beside me, if he ever saw a case of scurvy in a child in the West of Ireland, and he replies that he is glad to say that the people there are not yet sufficiently "civilised" for their children to be even rachitic. Yes, civilisation is certainly not an unmixed blessing. Not very many years ago rickets was unknown in America; now there is plenty of it in certain parts of New York and other large cities. So also with Victoria and New South Wales; with the introduction of civilisation rickets has made its unwelcome appearance in Melbourne and Sydney, and the fear is that it means to stay. Rickets must, therefore, no longer be considered "the English disease."

REFERENCES.

- ¹ The Bradshaw Lecture, BRITISH MEDICAL JOURNAL, November 10th, 1894, p. 1031. ² Smith, Elder, and Co., 1894.

THE HARVEIAN LECTURES ON THE SURGICAL TREATMENT OF TUBERCULOUS DISEASES.

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LECTURE II. TUBERCULOUS PERITONITIS.

[AFTER some remarks on acute tuberculosis of the peritoneum, the lecturer went on to describe the following chief types of lesions which may be found in cases of tuberculous peritonitis:]

VARIETIES.

1. The peritoneum may be studded with tubercles of varying size, some small, greyish and transparent (the ordinary miliary tubercles) others larger and tending to become cheesy. These tubercles are scattered over both the visceral and parietal peritoneum, and there are frequently patches of fibrinous exudation over them which readily peels off, and in the early stage there is not necessarily any matting together of the intestines or shrinking or adhesions of the omentum or mesentery. The peritoneum is usually markedly hyperæmic. In these cases there is almost always more or less fluid present in the abdominal cavity, usually of a lightish straw colour, but in more acute cases somewhat opalescent or stained with blood. The sensation on putting one's finger into such an abdomen is the same as if it were passed into a bag of sago.

The tubercles are not usually distributed over the whole cavity, but are most numerous in patches, and this is more especially the case where the origin of the tuberculous peritonitis is some tuberculous lesion inside the abdominal cavity. For example, in peritonitis originating from the tubes, the tubercles are most numerous in the pelvis, and become less numerous as one passes from it; or, again, in tuberculous peritonitis originating in connection with tuberculous ulcer of the intestines, the tubercles are in the first instance most numerous over the intestines in the neighbourhood and less numerous elsewhere.

Although, as has been said, in these cases the intestines are not usually matted together, still in some instances the fibrinous exudation produces sufficient adhesion to prevent the free spread of the fluid over the whole abdominal cavity, and thus we may have one or more collections of fluid simulating cystic tumours.

2. In a second set of cases the formation of adhesions and fibroid induration of the omentum and mesentery are the marked features. The intestines become bound together in masses by new fibrous tissue in which miliary tubercles may be present. These adhesions are often very firm, and may in parts constrict the intestines, or in other parts, from their shrinking, lead to kinking of the intestine, and in both ways they may cause partial or even complete obstruction. Further, the intestines are not only adherent to one another, but they are also very apt to contract adhesions to the abdominal wall, and this forms a great difficulty in performing laparotomy in these cases, and it is also the great objection to aspirating the abdomen where fluid is present. Where the whole abdomen is involved these adhesions are especially marked

between the liver and diaphragm. The omentum is also early involved in these fibroid changes, the two layers of the omentum become matted together, and the whole structure becomes much thickened and shrunken, and in an advanced stage forms a thick rolled-up mass like a sausage lying about or above the level of the umbilicus, and usually running more or less transversely across the abdominal cavity; it is generally adherent to the abdominal wall at this part. This thickened omentum contains numerous tubercles in its substance and scattered over its surface. The mesentery is also markedly affected with similar changes, and becomes thickened and shrunken and drags the small intestine up towards its root, and thus it comes about that when fluid is present it is most apt to collect towards the left side and lower part of the abdomen. The mesenteric glands are also enlarged, but not as a rule cheesy.

