now. One can but marvel how the surgeons of a century ago managed to perform the operations and secure the results they did.

Human knowledge has its limits, and unless we can prove that man's brains grow larger as the world around him becomes more highly developed, our advance now simply means that we rely more on extraneous aid than in the greater perfecting of men's individual powers. Conversely, it is quite possible that mere mechanical development may have the opposite effect, and the brains shrink as they become less necessary.

In the practice of the art of surgery, as well as in that of medicine, I have often been struck by the clear diagnosis which those who possess a good ear for music often make where others have failed for want of it. Others having mechanical gifts will improvise an apparatus, while another man is wondering how soon he will be able to get an appliance from an instrument maker. In the matter of drawing, again, one who has a good eye for it will usually make a neater, if not a better, operator than the who has not; his lines will be more accurate, and the ends of his incisions will meet at the proper point, and his whole work will be more perfect. So, again, with the sense of touch; this requires a long education, but some never seem to acquire any delicacy of touch—their fingers are "all thumbs," and often they will endeavour to discover by force what can only be made out by the utmost gentleness in manipulation. For example, a movable kidney or other easily displaced tumour can often be made out only by a "surprise touch," and escapes at once from observation with any rough handling. A keen sense of touch is invaluable to the surgeon; a gynaecologist especially is very much dependent upon it for success.

Invaluable as these mechanical aids are, they deal only with one aspect of our work. Medical practice does not consist solely in prescribing medicines and binding up wounds and broken limbs; it has to deal with those in health as well as those suffering from disease and accident; it has to do with moral diseases, moral wounds and weaknesses; and oftentimes the treatment of these is referred to the doctor in preference to that of the pastor—and *a fortiori* that of the legal adviser.

With such cases we have to deal tenderly—it may be a threatened "broken heart" in a daughter, it may be a wasted young life in a son—and in each instance some gentle advice from a trusted medical adviser may save a soul from ruin or reclaim a blasted life. To know how to give wise counsel in such matters can only come by ripe experience. For my own part, I know of nothing in which I feel more satisfied with having lived long, and taken an active part in the world, than that of having been able to give such counsel in matters of the utmost delicacy and difficulty. Spiritual confessions arrive at this, no doubt, earlier but in a different way. They court and seek for the weak side of human nature: with us the weak side is usually the first to present itself, apart from any seeking of ours, and we deal with it as it comes fresh to us, openly, frankly, and fearlessly. We offer advice combined with our sympathy for the weak and erring, our unhesitating condemnation of the wrong-doing, and such advice must command respect. They who fail in this lose the confidence of those who would trust them, and lower the dignity of the profession to which we belong.

REFERENCE.

¹ Hey's *Surgery*, 1814.

THE Mission to Hop-pickers, which originated in a desire to minister to the spiritual needs of the strange multitude who annually journey from the East End of London to the hop fields, chiefly in Kent, affords another instance of the close relation which exists between the work of the medical profession and the Churches. The mission, on behalf of which the Rev. F. G. Oliphant, Rector of Teston, Maidstone, has made an appeal, has found it desirable to provide temporary hospitals and dispensaries for the benefit especially of children. Last year the Kent Nursing Institute lent two nurses to reinforce the work of many volunteers. One of the temporary hospitals is "The Little Hoppers' Hospital," established in a disused roadside public-house at Tudeley; another at Watlingtonbury is in a cottage; others, it would appear, are carried on in tents, but the annual report is not very explicit on this head.

AFFERENT FIBRES IN VENTRAL SPINAL ROOTS.

By LEONARD J. KIDD, M.D.

(Preliminary Communication.)

I HAVE already collected a large amount of evidence—surgical, experimental, histological, and embryological—which seems to me to lead to the inevitable conclusion that afferent fibres, in some cases algetic, in others reflex, exist in the spinal ventral roots of man and many other vertebrates. I hope to publish this work, together with much other work that is connected with it, in the course of a few months. But the practical surgical aspect of this subject is sufficiently important to warrant the publication now of this necessarily incomplete preliminary note.

The operation of division of the dorsal root for intractable pain was first performed by R. Abbe in 1888, and recorded by him in 1896.¹ The records show that in some cases pain is permanently and completely relieved, but G. W. Jacoby² found that in five out of thirteen cases, in which the ultimate result was recorded, though there was improvement, relief of pain was incomplete. E. W. Hey Groves³ has stated recently that in 75 per cent. of cases pain was not completely and permanently relieved by dorsal root section. In one case of his own there was persistence of pain in the areas which the operation had left permanently anaesthetic to all forms of objective stimuli. To my mind this virtually proves that some of the afferent fibres pass centripetally up the ventral spinal roots. We cannot dismiss such findings as his as being due entirely to psychical pain. I hold that these ventral root afferents are few in number, and are probably distributed to muscles, viscera, glands, and (in some lower vertebrates) to skin.

