexion with one piece of silver if necessary. Two raw surfaces must now be selected, one for the insertion of the zinc, the other for the silver. Of course the case, if a suitable one, will present at least one sinus for the zinc, and that for the silver can be easily made, and is best made by raising a small blister in the neighbourhood. When operating on the neck I usually blister over the mastoid bone.

Into the sinus that leads down to the gland-mass the zinc must be thrust until it is firmly embedded in the part that is to be destroyed. The required length can be easily measured beforehand, and the position of the shield regulated accordingly; and so it may be thrust with one stab up to the gutta-percha at once; it is then retained by

strapping. The silver is simply laid on the other raw or blistered surface (the blister having been recently cut, so as to be moist with serum), and there strapped also *in situ*. A battery, with its circuit completed by the copper wire electrode, is thus formed, the exciting fluid for which is the serum in the patient's blood. One caution is necessary—viz., let no solder get on that surface of the silver which is nearest the patient, or a sore will result. As a rule, the

This woodcut represents the electrolytic caustic arranged with two zinc points; also the form of zinc used in Case 7; also the caustic applied. (The apparatus is made by J. H. Sandy, Cooper's-road, Old Kent-road, S.E.)

zinc is sharp enough to enter at once, if not, a bistoury puncture can be made. Sometimes a patient feels the prick of the zinc, but as often not, and then no further pain or inconvenience follows. Four or five days are usually enough for each application. The following changes will then be noted. The blistered surface will be found drier, strongly alkaline in reaction, and in part healed, for under the silver plate cicatrisation of a wound is promoted. On removing the zinc a gray slough will be seen, in lieu of the red granulation tissue before visible, and strongly acid to test-paper. At times this slough will come away with the piece of zinc, or it may be detached with forceps, or, if not loose, it may be removed by poulticing. The apparatus can then be reapplied if necessary, for the same pieces of metal, if kept clean, may be used many times.

(To be concluded.)

ON TRANSFUSION OF BLOOD IN CHRONIC ANÆMIA FOLLOWING INJURY.

By RICHARD BARWELL, F.R.C.S.,

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TRANSFUSION has been employed with great advantage in cases of hæmorrhage, whether post-partum or from wound, but not, as far as I am aware, in that condition of system which may aptly be termed chronic traumatic anæmia—a condition of anæmia and bloodlessness produced by long-continued suppuration and by the waste of reparative processes larger than the patient's strength can support. In such states the sufferer generally eats but little; he may, perhaps, take a fair amount of stimulants, and may have quinine, iron, or other tonics administered. Yet, whether