In these cases a certain amount of cirrhosis of the liver may be met with, or there may even be tubercles in the substance of the liver. The spleen also is not uncommonly enlarged, either as the result of passive congestion or hyperplasia, or in some cases from the presence of tubercles. This adhesive form of tuberculous peritonitis may or may not be accompanied by the presence of fluid, and where fluid is present it is most often encapsuled, and there may be more than one collection.

3. A third condition which may be present, and one which is extremely grave, is that the tubercles run together and form large masses which undergo caseation; the mesenteric glands are enlarged and caseous; the omentum is often converted into a caseous mass, and caseating masses form in the adhesions which bind the intestines together. The contractions and distortions of the intestine and the shrinking of the mesentery and the other changes mentioned under the second form are usually much exaggerated. This condition is especially associated with intestinal ulceration, and the intestine is usually thinned, and may even be perforated. Collections of fluid are frequently present, most usually encapsuled and multiple, and not uncommonly purulent. The pus may present all the characters of ordinary tuberculous pus, but in other cases it may be foul smelling, either as the result of infection through the intestinal walls, or as the result of actual perforation of the intestine. In this form, in infants especially, the condition may be most marked in the neighbourhood of the umbilicus, and the pus may make its way through the abdominal wall at this point. Where this occurs we find a sinus passing into the abdomen, and not uncommonly a fecal fistula is present as well. As this fecal fistula is usually in the small intestine, and often pretty high up, the child rapidly emaciates and goes down hill.

In both the second and the third forms the upper part of the abdominal cavity may be healthy, the disease being shut off above by the adhesion of the omentum to the abdominal wall at the level of the umbilicus. In other cases it may be still more circumscribed, and form a limited patch with fluid in the interior, this condition being most commonly met with in the form of an irregular fluctuating swelling in the left iliac fossa. Another local form is where it is limited to the pelvic region, which occurs especially in connection with infection from the Fallopian tubes; or, again, we may meet with a tuberculous perityphilitis forming a mass in the right iliac fossa, which has been mistaken for a malignant tumour. These masses are usually secondary to tubercle of the appendix or cæcum.

There are many intermediate forms and varieties of these pathological changes which it is impossible to enumerate here, but these are the three chief types, and they are of especial importance from the point of view of treatment.

ETIOLOGY.

[As regards the etiology of tuberculous peritonitis, the lecturer pointed out that it usually occurred in the course of tuberculous disease elsewhere, such as phthisis, tuberculous diseases of bones and joints, genito-urinary tuberculosis, etc., but in some few cases it has been the only tuberculous lesion discovered, and may therefore be looked upon as of primary origin. Judging from a number of published statistics, the frequency of the primary forms as compared with the secondary is something like 2 to 10 per cent. In these primary cases it has been supposed that the bacilli enter through the wall of

the intestine and thus reach the peritoneum, but it is most probable that they are deposited from the blood in some part where the resisting power has been diminished as the result of injury or other cause.

As a secondary disease tuberculous peritonitis may follow either some intra-abdominal condition or some tuberculosis elsewhere. Of the intra-abdominal conditions the most common are tuberculous ulcers of the intestine, tuberculous disease of the genito-urinary system, especially of the tubes in females, tuberculous mesenteric glands, tuberculous appendix and cæcum, etc. Many look on intestinal ulcer as one of the commonest causes of tuberculous peritonitis. A fair estimate of the frequency is about 20 per cent. The form associated with intestinal ulcers is usually the caseating form, and the most serious one both as regards the condition of the patient and the chances of recovery. Another common source of infection is the Fallopian tubes, a considerable proportion of the cases in women having their origin from that source. The tubes become enlarged, hard, and tortuous, and form thick sausage-like tumours containing cheesy material, with their walls dotted with tubercles; they usually fall back into Douglas's pouch, and become adherent to the structures there. Some have supposed that the tubal disease is secondary to the tuberculous peritonitis, but the reverse seems to be the most common cause.

Of the extra-abdominal sources, tuberculosis of the lungs occurs in something like from 25 to 30 per cent. of all the cases, while tuberculosis of the pleura is not uncommonly associated with the disease. It is most common in children and young adults.]

Sex.

