She was admitted to the hospital on January 22nd, and during her stay of a little over two days her temperature (rectal) never reached more than 97.4°, the heart-rate was (?) 40, 40, 60, 52, 50, 48, (?) 40, and 40 on the occasions on which it was counted, and the respiration-rate on the same occasions was (?) 12, 12, 16, 9, 10, (?) 16, and 10.

She was well developed and well nourished, almost completely unconscious, lay curled up in bed, and resisted all attempts to move her limbs. The breathing, though slow, did not show any periodicity. A faint *tache cérébrale* was elicited. Kernig's sign was obtainable on both sides; attempts to flex the neck did not provoke pain so far as could be told in her semiconscious state. The pupils did not contract briskly to light, and dilated and contracted in slow hippus without apparent cause; the conjunctiva was insensitve or almost so. Occasionally the eyes were kept constantly turned to the right. There was no paralysis of any of the muscles, no spasticity or flaccidity, but general tendency to flexion of the limbs. Occasionally there were slight movements of the arms and fingers. All the reflexes of the arms were absent or greatly depressed. Both knee-jerks and both Achilles jerks were absent, and the plantar responses, when obtained, were flexor; ankle clonus was absent, and with difficulty the abdominal reflexes were obtained in the upper left and lower right quadrants. The eye funduses showed no abnormality of the discs or retinae. Constipation was so marked as to require croton oil for its relief. With difficulty a catheter specimen of urine was obtained, and a good cloud of albumin was discovered on two occasions. There was no sugar. Feeding was carried out by nasal tube. Two attempts were made to obtain spinal fluid by puncture and without success. The difficulty of the case was so great that I asked a surgical colleague to confer with me. We both felt that some intracranial lesion was responsible for the symptoms and signs, and we were greatly influenced by the history of mental change, the pains in the neck, the slow pulse and remarkably slow respiration, the subnormal temperature, and the abolition of reflexes and incontinence of urine. The slowness of the pulse and respiration suggested some subtentorial pressure which was acting upon the medulla. Operation was carried out and the skull opened in the left cerebellar fossa, the opening being continued into the foramen magnum. The dura mater bulged and the cerebro-spinal fluid escaped through a small hole in it at considerable force.

The dura mater was opened freely, and further exploration was deferred until some more favourable opportunity. The opening of the dura mater was promptly followed by a restoration of the breathing to normal—that is, 16 a minute. Unfortunately, however, little else improved, and the patient sank and died within about twelve hours after the operation. I adhered to the possibility of a subtentorial tumour being the cause of the symptoms.

You will scarcely credit it, but the fact remains that the only abnormality found at the necropsy was a mild acute appendicitis, which obviously could not have been responsible for the changes which, beginning two years previously after the fall down the staircase, had culminated in such a curious final picture. The brain revealed no abnormal features, but then it must be remembered that operation with drainage of the cerebro-spinal fluid had probably altered the true condition of affairs. Judging by the clinical features and by the escape at the operation of cerebro-spinal fluid at considerable tension, it seems quite likely, in the absence of other pathological signs, that my patient was an example of Quincke's serous meningitis.

I now will task your patience by one further instance of diagnostic failure. The case is one which personally I feel is a milestone in my progress or the reverse on the road to becoming a physician. Like most beginners I have hitherto felt that molar and molecular death should be accompanied by the discovery of some physical or chemical signs indicative of the cause. In some of the cases I have rehearsed such cause was physical and in others there was reason to believe it was chemical. In the present case I am compelled to admit that the cause was one which conformed to neither, and, for want of evidence to the contrary, I am obliged to admit that at last I have seen death occur, not from anatomical disturbance, including trauma, and not from chemical poisoning, using the term in a broad sense, but from disturbance of vital function by depressing circumstances—indeed, I

have at last seen what might be called a physiological death. I do not say I was ignorant of such possibilities, but simply that I had never had the opportunity of seeing such a case and of verifying it by *post-mortem* examination.

