2. A local shock (puncture) arrests the circulation in the parts to which the nerves affected by it are distributed.

3. A puncture tends to restore the capillary circulation already arrested, to the parts in its vicinity.

4. A puncture exerts its action on the nerves of the part, which is reflected on the branches arising from the same trunks with themselves.

5. The circulation of the capillaries, arrested by a shock, may be restored independently of the influence of the spinal nerves.

6. The spinal nerves, when irritated at their extremities, are capable of arresting, and, shortly after, restoring the velocity of the capillary circulation.

An obvious question arises at this stage of the investigation. Which set of spinal nerves is it that exerts this influence over the circulation of the capillary vessels?

To determine whether the sensitive or motor nerves were concerned, or both, the sensibility, only, of a limb was arrested by acupuncture through the spinal cord, at the dorsal region, and exactly in the median line. By this expedient, not only the sensitive but, in one instance, the excito-motor function ceased, for, on pricking the thighs, not the slightest convulsive movement followed. On examining the circulation, it was found unaltered; nor was it affected by puncture of the webs, an operation unattended by the slightest manifestation of pain. The current appeared somewhat retarded, however, immediately around the puncture. The above experiment was made three times.

The next experiment consisted in arresting the motor function by the introduction of a needle at the roots of the motor nerves on the right side. Paralysis of the right leg followed; sensation remained. On examination of the web it was seen that the circulation, except in the veins, was arrested. It soon returned, the shock being slight, at first in the arteries, and then in the capillaries; creepingly at first, then more quickly; and in a few minutes it was re-established fully. A puncture in the web now retarded the capillary circulation, which, however, was speedily restored.

The arrest of circulation, previous to puncture of the web, in this experiment is probably attributable to a slight shock (ix-1), for the means of arriving at the motor roots are of course painful in comparison with the expedient of puncturing at the median line of the spinal cord.

It may be remarked that the frogs, thus acupuncture, completely recovered their sensitive and motor powers. This mode of experimenting, which is extremely delicate, at the same time merciful, might be adopted to determine the seat of the excito-motory function, and the office of the various departments of the central nervous system. In fact the seat of the lesion can be ascertained after it is determined that this or that function is encroached upon.

The above experiments having been recently performed for the first time, of course require repetition; but as far as they extend, they leave it highly probable that the posterior spinal nerves alone exert an influence over the circulation of the capillaries. The puncture, therefore, which sets up inflammation around it, gives rise to the characteristic changes in the capillaries, primarily,—through the medium of the posterior spinal nerves.

It is a curious fact that the sensitive nerves appear to act locally on the capillary circulation only in the centripetal direction, that is, when the irritant action commences at their extremities. Treviranus and Baumgaertner, as quoted by Müller. (Elements of Physiology, by Baly.) In endeavouring to determine the influence of the nerves on the capillaries have operated on the trunk of the ischiadic nerve. "Baumgaertner," says Müller "directed a strong galvanic current through the ischiadic nerve to the foot of a frog; the irritability of the nerve was destroyed, and in most cases the circulation of the limb was arrested." "Treviranus," continues Müller, "asserted that the division of the ischiadic nerve in the frog caused the circulation in the web of the foot to cease, &c."

Whatever the result may be of this form of the experiment, it is attributable to the general shock to the nervous system (ix-1,) for when sensibility is destroyed altogether by acupuncture at the spine, which is unattended by shock as previously detailed, the circulation is unchanged. The only effect of the experiments of Baumgaertner and Treviranus could be to destroy the irritability of the nerve: but this suspended without a shock, as by acupuncture at the spine, no arrest of circulation follows.

Müller says of himself, "I laid open the spinal canal of a frog, and while my assistant, M. Hoewel applied the wires of a simple galvanic circle to the posterior roots of the spinal nerves, the irritation of which excites no contractions of the muscles, I watched the circulation in the foot of the frog. At the moment when the galvanic stimulus was applied, no change was produced in the motion of the blood. This experiment however is not conclusive, for it may be the anterior roots of the nerves from which an influence on the circulation is derived."

The spinal canal in this experiment must have been laid open some time before the application of the galvanic stimulus, or there would have been no circulation in the capillaries of the web. The effect of a simple circle would scarcely be to destroy the irritability of the nerves; nor therefore to affect the circulation, when applied at the posterior roots of the spinal cord. It has been shown, indeed, in the experiment by acupuncture, that an irritant action may be propagated in a centrifugal direction through the sensitive nerves, and have no effect on the capillary circulation. The concluding remark of Müller respecting the possible influence of the anterior roots of the nerves on the circulation, is met in an experiment already related, which bears upon the point in question. Such are the inductions which the experiments in some measure warrant, but the whole matter being in its infancy, it is stated subject to revision, and a repetition of the experiments in new forms.

(To be continued.)

ON THE USE OF THE CHLORIDE OF LIME IN DISEASES ATTENDED WITH CONTAGIOUS DISCHARGE.

By C. RADCLYFFE HALL, M.D.