It will be noted that in the case recorded by Chavaunaz,⁴ cited by Groves,³ of severe left intercostal neuralgia which persisted in spite of excision of the corresponding intercostal nerves, a subsequent resection of the left first to fourth thoracic dorsal roots gave only amelioration, but failed to cure. I explain this failure as being due to the fact that the nerve division left the visceral fibres intact, and even the later dorsal root division left some of the afferent fibres—that is, those in the ventral roots—also intact. Therefore the second operation relieved the pain, but failed to abolish it.

In my opinion, we ought to divide ventral as well as dorsal roots in cases of intractable pain, except in the case of the third and fourth cervical ventral roots; here division would cause motor palsy of the diaphragm on the side of section; but, in connexion with this, we must remember that unilateral phrenic palsy in man and laboratory animals does not usually cause danger to life. It is, of course, true that ventral root division for pain would always cause some motor palsy, but the patient would probably almost always prefer this disability to a continuance of his pain. The fact that in some cases dorsal root division does abolish all pain suggests that it may be only in some regions of the spinal cord that any afferent fibres pass up ventral roots to their endo-neural ganglionic groups of cells. I arrived at this provisional opinion many months ago.

Certain experiments appear to me to suggest in the clearest manner that the ventral cervical roots of the pigeon, and the ventral roots of the cauda equina of the dog, contain afferent fibres which supply the reflex component of the muscle-tonus of the wing muscles and the tail muscles respectively. (See on the pigeon, Trendelenburg,⁵ and on the dog, Merzbacher.⁶)

The origin of these ventral root afferents in the spinal cord region, whether cervical (pigeon), thoracic and lumbosacral (man), or sacro-coccygeal (dog), is entirely from endo-neural afferent ganglionic cells, situated, I believe, in (1) the smaller cells of Clarke's column, (2) the solitary cells of the dorsal horn, (3) some of the "middle cells" of the cord, and possibly also (4) some of the cells of the nucleus cuneatus of the bulb. (This special point is one of several which I shall subsequently discuss at full length.)

Readers of my four papers in the *Review of Neurology and Psychiatry*⁷ will be in a position to see that, although I did not discover what I have called the endo-neural

afferent ganglionic system (cranio-spinal), yet I do happen to be the first neurologist to have grasped its wide distribution and its clinical importance in man.

The experimental indications of this subject are clear. By a combination of the retrograde chromatolysis and the degeneration methods the experimental physiologist can settle the points at issue, among which I may enumerate (1) whether all or some of the ventral spinal roots contain afferent fibres; (2) whether any are crossed; (3) whether they rise in the smaller cells of Clarke's column, or the dorsal horn, or the "middle cells," or even in the nucleus cuneatus. Naturally the cervical extension of Clarke's column (C. 3 and 4) and its sacral extension (S. 2 and 3) would be examined histologically in certain cases. There are many other points which I reserve for my full subsequent work.

In concluding this necessarily very incomplete note I wish to say in the clearest fashion that I deny that any motor cells exist in (1) tectum mesencephali, (2) locus coeruleus, (3) Deiter's nucleus, (4) dorsal vago-glossopharyngeal nucleus (ganglion), or (5) in any of the four spinal dorsal-zone cell groups which I have just mentioned. Since all these parts are developed in the dorsal zone of the embryonic brain or cord (the alar lamina of His), and since, further, there is no instance known in any vertebrate of motor fibres rising in cells derived from the alar lamina, I hold that it is nothing less than a morphological outrage to teach that any of these cell groups give origin to motor fibres. I have already explained (*loc. cit.*, February, 1911) that if any experimentalist can demonstrate degenerated fibres of the mesencephalic fifth root (tract) entering the motor-end plates of the muscles supplied by V⁵ a drastic revision of our conceptions of neuro-morphology will be necessary, and we shall then have to teach that the roof and the dorso-lateral walls of brain (and cord) do give origin to motor cells—a view I, for one, resolutely decline to entertain without overwhelming proof of its accuracy. It is, unhappily, true that some of the greatest workers in neuro-physiology have adopted the fundamentally erroneous view that the cells of the tectum mesencephali, dorsal vago-glossopharyngeal ganglion, Clarke's column, and dorsal horn, are, in part, motor. But I can promise that my future complete work will win over all of them to my side. One of them—no less a neurological pioneer than Dr. W. H. Gaskell—at one time (1886) taught that the cells of Clarke's column formed a splanchnic afferent centre, though it is quite true, I think, that he did not even then grasp that it was, in part, a splanchnic endo-neural afferent ganglionic cell-group.

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- ¹ Abbe, *Boston Med. and Surg. Journ.*, vol. cxxxv, 1896, p. 329.
² Jacoby, *New York Med. Journ.*, vol. xxxvii, 1907, p. 192, ³ Groves, *Lancet*, July 8th, 1911, p. 81. ⁴ Chavaunaz, *Gaz. hebdom. d. sci. méd.*, vol. xxvii, 1906, p. 369. ⁵ Trendelenburg, *Arch. f. Anat. u. Physiol.*, 1906 (*Physiol. Abtheil.*), S. 1-126, 34 figs. ⁶ Merzbacher, *Arch. f. d. gesammte Physiol.*, 92, 1902, S. 585. ⁷ *Review of Neurology and Psychiatry*, October, November, December, 1910, pp. 594, 673, 749; and also for February, 1911, p. 62.