CASE VI.—An Example of Death caused purely by Mental Depression and Excitement.

A gentleman who had amassed a considerable fortune decided at the age of 60 that he would retire from active work and spend the rest of his days in leisure and in the discharge of duties other than personal ones. He had always been a perfectly healthy man, had never known illness, was a keen sportsman, and led a life which was hygienically perfect. He came of a most healthy stock, free from any trace of insanity or mental weakness. When I say that he invested his wealth in one large commercial enterprise at the age of 60 in order to free himself from keeping watch over a multiplicity of investments, it may be questioned whether after all he had not betrayed his one and only departure from mental balance and sanity.

The fact remains that up to this date his business acumen and judgement had been of a first-rate order. The investment he made turned out badly, and though he was far removed from bankruptcy by this turn in his fortunes, he began to sleep badly a month before he died. Restlessness developed and within a week before death he showed his first delusion. Acute mania developed, and without showing any physical signs of ill-health, he died in a second attack of cardiac failure, the first occurring twelve hours beforehand. The *post-mortem* findings were *nil*. Such forms of death are familiar to alienists, but they are not familiar to those of us who do not spend our energies in the care of insane patients. The experience was to me unique, and seems to bring home to me that my diagnostic failures are after all nothing more than confessions of ignorance of pathology, of physiology, or of faulty history taking. This last case impresses me, and will do so for all time, with the fact that mind is superior to matter, that it can triumph over matter—in fine, the “ego” is after all an element which, if robbed of its normal balance, can play havoc with its tenement.

A COMPARISON OF INFLAMMATION AND TUMOUR FORMATION.*

BY

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PROFESSOR RUTHERFORD MORISON has said that “the tissues react to irritation in two ways: by blood changes and cell proliferation.” Inflammation is defined as “the reaction of irritated and damaged tissues which still retain vitality,” or “a series of vital changes which occur in the tissues in response to irritation.” The irritants are either non-infective or infective; the former comprising mechanical, electrical, chemical and thermal agents, and such things as *x* rays, etc.; the latter including the micro-organisms.

Inflammation may be either acute or chronic, though all gradations are met. Both varieties may be produced by the non-infective or infective irritants. When due to the non-infective irritants the type is determined by the severity of the irritation, whereas, when due to the infective irritants, it is generally determined by their nature—for example, acute inflammation is most commonly produced by the pyogenic bacteria, while chronic inflammation is usually dependent upon tuberculous or syphilitic infection. The degree of inflammation depends, in the non-infective variety, upon the quantity of the causative stimulus, whereas in the infective it depends mainly on its quality.

In *acute inflammation* the blood changes are at a maximum, while the local cell proliferation is, speaking roughly, just sufficient for the repair of the tissues damaged in the process. In such a case the cell proliferation may lead to the regeneration of the tissue destroyed, or, as more usually occurs, the damage is

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repaired by the development of fibrous tissue—that is, a scar.

In *chronic inflammation* the blood changes are less marked, while the cellular proliferation is increased and usually in excess of that required for repair. The result of this is the production of tumour-like formations, the *granulomata*, which are responsible for the frequent difficulty in distinguishing between tubercle, syphilis, and malignant disease.

Inflammation, however, is not the only response to irritation which we meet with. Some tumours are undoubtedly the direct outcome of irritation, others present indications of their dependence on such a cause, while in a large proportion of them no evidence is at present to hand as to their mode of origin.

The following are some examples of tumours certainly or probably depending on irritation of some kind for their production.

Lipomata.

In those whose work it is to carry luggage or heavy weights on the shoulders—for example, porters—it is not uncommon for a lipoma to develop at the site of irritation, that is, in the subcutaneous tissue on the back of the shoulder region. These are not all of the nature of bursae.

Subsynovial lipomata—for example, *lipoma arborescens*—commonly occur in cases of osteo-arthritis. Here a chronic irritative condition is present in the joint.