Acute or subacute inflammation, after passing through its several stages, however these may be modified in duration and character by a variety of circum-

stances, has a natural disposition to terminate. But the presence of contagious secretion materially diminishes this natural tendency. During the process of nutrition, the fresh molecules of tissue are exposed, as soon as they are laid down, to the infecting influence of the matter already formed, and thus, as it were, a succession of new specific inflammations keeps up the disease. In the treatment of these affections, therefore, it is desirable not only to lessen the inflammatory action which causes the secretion, but at the same time to alter the contagious character of the matter secreted. The first only of these indications seemed to be fulfilled by the topical remedies usually employed. From their peculiar power as disinfectants, the alkaline chlorides naturally suggested themselves as likely to answer both the ends in view; and from its more caustic nature, chloride of lime was selected.

Experiments on the power of the alkaline chlorides to destroy the specific virus of poisonous secretions, are neither numerous nor very well established. Chloride of soda has been mixed with vaccine lymph, without impairing the power of the latter to produce its usual vesicle. But, on the other hand, chloride of soda has been found to destroy the infectious property of the syphilitic poison; and gonorrhœal matter, after admixture with a solution of chloride of lime, produced no puriform inflammation when applied to the lining membrane of the eyelids.

The use of the chlorides in foul sloughing ulcers, and in some skin diseases, as scabies, is familiar; and cases are recorded in which the solution of chloride of lime was found of great benefit in ophthalmia. Dr. Pereira states that a weak solution is very successful in the purulent ophthalmia of infants.

It is not only in ulcers with foul and fetid discharge that chloride of lime is useful. There is scarcely any form of ulceration to which, in different degrees of strength, it is not applicable. To irritable ulcers of the lower extremity, a weak solution, combined with opium, acts as an excellent sedative; to indolent ulcers, a stronger solution; to sloughing or phagedenic sores, a saturated solution proves of equal efficacy. In sloughing phagedena, either of the pudendum, or as cancrum oris, the saturated solution, with the addition of hydrochloric acid, has been found an advantageous substitute for nitric acid, or the solution of nitrate of silver in nitric acid.

Amongst the affections in which great benefit has been derived from the topical use of chloride of lime, I wish to direct attention to gonorrhœa and puriform ophthalmia.*

Gonorrhœa. In the first stage, before the discharge has become completely puriform or the scalding great, a single injection of about two fluidrachms of the strong solution will always put a stop to the disease, either in a first or subsequent clap. In the second stage, when there is considerable discharge of pus and more pain, several injections are required. In gleet, provided the discharge be not kept up by some structural change in the urethra, the strong injection is likewise useful, but not to so striking an extent. The effects of injecting the strong solution, are sharp pain, and often erection for the moment, slight puffiness

and eversion of the orifice of the urethra, and tenderness on pressure, and a feeling of unusual firmness for two, or three inches down the corpus spongiosum, where these did not already exist. In a short time, the pain subsides, and in a quarter or half an hour, a serous discharge issues from the mouth of the urethra. Occasionally, œdema of the prepuce, with its attendant sense of numbness in the part, ensues. There is scalding, but usually not very great, for the first two or three micturitions after the injection; and what there is may be in a great measure obviated by injecting a little almond oil just before attempting to make water. In about eighteen or twenty-four hours, the lips of the urethra are found separated by a clot of firm yellow pus; this is removed by the stream of urine, and may or may not form a second time.

If the disease was only in its first stage, it is now cured; but if more established, the injection will have to be repeated, as often as the peculiar tingling sensation and gonorrhœal secretion re-appear. In this case, the small firm clot is not formed, but in its stead, there is a discharge of more fluid pus. The number of injections, and consequently the length of time required for cure, depend chiefly upon the anterior duration of the disease. In the acute stage of a first attack, where both pain and discharge are considerable, I have never seen any harm from employing the strong injection, using, at the same time, mild aperients, tartarised antimony and opium internally, enjoining perfect rest and abstinence, and frequent washing out of the urethra with some weak astringent solution, as the solution of acetate of lead and sulphate of zinc combined so as mutually to decompose each other. On the contrary, the course of the disease has appeared to be materially shortened. When the inflammation is subacute, but the discharge still purulent, as in persons habituated to claps, or, after a certain period, in a first attack, copaiba or cubebs have been given in the usual way, but the injection has manifestly been of service. In gleet, a single injection has sometimes led to a cure after the failure of almost all other kinds of injection; more frequently, several injections have been required; in a few instances the chloride has entirely failed, but in these cases, no other form of injection subsequently tried has succeeded, and the disease has been cured by the use of bougies, or it has lasted until a fresh clap was contracted, or it has gradually worn out as the patient's general health improved.