PANCREATIC CYST: RUPTURE: RECOVERY.

BY

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THE following case presents some points of interest, more especially with regard to diagnosis and treatment, and from a legal point of view:

History.

J. O., aged 34 years, a labourer in iron works, on January 18th, 1909, was pulling on the jib of a crane, to swing it round, when the jib stuck; instead of getting assistance, he persisted in trying to overcome the resistance, an effort generally necessitating the combined action of two or three strong men, and suddenly experienced a very sharp severe pain in the centre of the epigastrium, causing him to sit down, feel faint, and make the remark, "I have pulled my inside out." Shortly afterwards he partly walked, partly crawled, home. The pain was continuous and very intense, and strictly localized to the one spot. He vomited, was very pale, and obviously suffered from shock.

About an hour after his "accident" he was seen by Dr. Falconer, who found him in the condition described, and made a tentative diagnosis of perforation, probably of the stomach.

He was admitted into the North Ormesby Hospital, and I saw him about an hour later. At this time he had acute abdominal

pain, limited to the epigastrium, which was tender to the touch. Both recti muscles above the umbilicus were as hard as boards—below the umbilicus quite soft—pressure did not relieve him. He had vomited several times, and the bowels had not acted. The temperature was 97° and pulse 60. His face was anxious, and he was obviously not exaggerating his symptoms. There was no history whatever of any previous "indigestion," and his past health had always been very satisfactory.

My first thought was in favour of perforation of stomach or duodenum, but the condition of the pulse and temperature more than two hours after the onset of symptoms (although not negating this diagnosis) stayed my hand from immediate operation, and I decided to watch him for another hour or so.

I was guided in this decision by a general consideration of all his symptoms—his facial expression, suggestive of the acute pain associated with colic, his normal temperature, and pulse, and the fact that his abdominal symptoms appeared to be becoming less imperative. I was inclined, therefore, towards the diagnosis of a very severe colic, or, failing this, the leakage of an old gastric ulcer into a localized area of adhesions, securely shutting it off from the general abdominal cavity.

His condition during the next few days in some way justified my decision against immediate operation. The pain steadily decreased. The sickness stopped. His bowels were made to act by means of enemata, and he felt much better. The contraction of the recti muscles gradually relaxed during the first few hours, and the abdomen generally returned to a normal condition, except for persistent tenderness in the centre of the epigastrium. The urine was normal.

Twelve days later he had so much improved, and all symptoms had so far subsided, that I came to the conclusion that my diagnosis of perforation had been quite wrong, and he was allowed light diet.

On February 11th (more than three weeks after the beginning of his symptoms) quite suddenly there was a return of the pain in the epigastrium, and on inspection a swelling about the size of an orange was seen to push forward the anterior abdominal wall in that region.

I operated at once. A central incision was made in the epigastrium over the swelling. As soon as the abdominal cavity was opened the stomach presented in the wound. There was no free fluid in the general abdominal cavity, and no adhesions between the stomach and the anterior abdominal wall. The stomach itself was perfectly normal, but was pressed forward by some soft, elastic swelling underneath. An opening was made through the great omentum into what turned out to be a large collection of fluid. This was withdrawn to the amount of about two pints, a drainage tube inserted, and dressings applied. The fluid was subsequently analysed and pronounced to be pancreatic fluid.

The subsequent history was uneventful. There was no collapse following the operation, and all tenderness and pain immediately and permanently ceased. The cyst cavity drained for twelve weeks before the sinus finally closed, and his health steadily and progressively returned to a robust normal.

A ventral hernia subsequently formed in the scar, but this has since been operated upon and completely cured by the method of overlapping of the structures of the anterior abdominal wall.

The main points of interest, I think, are these:

I. The Diagnosis.

A consideration of the history, severity of symptoms, and physical signs, pointed more towards perforation of some portion of the gastro-intestinal tract than any other condition, even in the absence of any history of previous intestinal disorder. The condition of the recti with the slow pulse and normal temperature favoured an extreme colic.

In either of these, the story of a severe strain would have to be regarded as merely coincident and in no way contributory.

In the light of after-events, when the diagnosis was positively established, the question arises, Under what condition was the pancreatic fluid existent? Had it been previously present as a circumscribed localized cyst of the pancreas, and if so, had this cyst perforated? or had there been a pre-existing cyst which had suddenly taken on characters of an inflammatory nature? If so, could these possibly have been caused by such an accident, or were they due to the spread of an inflammatory process from the duodenum, and so producing symptoms closely simulating colic of a very intense nature?

In the latter case, could this have been caused by, or aggravated by, such a form of abdominal strain, or must they be regarded as merely and purely coincident? Lastly, there was the alternative of a rupture of the capsule of the gland with a gradually increasing accumulation of fluid in its immediate neighbourhood, forming a cyst for itself by antecedent inflammatory adhesions.

The fluid was limited to the lesser peritoneal cavity, as no free fluid had escaped through the foramen of Winslow. An analysis of the fluid subsequently proved that blood