In *adiposis dolorosa* (Dercum's disease) symmetrical deposits of fat develop, usually with pain, as a rule on the trunk. In some of these cases thyroid insufficiency exists, and the exhibition of thyroid extract may relieve the pain and lead to a diminution in size of the fat deposits.

The so-called "diffuse lipoma," perhaps best seen in the neck, is commonly met with in alcoholics.

In this connexion may be mentioned the excessive deposits of fat associated with tuberculous, syphilitic, or malignant foci, perhaps most commonly in affections of the alimentary canal.

In these examples we find lipomata dependent on mechanical and chemical agents for their production.

Fibromata.

A multilobular fibroma has been found arising in the upper jaw, like an epulis, from the irritation of a tooth plate, and keloids are not rarely found at the site of pressure or sustained irritation. These latter are fibromatous or fibro-sarcomatous in nature.

Fibromyomata.

It is common knowledge that "fibroids" are especially likely to develop in the uterus of nulliparous women, and it is also true that, when the ovarian secretion is suspended, as at the menopause or after oophorectomy, they may very much diminish in size or disappear. Such an event would suggest the presence of some substance in the ovarian secretion responsible for their appearance. *Adenomatous enlargement of the prostate*, similarly, may entirely disappear as the result of destruction of the testes, by disease or operation.

Papillomata.

Papillomata present some interesting features in relation to the present consideration.

No doubt is entertained of the infectivity of the ordinary skin wart—*verruca vulgaris*—and the infection may be spread to other parts of the same individual by rubbing, etc., or to other individual, by the common use of towels, and so on. Some infective irritant, which we cannot define, appears to be their direct cause, and the spread of the disease is unquestionably to be attributed to the spread of the infection. There is another variety of wart, in which the skin presents a more or less shrivelled and atrophic condition, associated with chronic irritation—for example, in paraffin workers, after x-ray application, following exposure to sun and weather (sailors), and also in senile atrophy of the skin. In all of these the warts are similar, are apparently non-infective, and, when knocked off, give rise to ulcers, which are very slow to heal and are especially likely to become epitheliomatous. The application of irritating dressings to them increases their activity; bland substances must be used.

Again, other irritants may produce papillomata. Thus infective discharges—for example, gonococcal and in-

testinal—may give rise to them. In gonorrhoea they are seen typically on the vulva and perineum of females and in males round the corona of the glans penis in cases of phimosis; in the case of intestinal discharges they are seen best in the rectum. The removal of the irritating discharge leads to the disappearance of the growths.

In the larynx, in children especially, papillomata are met with apart, so far as we know, from any infective discharge, and tracheotomy leads to their disappearance.

In the secreting glands retention of the secretion often leads to the appearance of papillomata, apparently from the irritation of the retained secretion. Thus, in hydro-nephrosis, from stricture of the ureter, the pelvis and dilated calyces may be covered with small warty growths, and, in the breast, retention of secretion often leads to papilloma in the galactophorous ducts. These examples might be multiplied.

Finally, in adenomata of the glands, especially where cysts develop from the retention of secretion, papillomata are likely to develop. They are seen in adenomata of the salivary glands, thyroid, pancreas, prostate, ovary, testis, and breast. In these cases an infective element is almost certainly out of account. The case of ovarian adenomata with papillomata inside them is of considerable interest. The papillomata may spread through the wall and appear on the peritoneal aspect of the tumours, and subsequently all over the peritoneal cavity. A condition of ascites develops, and everywhere papillomata are seen. Should the offending ovary be removed, all the papillomata may disappear and the ascites entirely clear up.

In the case of the so-called malignant tumours, we can only speak of irritation as a predisposing cause, and I need only mention some of the common examples to bring to mind its very great importance.

The frequency with which sarcoma develops at the site of a recent injury, often severe, precludes the possibility of coincidence.