As regards sex, a very curious result is obtained according as we take the statistics of cases operated on or of cases examined *post mortem*. If the statistics of surgeons are taken, the great majority of the cases occur in women. For example, taking at random three sets of statistics, Lindner publishes 186 cases, of which only 21 were males. Lindfors published 109 cases, of which only 9 were males; and König publishes 130 cases, of which 10 were males. This difference, though still maintained, is not so marked in children. Thus, in Aldibert's tables, I find 106 adult female cases and 11 males, while in children there are 30 females and 17 males.

On the other hand, if we take the statistics of the *post-mortem* room, we find a larger number of cases in males than in females. Thus Vierordt in 24 cases had 19 males and 5 females. König in 108 cases had 89 males and 19 females, and Schmalz in 54 cases had 33 males and 21 females.

How these results are to be explained is very difficult to understand. We must, I think, assume that a much larger proportion of female cases come to operation than males; and if this be true we must also, I think, conclude either that the disease is much more readily recovered from in females than in males, of which there is no evidence, or else that operation has a remarkably beneficial effect upon it. That the latter is true will be evident when I come to consider the results of operation, and it must also be true that a much larger proportion of females are submitted to operation than are males. Many of these operations have been and are done from mistaken diagnoses or for exploratory purposes. The mistaken diagnosis is most usually an ovarian cyst, and hence it occurs only in females, and, besides, in women the abdomen is more often opened, and the proposal to do so is more often acceded to, than in men. Then also women with enlargement of the abdomen are more likely to come under the care of the gynaecologist and of the surgeon than men, and the surgeon thus chiefly sees cases of localised tuberculosis simulating tumours, while the physician sees cases of diffuse ascites and others which do not so often come under the care of the surgeon. To some extent also the difference between the two sets of statistics may be taken to represent the relative value of medical and surgical treatment, the patients not operated on appearing much more often on the *post-mortem* table than those who are.

SYMPTOMS.

¶ The commencement of the disease is usually insidious and slow, although in some cases it may be rapid, and may then be mistaken for typhoid fever, tuberculous peritonitis, etc. In most cases the early symptoms are quite indefinite. The

patient has a feeling of *malaise* and weakness, he is subject to headache, may suffer from thirst, does not sleep well, and frequently has night sweats. He soon begins to lose his appetite, feels out of sorts, and not uncommonly has occasional vomiting. The bowels are irregular, he frequently suffers from obstinate constipation or from diarrhoea, or again from alternate constipation and diarrhoea. By-and-bye he begins to have occasional abdominal pain, especially of a shooting character, or, it may be, only a feeling of weight or pressure. In other cases there is no pain at all; indeed, it is very seldom that pain is severe at the commencement of the trouble. The pain if present is increased by exertion. The temperature is very variable; there is generally an evening rise but it may not be marked; in a good many cases there is no rise at all, the temperature being normal, while in others again, after it has been normal for some time, it may suddenly commence to rise in the evening and assume a marked hectic type. In the early stage, except in the acute cases, the patients are able to go about, or even follow their employments, but from time to time they may have to lie up on account of feeling out of sorts, or of general weakness, or of increasing pain, and then, after a few days' rest, they are able to go about again. After some weeks or months, however, the patient has to give up work either on account of increasing weakness, or more commonly on account of gradual swelling of the abdomen, a feeling of weight, or more rarely severe pain, shortness of breath, etc. As the disease goes on the general symptoms increase, there is rapid advance in the malnutrition and emaciation, the skin becomes pale and sallow and dry, the cheeks sink in, and the patient acquires the suffering aspect of those with abdominal trouble. In others, again, the symptoms are much more acute, and in a considerable number of cases they have been mistaken for those of typhoid fever.

