network of the lamina cribrosa, which now appears not only in the centre, but throughout the whole extent of the optic disc. For the same reason, the sclerotic limit and the border of the choroid appear too sharply delineated. If, on the contrary, the atrophy of the optic disc be preceded by an inflammatory process of the retina and the papilla, or the latter alone, the disappearing nerve-fibres are replaced by substance of new formation. This substance is more opaque than the nerve-fibres, and consequently covers the lamina cribrosa, which disappears more or less completely, whilst the contours of the papilla, also more or less covered, appear weaker, undecided, and irregular.

These conditions will furnish you with the most important points on which you will have to rely for your diagnosis, especially if you also consider the state of the blood-vessels. To obtain these observations it is necessary to examine the direct image. In order to be able to examine the direct image without artificial dilatation of the pupil, it is necessary to use a mirror with a sufficiently small and carefully worked hole in the centre. If the hole be nearly as large as the pupil of the patient, it is impossible to throw light enough into his eye. If the margin be irregular, containing little scratches, or if it form a channel instead of a sharp ring, the reflex of light proceeding from this border puzzles the observer by producing entoptic phenomena in his own eye.

A very small part of the mirror only throws light into the pupil—namely, that which immediately surrounds the hole. It is therefore quite useless to use very large mirrors, which are tiresome to the patient, without giving a stronger light to the part of the fundus under observation.

Since I gave these explanations, the diminution of the mirror and its central hole has often been made too great. If the mirror is too small, it cannot well be put against the supraorbital margin, and insufficiently protects the observer against the flame. Too small a hole has two great inconveniences; at first it diminishes the intensity of the light, allowing only too small a pencil of light to pass from the observed to the observer; secondly, it acts as a stenopaic apparatus, and deprives us of our judgment on the refraction of the patient by suppressing the circles of dispersion.

I therefore propose to make the hole not smaller than two millimètres, and the mirror not smaller than three centimètres, and to use in preference a thin silvered glass mirror, the centre of which is not perforated, but only deprived of the silver covering. The focus of the mirror may be of eight or ten inches.

ON THE PATHOLOGY AND TREATMENT OF INTESTINAL WOUNDS.*

By T. D. GRIFFITHS, M.B.Lond., Swansea.

THERE is an interesting case of wounded intestine at present under the care of Mr. Andrew Davies at this hospital, of which the following is a brief history.

L. K., a Belgian, aged about 30, was stabbed in the belly on the evening of the 17th of June last. I and Mr. Jabez Thomas of this town were in attendance on him shortly after the occurrence. The patient was found propped up in a chair, violently sick, with his face ghastly pale, and bedewed with perspiration. He was immediately placed on his back on a table in the room, the head being supported on pillows, and the knees flexed and drawn up, when the small intestines were observed to protrude about two feet through a vertical aperture two inches in length, half way between the umbilicus and the pubes, and a little to the left of the middle line. The protruding gut was distended, greatly congested (a large portion of the mesentery corresponding to the protruding intestine being partially strangulated), and wounded in two places, in the transverse direction. The wounds were in the same transverse line, and evidently made by one thrust of a sharp-pointed knife, transfixing the gut; the larger wound admitted the end of my index finger as far as the root of the nail; and the smaller, the point of an ordinary grooved director. The wounds in the intestine presented a peculiar appearance. They resembled fungous excrescences, circular in outline, and of darker colour than the surrounding serous membrane. The lips of the wounds were everted, and the mucous membrane protruded, giving rise to the fungous appearance, and closing the apertures in the intestinal wall. On introducing the end of my index finger into the larger opening, and afterwards the end of the little finger, with the object of reducing the distension, which appeared to me to be caused by flatus, the walls of the intestine, to my surprise, remained in the same distended state, the reverse of what happens in the distended intestines of a dead subject when punctured. After stitching the wounds in the

intestine, it was found necessary to extend the opening in the abdominal wall from half to two-thirds of an inch, to enable the protruding mass to be returned; some difficulty was afterwards experienced in closing it (the intestines seemed to be more than the peritoneal cavity could contain), which was done by three hare-lip pins and one suture; and, to lessen the tension, two or three long strips of plaster were passed over the hip-bones and round the trunk. After taking thirty minims of laudanum, the patient was removed to the hospital.