The irritation which predisposes to carcinoma is chronic in type, and in connexion with it I will quote a passage from Professor Morison's book:

The smoker's lip, the chimney-sweep's cancer, the paraffin worker's ulcer, the x-ray cancer, are popular knowledge. Chronic superficial inflammation (leukoplakia) of the tongue and cheeks, the vulva and penis, so often end in cancer that they are frequently and well described as pre-cancerous conditions. The irritated scar of a burn sustained in youth is certain to develop an epithelioma before the patient arrives at the age of 50. The skin of a face frequently exposed to every variety of weather is likely to develop skin cancer. The breast change described as chronic interstitial mastitis is frequently followed by cancer.

To these might be added the presence of calculi as a predisposing cause of carcinoma of the biliary and urinary systems.

[Mr. Saint here quoted two passages from the leading article on the production of tumours by viruses published in the BRITISH MEDICAL JOURNAL of February 14th, 1914.]

Classification.

For purposes of classification tumours may be divided into non-infective and infective, instead of simple and malignant. The terms are not quite synonymous. The non-infective are comprised entirely of simple tumours, but the infective include not only the malignant growths, but also such definitely infective neoplasms as the papilloma referred to above.

When considering tumours we have to deal not only with the tumour itself but also with the surrounding inflammatory reaction in the tissues. This inflammatory reaction, which doubtless is due in great measure to the presence of the tumour acting as a foreign body, is not wholly so, for, as is well seen in the cancerous growths, it precedes the appearance of any actual tumour. We must thus look upon it as a part of the process of tumour formation, and we therefore see that, even as in inflammation, the process consists of blood changes and cell proliferation, but in this case the blood changes are at a minimum, the cell changes at a maximum.

As inflammation may be either acute or chronic, so also may the process of tumour formation, as evidenced chiefly by the rate of growth. This applies to both non-infective and infective tumours. The tumour itself and the associated surrounding inflammatory reaction vary directly, one with the other, so that in the acute or rapidly growing

tumours a correspondingly acute inflammatory condition surrounds them, while in the tumours of slower growth there is a less acute inflammation. With the slower growth there is necessarily a more definite formation of fibrous tissue, and hence a better defined so-called "capsule," and vice versa.

General and Local Symptoms and Signs.

In inflammation there is a general condition of inflammatory fever, usually absent, or very slight, when due to non-infective causes, and more marked when due to infective organisms. In the tumours a close parallel exists—in the non-infective or simple tumours no general reaction is manifested, while in the infective tumours fever may be present, especially in those described as acute.

The local evidences of inflammation are redness, swelling, heat and pain, and impaired or arrested function. The redness, heat, and pain are, perhaps, especially marked in the acute, while the swelling forms a more prominent part of the chronic variety. In tumours, when slow-growing or chronic, the swelling is all-important, no redness or heat being present; while in the more rapidly-growing or acute types so much redness and heat, and perchance pain, may be associated as to give rise to the diagnosis of an inflammatory condition. This is consistent with what I have said about the associated surrounding inflammation.

The local terminations of inflammation are resolution, fibrosis, or partial or total destruction, which are determined by the degree of interference with the blood supply of the part. The fibrosis is either a primary development or secondary to partial or total destruction, destruction of tissue being for the most part remedied by the development of fibrous tissue.

How do tumours compare with this?

Resolution.—There is no doubt that this occurs. The commonest example we find in the papillomata. I have already mentioned the disappearance of papillomata when the irritant was removed—namely gonorrhoeal warts, rectal and laryngeal growths, and also those in the peritoneal cavity secondary to papillomatous ovarian cysts. It is well recognized, too, that infective skin warts frequently undergo spontaneous disappearance. I have described above the possible disappearance of fibromyomas of the uterus, adenomata of the prostate, and the fatty deposits in adiposis dolorosa. To these I might have added the fat of the diffuse lipomas and also the keloids, which not infrequently disappear when all irritation is removed. But in malignant tumours also examples of resolution are found, perhaps the best in cases of chorion-epithelioma, where removal of the primary focus has led to the disappearance of the secondary deposits. The same may be said for cancer.