On examining the abdomen the condition of matters present depends on the pathological changes already described, and to a great extent also on whether there is or is not fluid, and on whether the fluid is free or in loculi. Where there is much free fluid present, the abdomen is distended, somewhat flattened at the sides, and the ribs everted. The abdominal wall is stretched and shining, with big veins running over it, and it is usually so tense that nothing can be felt through it. The pain is not generally marked in these cases. Where the fluid is less, the thickened omentum is readily felt in the form of a tumour-like mass of a sausage shape, generally running more or less transversely across the abdomen about or just above the level of the umbilicus, the omentum being thickened and rolled up by the fluid and the distended intestines, and pressed against and becoming adherent to the abdominal wall. The percussion note is uncertain and atypical, fluctuation is not distinct, and the fluid as a rule only changes its position slowly, owing to having to make its way among the adherent intestines. Under other circumstances, again, the fluid may be more or less completely encapsuled and form definite fluctuating tumours, which may be mistaken for ovarian or other cysts. On the other hand, there may be little or no fluid present; the coils of intestine become adherent, the mesentery contracts, the omentum is thickened and shrunken, and hard bands and thickenings are found in the abdomen. Thus one may not only feel the thickened omentum, but also definite patches of hardness elsewhere, due to these bands and thickened adhesions, or one may find more definite hard tumours which are generally composed of masses of glands or of thickened adhesions studded with tubercles, or of small collections of encapsuled fluid. The abdomen is uneven, owing to irregular distension of the intestinal coils with gas. There may be marked meteorismus, and, when the intestine is kinked or in any other way obstructed, the coils of contracted intestine may be seen through the abdominal wall. In the latter case, of course there would probably be other signs of obstruction. The splenic dullness, if it can be made out, may be increased. The liver dullness is not commonly diminished, but, on the other hand, the liver may be enlarged as the result of early cirrhosis or fatty infiltration. There is often decrease in the quantity of the urine, and not infrequently albuminuria. The stools are frequently light in colour, due to imperfect digestion of the fat.

It is not uncommon for the disease to be associated with various complications, more especially with intestinal obstruc-

tion due to kinking, bands, or narrowing of the lumen in connection with ulceration; or, on the other hand, perforation may occur, either through the ulcer or above an obstruction; or, again, we may have inflammation and thickening around the umbilicus, especially in children, which has been already referred to, and which is pathognomonic of tuberculous peritonitis. In bad cases belonging to Type III, where suppuration is present and emaciation usually rapid, there is generally considerable fever, and the patient quickly goes down hill. It is not uncommon for the disease to be combined with phthisis, or with pleurisy. Schreiber gives 26 cases, of which 12 had already tuberculous pleurisy; and Heintze in 25 cases had 20 with pleurisy. Although not as a rule so frequently present, pleurisy is nevertheless not at all an uncommon accompaniment; it may precede the peritonitis, or the two may begin simultaneously, or more commonly the pleurisy comes on after it. It often sets in insidiously, and in any case it is grave and increases the dyspnoea.

Prognosis.

[After some remarks with regard to the diagnosis of the disease, the lecturer went on to consider the prognosis where no surgical intervention has taken place. On this point authors are not quite in unison, the older authors looking on the disease as almost certainly fatal, and considering that the cases which recovered were not tuberculous, whereas of late views have become more favourable, Herringham, indeed, looking on the disease as one in which the prognosis is not at all bad unless complications are present. According to statistics put together by Pick some years ago with regard to children treated medically, the diffuse form (Form I) was always fatal; the caseating form (Form III) was fatal in 70 per. cent. of the cases (where suppuration was present the mortality was 82 per cent.; where it was absent it was 52 per cent.); the fibrous form (Form II) was fatal in 17 per cent. (of these the dry form was fatal in 14 per cent., and the ascitic form fatal in 19 per cent.). Pick's actual figures were 67 cases in all; of these, 27 died, 5 steadily got worse, 11 remained *in statu quo*, 21 improved, and 5 were apparently cured. The lecturer thought that these statistics probably gave very fairly the prognosis in cases treated without operation. Some remarks were then made about the medical treatment in these cases, after which the lecturer went on as follows:]

SURGICAL TREATMENT.