The pain caused by this injection is not so great as that attending the use of the strong solution of nitrate of silver; the occasional œdema sometimes alarms the patient, but unnecessarily, as it always subsides in a few hours, requiring only that the patient remain quiet. I have never seen this œdema produce phymosis to any serious extent. Inflammation of the testicle I have not at present known to occur after using the injection; but frequently where the patient had not attended to his gonorrhœa until orchitis had supervened, after removing the latter inflammation, the clap has been effectually treated with the strong solution. I am not aware that its use has ever led to the formation of stricture.

Any strong astringent or stimulant, as sulphate of copper, or zinc, or alum, or nitrate of silver, will, as is well known, if locally applied at the very commencement of the gonorrhœa, frequently put a stop to the

* The liquor calcei chloridi, kept by druggists, generally contains sulphuric acid. The solution I have employed is simply a saturated solution in water.

disease. But all these also will frequently fail. I have never known the chloride of lime fail under these circumstances. One gentleman was cured of seven distinct attacks in the same year by this means.

Puriform Ophthalmia.—The great importance of frequent removal of the matter from the surface of an inflamed secreting membrane cannot be more forcibly illustrated than by the treatment of this disease. In a mild case of the purulent ophthalmia of infants, seen at the commencement, great cleanliness, the frequent removal of discharge, and the application of any appropriate astringent solution, will generally suffice for the cure of the affection. But when the child has been neglected and the disease allowed to run its course for some time unchecked, it becomes perhaps more serious and requires more watchful care than any other inflammation of the eye. In this, as in puriform inflammation of the eye in adults, the application of the strong solution of chloride of lime is of the greatest use. I have only treated one case of gonorrhoeal ophthalmia in this way; but in that the result was equally satisfactory. In one case, purulent ophthalmia in an infant, which had resisted ordinary treatment for two months, was cured in four days by the strong solution. During the same year, the father had been cured by it of chronic gonorrhoea.

In no instance has the eye sustained any permanent lesion that did not already exist before applying the solution; but in many cases, a hazy cornea has become clear, and ulceration and opacity ceased to spread, as the purulent discharge diminished under its use. The mode of using the chloride has been the following:—The eyelids are slowly and gently separated until the cornea can be seen, when that is manageable, and all secretion wiped away with a fine soft sponge. A large bushy camel-hair pencil, charged with the strong solution, is then insinuated beneath the upper eyelid and swept round the front of the eye; the pencil is again charged with the solution and applied to the everted lower lid. Unless plenty of the fluid be thus applied, the application will be equally painful but less effectual. There is considerable pain, of a smarting, burning character, for half an hour or longer, and the already-swollen eyelids become still more tumid and prominent. This tumefaction is cedematous in character, the skin losing in some measure its peculiar redness and becoming more transparent. In a few hours, a serous discharge oozes out from between the eyelids, and the swelling partially subsides. This is followed by secretion of matter, but after two or three applications of the chloride, in perceptibly diminished quantity, the discharge gradually loses its characteristic yellow colour, and is seen in flakes on opening the eyelids. After three or more applications, the eyelids no longer swell as they did after the first, and the pain is much less. As the inflammation lessens, the lids assume a shrivelled, wrinkled, yellowish appearance, and the patient can open his eyes without touching them. The eyes are kept clean with warm water, matter never being suffered to collect beneath the upper lid, a little spermaceti ointment is smeared on the edges of the eyelids, and the strong solution is applied once in every twenty-four hours, until the secretion ceases to be in the least degree puriform. No other treatment whatever is necessary. The longest period

required for cure has been a month; the shortest four days.

I have never seen any injurious effect, such as contraction of the tarsal cartilage, from using the strong solution of chloride of lime; and as it does not destroy the surface to which it is applied, no such result is probable. Having seen the nitrate of silver, with and without the antiphlogistic treatment, employed very extensively, and witnessed its great efficacy in this disease, I believe that the chloride of lime used as above, will be found preferable. Its application is less painful, it cures the disease more speedily, and it never leads to mischief. In being applicable alike in the most acute and more chronic stages, it possesses no advantage over the other.

Holmes Chapel, Cheshire,
December 3rd, 1844.

PROVINCIAL

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We observe that the question of the registration of existing practitioners, is giving rise to considerable discussion, partly in consequence of the misapprehension of the place supposed to be occupied by the newly-created order of Fellows of the College of Surgeons. Some of these gentlemen, it appears, are inclined to consider themselves as surgeons *par-excellence*, and that the members of the College in general, heretofore certified by the Examiners as competent to practise surgery, are henceforth to be considered as of a different class. The subject will be found discussed in an able letter from a provincial surgeon of eminence in another column.

While alluding to the subject of the actual position, as regards registration, of existing practitioners, we may take occasion to reply to a question from a correspondent, requesting us to say how licentiates of the Apothecaries' Company will be registered under the bill. As the associates of the College of Physicians will be entitled to register as physicians, equally with the fellows, it cannot be doubted but that the members or associates of the College of Surgeons would, by implication, be entitled equally with the newly-created fellows of that College, to register as surgeons. The licentiates of medicine and surgery, therefore, if the expression have any meaning at all, must apply to the licentiates of the Apothecaries' Company.