Fibrosis.—So much has been said of the part played by fibrous tissue in carcinoma that I need not enter into details concerning it. The perilymphatic fibrosis of Sampson Handley concerns particularly the local extensions of the growth, while the fibrous development in the tumour itself is responsible for many of the clinical signs by which we diagnose the condition. Doubtless the contraction of the increased fibrous tissue formed around the slowly-growing tumours plays some part in the impairment of vascular supply to the tumour, but at the same time we must recognize the tendency for neoplasms to outgrow their blood supply and so to produce a relative ischaemia. This fibrous tissue formation is not limited to cancers, but may be present in non-infective tumours, when of some duration.

Partial Destruction.—In inflammation this is seen in ulceration, caries, abscess formation, and sloughing, and consists in molecular death of the part, or death in very small portions. In tumour growth it is paralleled by degeneration of the tumour tissue, due, as in the case of inflammation, to a more marked impairment of the blood supply than that necessary to produce fibrosis.

Total Destruction.—In the process of inflammation, should the blood supply be completely arrested, the part undergoes total destruction, and the same applies to a tumour—for example, from torsion of the pedicle of an ovarian growth the vessels may be thrombosed and the entire tumour slough off, and the same holds good for extruded uterine polypi, etc. Allied to this we have the degeneration of the tumours in large masses. As in

inflammation, a secondary development of fibrous tissue may follow degeneration or death of a part or the whole of a tumour.

Calcification is no uncommon final stage in the history of an inflammatory focus, generally indicating the successful combating of the cause and the cure of the condition. Further, we know that calcification only occurs in dead or dying tissue. Precisely the same occurs in tumour growth, and when degeneration or death of the growth has occurred, calcification may follow and so cure the condition. Seeing that the malignant tumours mostly progress till the death of the patient is produced, this process is most usually seen in the non-infective growths.

Complications.

The complications of tumour growth form an exact parallel with those of inflammation, and depend upon: (1) Extension of the process; (2) healing, especially the development of fibrous tissue; (3) superadded irritation, especially secondary infection, inflammatory or malignant.

Extension of the Process.—When inflammation is due to the non-infective irritants, extension is limited to an increase in the local conditions, and no general effect is produced. When, on the other hand, it is due to the infective irritants—that is, organisms—extension occurs by: (1) Direct transmission—that is, by the natural passages, by wounds, or contiguity of surfaces; (2) continuity of tissue; (3) by lymphatics; and (4) by the blood stream. In the last type the condition may be one of sapraemia (that is, toxæmia), pyaemia (with the discharge of septic emboli into the circulation), or septicaemia (with organisms free in the blood), while a condition known as acute pyaemia may be present, which is a combination of pyaemia and septicaemia. In the tumours exactly the same conditions are found. In the non-infective tumours extension of the process is limited to an increase in the local conditions—that is, the size of the tumour, whereby the mechanical effects are increased. No general effects are produced. In the infective tumours, on the other hand, the modes of spread are the same as we have seen in inflammation due to organismal infection. Thus we have:

1. Direct transmission—by the natural passages. Rare cases have been described in which a deposit of carcinoma in the stomach has appeared secondary to a primary focus in the mouth or oesophagus, and it is possible that those cases of so called multiple primary carcinomata of the colon may have a similar explanation. Infection by contiguity is less rare, and we have examples in the involvement of contiguous serous surfaces—for example, peritoneum or pleura, in the apposed labia majora, where epithelioma of one side may affect the other, and possibly in those doubtful cases of carcinoma of the penis in the husband associated with carcinoma of the cervix in the wife.

2. Extension by continuity of tissue requires no special comment, seeing that it is so commonplace an event.

3. Extension by lymphatics also requires little comment, except that, while it may occur along any of the lymphatic lines, it does so particularly along that of the main drainage of the part. In carcinoma it is more commonly met than in sarcoma.

4. In extension by the blood stream the analogy to inflammation is maintained. Comparable to sapraemia we have the cachexia of malignant disease. In some cases the patient may die profoundly toxic, and *post-mortem* examination disclose only the primary tumour, uncomplicated by any secondary infection, and without metastases.