The value of surgical measures was found out quite accidentally. In 1862 the late Sir Spencer Wells, in operating on what he supposed to be an ovarian cyst, found on opening the abdomen that he had before him a case of tuberculous peritonitis. He therefore at once closed the wound again, but to his surprise the patient soon began to improve, and ultimately got well, and was alive and well twenty-five years later. As abdominal surgery became more and more developed, similar mistakes were frequently made, and further, as exploratory operations were introduced, tuberculous peritonitis was not uncommonly discovered. It was found that in a considerable number of cases after such mistakes or explorations, the patients rapidly got well, and by-and-bye it became clear that this could not be regarded as a mere coincidence but that laparotomy had a distinctly beneficial effect in a considerable proportion of cases of tuberculous peritonitis. Hence surgeons began to perform laparotomy as a curative measure in cases which were diagnosed as tuberculous peritonitis, with results which have established it as a highly successful means of treatment.

Statistics.

König was among the first to bring this plan of treatment definitely forward; in 1884 he wrote a paper on the subject, and in 1890 he collected from various sources 131 cases, with the following results: 8 died from the operation, mostly as the result of shock; 16 died some days or weeks later, chiefly as the result of extension of the disease, giving a mortality, immediate or remote, of 24, or about 19 per cent.; 23 improved, and 84 were apparently cured. In 48 of these latter cases a year had elapsed since the operation; in 30 over two years; and in 3 more than six years. Maurange gives statistics of 71 operations, with 6 deaths from the operation, 7 deaths from generalisation of the disease, and the remaining cases

were successful, the improvement being confirmed in nearly half the cases one year or more after the operation. In 87 cases by Pick and Maurange in which sufficient details are given there were 7 deaths from the operation, 10 deaths from generalisation of the disease—17 in all, or nearly 20 per cent.—and 28 of the remainder were well a year or more after the operation. Roersch (quoted from Voigt) in 1893 put together 358 cases, of which 20 died, apparently from shock; 1 of acute bacillary peritonitis; 1 of intestinal fistula; 10 of septic peritonitis; and 51 within eighteen months, of extension of the disease, such as general tuberculosis, tuberculous meningitis, marasmus with stercoral fistula, etc., some of these having shown temporary improvement; in the remainder improvement followed, and in a large number there was apparent cure. For example, in 53 cases two years and upwards had elapsed since the operation, and the patients were apparently well.

Many other statistics might be given, but these fairly represent the results obtained, and show that of published cases of tuberculous peritonitis something like 75 per cent. are improved or cured by laparotomy. Whether this represents the real state of matters is, however, very doubtful, because statistics made up of isolated published cases are certain to be one-sided, for the publication of a successful case does not imply necessarily that no other cases were operated on, and, if they were, the results were probably not so good. My own experience and the study of numerous complete statistics of small numbers giving all the cases operated on would lead me to reduce the above favourable figures considerably, and I should say if all cases of tuberculous peritonitis were operated on (not merely selecting those that are most favourable), 50 per cent. would probably be the outside limit of improvement or cure as the result of the procedure. On the other hand, if the more favourable cases only were treated by laparotomy the percentage of successes would be much higher. It is well to add also that although laparotomy may fail on the first occasion, a repetition of it, especially if the fluid has reaccumulated, may be followed by success. Thus D'Urso repeated the operation four times in the course of seven months, and after the fourth time success was obtained. Richelot likewise repeated it four times in the course of two years with ultimate success, and others have repeated it successfully on two or three occasions; hence a failure where the fluid tends to reaccumulate should not discourage one from making a second attempt.

Cases Suitable for Operation.

While, taking all cases together, the above is the average result, there is no doubt that some forms of the disease are more amenable to surgical treatment than others. Opinions differ very much on this matter, some saying that it may do good in all forms, and others that it is only in the fibro-adhesive form with ascites (No. II), especially where the collection of fluid is localised, that it is of any use. Some also point out that it is useless where there is ulceration of the intestine, or where the disease is secondary to tubal disease, whether the tubes are removed or not. The most complete attempts to work out this point have been made by Aldibert and Roersch, and though the results have been often quoted, I may introduce them here. I have arranged Aldibert's first three groups in tabular form, and have worked out the length of time during which these cases were under observation. (See Table.) The *post-mortem* appearances described in my first group correspond to Aldibert's Groups I 1, 2 and 3 and II 1. The changes described under the second heading correspond to Aldibert's Groups I 3b and II 2; and the changes described under my third heading correspond in part to Aldibert's Group III.