Mr. Lloyd, the house-surgeon, with Mr. A. Davies's permission, has kindly furnished me with the following notes of the case since admission to the hospital. "Two ounces of brandy were given to the patient on the night of admission; one grain of opium every three hours for the first three days; one grain every four hours from the third to the seventh day; and one grain every night from the tenth day (June 27th) to the present date (July 5th). The patient was put on barley-water and ice for the first four days; on barley-water, ice, milk (from 1½ to 2 pints), and one egg daily from the 4th to the 17th; and, on the 17th day, rice and minced meat were ordered for the first time. The bowels acted after an enema on the tenth day after admission; also on the tenth and twelfth days; and of their own accord on the fourteenth day. The patient suffered from bilious vomiting for the first five days. With the exception of this sickness, he has had no unfavourable symptom. The wound in the abdomen is nearly healed over, and the patient feels comfortable, but is still confined to his bed."*

This case suggests three special points, to which I desire to call your attention, and from which some conclusions as regards treatment may be drawn.

1. *The Appearance and Character of the Wounds in the Intestine.*—The wounds presented the appearance of fungous excrescences, produced by the protrusion of the fibrous and mucous layers, thus closing the openings and preventing the escape of the contents of the intestinal canal. On thinking over the subject, it occurred to me that the division of the longitudinal muscular layer, which is exterior to that of the circular muscular fibres, might probably account for this peculiar appearance. To satisfy myself on the subject, I made some experiments on a spaniel dog on July 3rd, being kindly assisted by Dr. John Williams. The animal having been put under the influence of chloroform, the peritoneal cavity was opened, the omentum turned aside, and some coils of the small intestines were drawn out. One cut was made by thrusting a sharp-pointed dissecting knife into the intestinal canal, dividing the coats in a transverse direction, to the extent of three-eighths of an inch; immediately the serous membrane began to retract, and in a few seconds the wound assumed the appearance, as remarked by Dr. Williams, of a stoma; the eversion and the protrusion of the fibrous and mucous layers kept the opening closed, and prevented any escape of the contents. The semi-distended condition of the gut was the same before and after the opening was made. The bowel was next opened half an inch in a longitudinal direction; the edges of the wound in this case remained in apposition, or, rather, were inclined to invert; one lip seemed to turn in more than the other. The latter opening was stitched in the way recommended by Mr. Erichsen, by passing the needle through the serous coat some distance from the edge of the wound, and out through the same near the edge, and afterwards passing the needle under a similar portion of the serous membrane on the opposite side of the wound, so as to bring the two serous surfaces into contact. The transverse opening was not stitched. The gut was returned, and the abdominal wall closed by hare-lip pins. The animal having recovered from the influence of chloroform, was given thirty minims of laudanum; the dose was repeated twice during the day; no anodyne was administered the next day. The dog had been well fed up to the time of the experiment, but only water was allowed afterwards. On the morning of July 5th, the dog was again put under the influence of chloroform, and the peritoneal cavity was opened on the right of the middle line, corresponding to the opening made on the opposite side on the 3rd instant. A coil of the small intestine was opened half an inch in a diagonal line; by this section, the longitudinal and the transverse muscular fibres were divided; the whole thickness of the edges retracted equally—that is, without any eversion or inversion; and the wound gaped, allowing the fluid contents to escape. The experiment over, thirty minims of Scheele's prussic acid were poured down the throat, and breathing ceased in two minutes and a half. A *post mortem* examination was made forty-eight hours after the first operation, to ascertain the condition of the wounds. The longitudinal opening, which had been stitched, was covered with a layer of semitransparent lymph; but over the stitches it was more abundant, and of softer consistence, in appearance resembling thick pus. The transverse wound appeared, upon the whole, healthier

* The substance of a paper read before the South Wales and Monmouthshire Branch of the British Medical Association, at Swansea, July 5th, 1871.