The ordinary, so-called "chronic" pyaemia is represented in those cases in which emboli from the primary focus reached the blood stream, some being wholly and some partly destroyed, and some giving rise to secondary foci of disease—a similar sequence of events to that found in pyogenic infections. This blood infection is commonest in the sarcomas, but is also found in the carcinomas.

We find the analogies of septicaemia in the leukaemias, in one—namely, chloroma—associated with greenish deposits of sarcomatous tissue, especially in the skull bones. I remember Professor Murray referring to a case in which a medical man performed a *post-mortem* examination on a

case of Hodgkin's disease, and was himself dead within a few weeks of the same condition. The view taken was that he had been infected at the time of the necropsy, and the acute attack which developed simulated septicaemia. Perhaps, however, I ought not to mention Hodgkin's disease in the present connexion.

Again, there are certain cases which appear to be comparable to the acute pyaemias. In these, while the disease may have progressed slowly for some time, we finally get a rapid generalization of the condition with miliary deposits, affecting perhaps chiefly the skin, or diffused throughout the body, and the patient rapidly succumbs. Such cases may be seen in the melanotic sarcomas, or the carcinomas affecting the secreting glands—for example, breast and pancreas.

Healing.—As in inflammation, apart from the occurrence of resolution, fibrosis, either primary or secondary to partial or total destruction, plays a large part in the cure or attempted cure of the condition. The contraction of the fibrous tissue may lead to the same complications in tumour growth as it does in inflammation—for example, stricture of the hollow viscera with obstruction to the outflow of contents, as in intestinal obstruction, retention of urine, etc.

When tumours occur near a surface, there is a tendency for them to become pedunculated, and this, while curative in essence, may also lead to complications. Thus in the hollow viscera, when pedunculated, their attempted expulsion may cause inversion of the viscus affected—for example, intussusception of the intestine, prolapse of the rectum, inversion of the uterus, etc. In the serous cavities their pedunculation may give rise to torsion. The same remarks apply to inflammatory masses, though perhaps they are affected less frequently.

Secondary Infection.—As in inflammation, the secondary infection may be inflammatory or malignant. When inflammatory, it may cure the primary condition, as is well seen in Coley's treatment of sarcoma, but this is not common. The usual result is an increase of both local and general destructive effects, and often a great part of the cachexia present is due to the superadded sepsis. An example of this is seen in the tuberculous foci, which may be completely eradicated by a secondary infection, but are usually rendered much more virulent and destructive. Again, the development of malignant disease on an inflammatory focus is by no means uncommon. Examples may be found in the occurrence of carcinoma on biliary or urinary calculi, or on a chronic ulcer of the leg or stomach, while one expects an epithelioma to develop in due season on a tongue affected with chronic superficial glossitis.

I need not emphasize the predisposing effect which a "simple" tumour has in the subsequent development of malignant disease, but such a development is by no means uncommon.

In illustration, we may take the affections of bones, especially the long bones, in inflammation and tumour growth, to demonstrate the striking similarity between them.

In young bones—that is, before union of the epiphyses—inflammation, both acute and chronic, commences in the region of the epiphysis, on the shaft side of the cartilage, and may remain limited to this position or ultimately affect the whole shaft. Thus we see it in acute septic osteitis, in tuberculous and syphilitic disease, and in the last especially is the tendency to spread to the shaft marked. In the tumours also, whether simple or malignant, the same region is involved. Thus exostoses, which are the commonest simple tumours, are found here; and sarcoma, whether myeloid, endosteal, or "periosteal," is similarly situated. Further, not only is this region common to both conditions, but the same ends of the same bones are more especially chosen in both—that is, the more active epiphyses. Thus, the commonest parts to be affected in both inflammation and tumour growth are the upper ends of the tibia and humerus, and the lower ends of the femur and radius.