Aldibert also refers to 4 cases in which the abdomen was opened and enlarged mesenteric glands were found. In 3 of these recovery took place, but in 2 of them the length of time during which the cases were under observation is not given (in both of these some of the disease was removed). In one, where the abdomen was simply shut up again, the case was well eleven months later. One case died of septic peritonitis. He also gives 14 cases of intestinal obstruction in connection with tuberculous peritonitis, of which 5 died from the operation, and 4 subsequently of the disease; 5 recovered, but in only one instance was the patient under observation for

ALDIBERT'S CASES TREATED BY LAPAROTOMY.

TABLE A.—Children up to 16 Years of Age.

	Total.	Died.		Recovered.				Not Improved.
		Of Operation.	Later.	Traced for One Year and Upwards.	Traced for Six Months to One Year.	Traced for less than Six Months.	Length of Time not stated.	
I. With ascites { 1. Acute miliary tuberculosis	1	—	—	—	—	—	—	—
2. Subacute " " { (a) Generalised	6	—	1	1	3	—	1	—
3. Chronic " " { (b) Encysted fluid	16	—	1	3	4	4*	4	—
Total	9	—	—	1	2	2	4	—
II. Fibrous form without ascites { 1. Without adhesions (that is, tubercles over peritoneum undergoing fibroid changes).	0	—	—	—	—	—	—	—
2. Generalised adhesions	5	—	—	3	—	2	—	—
Total	5	—	—	3	—	2	—	—
III. Caseating form { 1. Dry	1	—	—	1	—	—	—	—
2. Suppurating { (a) Generalised	1	—	—	—	—	1	—	—
{ (b) Localised { Multiple	0	—	—	—	—	—	—	—
{ Single	5	1	—	1	2	—	1	—
Total	7	1	—	2	2	1	1	—
Grand Total	44	2	2	10	11	9	10	—
		4		40				

* One of these had recurrence, and was operated on a second time.

TABLE B.—Adults.

	Total.	Died.		Recovered.				Not Improved.
		Of Operation.	Later.	Traced for One Year and Upwards.	Traced for Six Months to One Year.	Traced for less than Six Months.	Length of Time not stated.	
I. With ascites { 1. Acute miliary tuberculosis	1	—	1	—	—	—	—	—
2. Subacute " " { (a) Generalised	12	1	5	1	3	1	1	—
3. Chronic " " { (b) Encysted fluid	48	1	13	12*	9	6	5	—
Total	56	—	7	19	7	9	10	2†
II. Fibrous form without ascites { 1. Without adhesions (that is, tubercles over peritoneum undergoing fibroid changes).	1	—	—	1	—	—	—	—
2. Generalised adhesions	19	—	5	4	1	4	4	1‡
Total	20	—	5	5	1	4	4	1
III. Caseating form { 1. Dry	3	—	3	—	—	—	—	—
2. Suppurating { (a) Generalised	5	—	2	3	—	—	—	—
{ (b) Localised { Multiple	1	—	1	—	—	—	—	—
{ Single	5	1	1	1	—	1	1	—
Total	14	1	7	4	—	1	1	—
Grand Total	151	3	38	41	20	21	21	7
		41		103				

* Three after operation for recurrences. † All recurred. ‡ Recurred after one year.

a sufficiently long time. Further, he gives 17 cases of tuberculous salpingitis with tuberculosis limited to the pelvis; of these 4 died and 13 recovered, 3 being well for over a year. There were about 24 cases of tuberculous salpingitis with generalised tuberculosis; of these 10 died, 3 improved, 1 recurred, and 10 recovered, 3 of these being observed for over a year. Lastly, there were 70 cases which, on account of absence of details, could not be classified, and of these 15 died, 6 improved, and 49 recovered; 16 of the latter have been traced from one to fifteen years.