† The patient has been reported as "convalescent" since the above notes were given.—T. D. G.

than the other; it was also covered with a semitransparent layer of lymph, which extended over the parts in the immediate neighbourhood; there was no evidence of any of the contents of the intestinal canal having escaped through it. On opening the bowel, it was found to contain a quantity of soft substance where the transverse opening had been made, none of which had found its way between the edges of the wound. It is evident from the above observations, that the appearance and character of the wounds depend upon the direction in which they are made. When transverse, the longitudinal muscular fibres, being divided, retract, evert the edges, and pull upon the fibrous and mucous layers, and thus cause the fungous appearance already described, and fill the opening, and prevent any of the contents of the intestinal canal from passing through. When the wound is longitudinal—that is, parallel to the longitudinal muscular fibres—the transverse muscular fibres are divided, and, by their retraction, keep the edges in apposition, being partly inverted. And when the longitudinal and transverse muscular fibres are both divided, as they must be when the wound is in a diagonal direction, the edges retract and the wound gapes, allowing a free exit to the intestinal contents.

These remarks are only applicable to wounds of the intestines not exceeding half or three quarters of an inch in length.

2. *Distension of the Wounded Intestine.*—It is evident from the history of L. K.'s case, and that of the dog, that, although only partly filled with food undergoing digestion, the intestinal canal may retain a distended appearance before and after it is opened. The peristaltic action observed in the intestines consists of an alternate dilatation and contraction, as well as elongation and shortening of the successive portions of their coat. The dilatation and shortening are produced by the longitudinal, and the contraction and elongation by the circular muscular fibres; the two muscles are antagonistic in their action, and hence the explanation of the dilated or partially distended appearance after the intestinal canal is opened in the living subject. The partial strangulation of the protruding gut and its mesentery may possibly account for the excessive distension observed in L. K.'s case.

3. *The Mode of Stitching the Wounds of the Intestines.*—The method recommended by Mr. Erichsen, and which was adopted in the dog's case, may be objected to on the ground that it materially diminishes the calibre of the intestinal canal, in case of a longitudinal wound, by the folding in of the coat in bringing the serous surfaces into contact; and in case of a transverse wound, the gut is bent by the folding in of the wall on one side, and a transverse projecting ridge is formed in the interior of the knuckle thus formed; all these conditions would obviously render the patient liable to constipation, colic, and intestinal obstruction. The plan that commends itself most to my mind is the interrupted suture. The needle should be passed down through the whole thickness of the intestinal coat, about one-eighth of an inch from the edge on one side of the wound and up on the opposite side. The silk should be tied tolerably tight, so that the soft part included in it may ulcerate more readily, to allow the stitch to drop into the intestinal canal. By this method the wound is closed, the edges are kept in apposition without interfering with the calibre of the gut, and the sutures are removed in the course of a few days.

The continuous suture, and the ligature passed round so as to include the edges of the wound, are methods which, for obvious reasons, need only be mentioned to be condemned.

From the foregoing arguments it may be fairly concluded, that longitudinal and transverse wounds of the intestines not exceeding half or two-thirds of an inch in length need not be stitched, their edges being kept in apposition by the action of the muscular coats—nay, more, that stitching in these cases is a meddlesome interference with nature, which is capable of repairing the breach without the surgeon's aid; and that the only wound which requires stitching is that which is gaping, and is diagonal in direction to the transverse and longitudinal muscular fibres.

THE TRAINING, QUALIFICATIONS, AND DUTIES, OF NUISANCE-INSPECTORS.*

By DAVID DAVIES, M.R.C.S.,

Inspector of Health for Bristol.