In adult bones, on the other hand—that is, after union of the epiphyses—in neither inflammation nor tumour growth is the epiphyseal region specially selected; and further, in both, whereas previously the bone itself was particularly affected, the subperiosteal tissue is now the most involved. Thus, in acute inflammation, we no longer have the typical acute osteitis mentioned above, and the

best example of a blood infection, which is rare, is the pyaemic deposit in typhoid fever—that is, the typhoid node. This is usually about the middle of the shaft, and subperiosteal. Similarly tubercle, when it affects adult bones, occurs as a subperiosteal deposit, and does not choose the epiphyseal regions particularly. This is best seen in tuberculous disease of the spine. Further, syphilis is manifested most commonly in the subperiosteal gumma, which chooses the region of the middle of the shaft of the long bones. In sarcoma the same remarks hold good, and in adult bones quite a large proportion are found away from the epiphyseal ends. The tumours are mostly classified as osteo-sarcomas, and here again the subperiosteal tissues appear to be affected most. This was very well demonstrated in Mr. James's Berry's address before the Northumberland and Durham Medical Society last year, when almost all the sarcomas in adult bones were situated away from the epiphyseal ends.

THREE CASES OF TRAUMATIC RUPTURE OF THE SMALL INTESTINE.

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THERE is a common belief that the more rare conditions met with at hospitals turn up in runs of three. Those who hold that view will find support for their view in the fact that we have had three cases of traumatic rupture of the small intestine in Oldham in three months. These cases are also of interest on account of the fact that they had many features in common.

CASE I.

A young, strong collier was about to send a tub of coal down an incline in a coalpit when the tub got foul of the line; he stooped down to put matters right, when suddenly the tub started to go, and the rope which was attached to the rear of the tub got entangled round his arm, and he was dragged along the ground to the bottom of the incline. He was taken to the Oldham Royal Infirmary, and found to be covered with superficial abrasions. He complained of abdominal pain, but before his symptoms became, in my opinion at that time, sufficiently clear to justify operation he died, and at the *post-mortem* examination the jejunum was found torn completely across within a few inches of the duodeno-jejunal junction.

CASE II.

A strong man in the prime of life at night attempted to board a rapidly moving electric tramcar. He was seen to seize the handle, but missed his footing; he was dragged by his hands for some distance, and then let go and fell to the ground. He got up and proceeded on foot on his journey, a distance of some two miles. He then became acutely ill and died. At the *post-mortem* examination it was found that the trunk of his body was free from the slightest external sign of injury, but a transverse rupture of the small intestine, within a few inches of the duodeno-jejunal junction, was found.

CASE III.

A man of about 30, a fine specimen of physical humanity, was engaged unloading bales of cotton from a lorry, his duty being to fix two hooks into the bale and, when clear of danger, to shout to another man, who set machinery in motion, first, to wind the bale into the air, and then into the factory. He had fixed the hooks when, before he had got clear, the other man commenced the winding process. The patient clung to the covering of the bale, was lifted by his arms into the air, and fell to the floor, a distance which I could not ascertain; the patient himself said about the height of the hospital ward, but on this point the witnesses were not in agreement; he could not, however, have fallen far, because the only external injury he received was a slight bruise over the malar bone and a little discoloration of the corresponding eye.

He was admitted to the Oldham Royal Infirmary, and I saw him within an hour of the accident; he complained of abdominal pain. There was a suspicion of rigidity in the upper part of the abdomen; the pulse was good (64), and there was nothing more, to suggest internal injury. I saw him again three hours later; the rigidity was more pronounced, he had vomited, but the pulse had not appreciably altered.

I determined to operate, more as a precautionary measure than because I could make any, even an approximate, diagnosis. On opening the abdomen above the umbilicus I soon found a transverse rupture of the small intestine within a foot of the duodeno-jejunal junction; the rupture extended about two-thirds of the circumference of the bowel, and about $\frac{1}{2}$ in. above it there was another partial rupture extending half the circumference of the bowel, but only through the peritoneum and not through the muscular coats. I closed the ruptures, the one in three layers and the other by a single layer of sutures, dry mopped the peritoneal cavity, and introduced a suprapubic