I may also refer to Roersch's statistics, which are larger, and which have been worked out in the same way as Aldibert's (quoted from Voigt). In the ascitic form in children there were 40 cases with 5 deaths, 35 recoveries, 7 of these being spoken of as definite—that is to say, observed for a considerable time (whether long enough I cannot say). In adults

there were 146 cases, with 32 deaths and 99 recoveries (18 of these being definite). In the fibro-adhesive form in children there were 6 cases, with 1 death and 5 recoveries (3 definite): in adults there were 24 cases, with 6 deaths 17 recoveries (3 definite). In the caseating form there were 22 cases, with 9 deaths and 13 recoveries, 3 of these being definite.

If we study these figures the results come out very much as one would expect from one's own experience. In the first place I do not think that we can draw any definite contra-indication to operation from them. All, even the gravest forms, show some good result and there is no form in which we can say that laparotomy is absolutely useless. Most certainly we cannot go the length to which some go in saying that unless in cases with ascites there is no use in performing laparotomy. On the contrary, as is evident from Aldibert's statistics, the percentage of recovery in ascitic cases (76 per cent.) is not

very much greater than in the dry forms (70 per cent.), and even in the caseating cases a percentage of recovery of 46 per cent. is shown. In my own experience I have had success in the dry form as well as in the ascitic, though, of course, one meets with many more cases of the latter. The statistics rather help us to give a prognosis as to the probability of recovery than enable us to state that laparotomy must not be performed in a given case. The immediate mortality of the disease, which in some of these statistics seems pretty high, will no doubt be less as time goes on. Septic peritonitis, for example, ought not to occur nowadays unless the intestine is ruptured and deaths from shock ought not to be frequent. In the first place cases should not be left until they are practically moribund before the surgeon is called in, nor in any case ought the operation to be so extensive as to lead to any material shock, more especially no attempts should be made in bad cases to remove any portion of the diseased tissue. Most of the deaths after operation are from intercurrent disease, or phthisis, and very frequently there is a temporary improvement before death takes place. These deaths would likewise have resulted without operation, and we can only say with regard to them that the patient has had the chance, but without success.

Prognosis of Laparotomy.

The prognosis of laparotomy naturally varies in different cases. The most favourable are certainly those belonging to the first group, with localised ascites, and the next most favourable are those where the fluid is diffused over the abdomen. I must confess that I have been surprised at the recovery in some of these cases. On opening the abdomen one finds tubercles everywhere, the intestines protrude from the wound, and are seen to be red, inflamed, and covered with tubercles, some of them sometimes of considerable size, the abdominal cavity feels like a bag of rice, and yet in these cases recovery may follow. In two instances in which I gave a very bad prognosis after the operation, on account of the size and number of the tubercles scattered all over the intestine and abdominal cavity, recovery took place rapidly and apparently completely. The next most favourable are the cases where there is no ascites and where we have the fibro-adhesive form to a moderate extent as described under heading No. II. Indeed favourable results have been obtained in this form even where the adhesions were so great that the operator never penetrated into the abdominal cavity. By some this fibro-adhesive form is looked on as a healing process, and it is held that the operation probably merely gives it a fillip in a good many cases. Where the abdomen contains large caseating masses the prognosis is much more grave, and as is evident from the results mentioned above the successes are not nearly so great. At the same time they do occur, and I have myself had a successful result even where there were large masses of caseating material. In this group however it is rather the case of giving the patient a chance than of any great probability of curing him. It must also be borne in mind that it is in these cases more especially that harm may be done by the operation, for unless great care be taken the intestine may be very readily torn and a faecal fistula be established. Indeed in some instances, even where there is no apparent injury to the intestines, a faecal fistula may result after the operation. In these cases also it is not uncommon to find that the scar breaks down subsequently, having become infected with tubercle, but even in spite of this healing may ultimately occur in time where a faecal fistula has also formed, provided always that it is not large nor situated high up in the small intestine.