No medical officer of health can be ubiquitous; nor can he by himself, however small the district under his superintendence, be thoroughly and always acquainted with the condition of every place in his district—a knowledge which is absolutely necessary for the due performance of the duties of his office. To be always possessed of this knowledge, he must

be assisted by a number of non-medical assistants, who are commonly called "nuisance-inspectors", with whom he should be in personal communication at least once daily. As the success of every health-officer must depend to a considerable extent on the character of his assistants, I will endeavour to describe in brief outline what that character should be, as it appears to me from personal experience.

A nuisance-inspector should be free from all organic disease. He should have passed through small-pox, or have been well vaccinated and also revaccinated, before he commences his duties. He ought also to have passed through scarlet fever, measles, and maculated typhus; and it would be an additional recommendation if he has suffered from a well-marked attack of enteric fever, as I find that one attack of even this disease is to a considerable extent protective from future attacks. He should be largely endued with good health and the natural courage arising from good digestive powers; and, above all, he must possess that "something", indescribable in language, and upon the possession of which we as Englishmen pride ourselves, which impels us under adverse circumstances to do our duty irrespectively of the probable result.

This may be considered a high standard for the mere raw material of a nuisance-inspector, and possibly too high to be found every day or in every place; but I can venture to state that the watch committees of our large towns have always within their knowledge many such characters, whom, however, they are loth and tardy to recommend for promotion, for the simple reason that they do not wish to lose their services as thief-catchers. I may here add that the only literary qualifications requisite, are ability to speak the vernacular language of the district with fluency, and to enter on their journals in intelligible language the most prominent points of their daily occupation.

Such a man having been found, and appointed to office, his special training commences. He must not think that the burden of his duties consists in making himself disagreeable to everybody; in racing after every stray pig or half-starved donkey that may have found (very inappropriately, I confess) lodging in our crowded cities; or that he is to waste his time in listening to the querulous statements of rich old maiden ladies who think they perceived "a smell", as on their way to church on Sunday they passed a street inhabited by poor people, who may have been at the time cooking their potatoes and herrings for a late breakfast. He must not be the handle by which one neighbour can revenge himself on another on account of some petty quarrel between the wives or the children. He must, if taken from the police-force, once and for ever forget that he was a thief-catcher; he must shut his eyes to all that in his former vocation would have roused his inmost spirit, and by so doing he will acquire the utmost confidence of the people among whom his duties chiefly lie; he must learn to believe that the sole object of his duties is to aid in prolonging the lives of the people, regardless of how those lives may be spent. I feel strongly that the duties of a police-officer are totally incompatible with those of a nuisance-inspector. I could substantiate my assertion by facts, but time forbids.

If taken from the police on the recommendation of the Watch Committee, the nuisance-inspector will have learned not to believe all he hears, and at the same time to treat with civility every person making a statement to him. But he must go further than this; as he is no longer a policeman, he should try to prove himself a friend to every one in his district. He should have a great deal of human nature in him; he should acquire the confidence and respect of the clergyman of the parish and of the dissenting ministers; he should be on terms of intimate friendship with the Scripture-reader and the city missionary (most valuable and productive sources of information); he ought to be acquainted with the relieving officers of his district; and, when opportunity offers, he should endeavour to acquire the confidence and good will of members of our own profession practising in his district. They have it in their power to aid him beyond all others when they have the good will to do so. He should make himself acquainted with the owners of all the small tenements in his district, and with their character. His eye should watch every doctor's carriage, every closed shutter, every funeral procession. In friendly conversation with the people, he should find out all that is going on; and in his daily interview with the medical officer, he should report all he has learned and take his advice on it.

He will find on his appointment that he is deficient in many points of special knowledge. He should acquire at least a smattering of natural philosophy. He should thoroughly understand the construction of a good eject or gas-trap; the management of a heat disinfecting apparatus; the nature and application of disinfectants. He ought also (as I think) to be acquainted with the rough outlines and the mode of propagation of the principal zymotics. I am afraid I am treading on tender ground here; but I cannot call any man a nuisance-inspector without this knowledge, as the chief and most dangerous nuisances are the zymotics. This knowledge is easily communicated where there is

* Read before the Public Medicine Section at the Annual Meeting of the British Medical Association in Plymouth, August, 1871.