Cases with slight phthisis also frequently improve both locally and also as regards the lung after operation, but where the phthisis is extensive the result is not good. Opinions differ as regards the effect of pleuritic effusion on the results of operation, but as a whole it is not looked on as a contra-indication. Cases with intestinal ulceration are particularly unfavourable, and it is a question there whether laparotomy does any good at all. Spæth also asserts that cases secondary to tubal disease are not benefited by laparotomy, even although the tubes are removed, but this is contrary to the experience of Aldibert and of a number of other observers who have obtained good results even where the tubes were not touched. The great risk of tuberculous peritonitis in these cases of tuberculous salpingitis, however, makes it essential

that where a diagnosis of tuberculous salpingitis is made the tubes should be removed at once.

Time for Operation.

From the evidence, I should say that in practically all cases where improvement does not follow under medicinal treatment after a reasonable time, say in from four to six weeks in acute cases, to four to six months in chronic cases, the abdomen should be opened whether there be ascitic fluid or not. The operation may do good in cases where it is least expected to do so, and it is but seldom that it does any harm. Do not in any case allow the patient to go down hill too much, otherwise one cannot expect good results to follow, and it is fair neither to the patient nor to the surgeon. It seems to me a very questionable thing whether it is good for the patient that the ascitic fluid should be absorbed seeing that it contains toxins and bacilli, and therefore, as I have said, where improvement does not follow soon I believe that early laparotomy is best, and the medical treatment can follow the operation just as well, or better, than if it precede it.

On the other hand, it apparently does not do to operate too soon. Where one operates quite in the early stage, recurrence curiously enough is very apt to take place, and the explanation of this I believe to be that which I shall give presently in connection with the *modus operandi* of the operation. However it may be explained, it certainly is the fact that most of the cases where repeated operations for recurrence have taken place have been those in which the first operation was performed quite at the commencement of the disease. On the other hand, it is most important not to wait till the patient has gone too far downhill. If the patient suffers pain from bands, or from kinking of the intestine, or from obstruction, operation is necessary, even although much good may not result.

The Operation.

In operating, as has been before stated, it is well not to carry the procedure to the extent of attempting to remove any of the diseased tissues, such as excision of an ulcer of the intestine, the removal of tubes, etc.; unless, indeed, one finds only quite a commencing peritonitis at that part. The removal of the tubes, for example, in cases of advanced peritonitis would mean a prolonged and very different operation, owing to the adhesions, in a peritoneal cavity already very much inflamed, and one which would almost certainly precipitate the patient's death from shock. On the other hand, if on opening the abdomen one finds only slight commencing peritonitis around the tubes, then I believe they ought to be removed so as to prevent further infection. Similarly, in the case of the appendix or cæcum, while a few cases have improved as the result simply of opening the abdomen, the best results have been obtained in cases where the disease has been localised to that region, and where the appendix or the cæcum itself has been resected. On the other hand, in cases with intestinal fistula, operation is out of the question. The patient cannot stand a proper operation for resection of the fistulous portion, and the intestine in the neighbourhood of the fistula is usually so thinned and diseased that any attempt to stitch up the whole without resection practically always fails, and such attempts leave matters worse than they were before. Lastly, it may be said that if one is in doubt it is better to operate than to leave things alone.

Some, thinking that the beneficial effects of laparotomy were simply due to the evacuation of the fluid, have concluded that the same result could be obtained by aspirating the abdomen; this, however, does not seem to be the case; good results have certainly in a few cases followed puncture with evacuation of the fluid and injection of air, but simply tapping the abdomen seems to be quite inefficacious. Further, puncture of the abdomen is a procedure by no means free from danger in these cases. It is not at all uncommon for the intestine to become adherent to the abdomen in the middle line, and cases have occurred where it has been punctured by the trocar, and the death of the patient has resulted. Hence, partly on account of its inefficiency and partly on account of its danger, puncturing the abdomen should be given up as a means of treatment.

The operative procedure is very simple in most cases. Where effusion is present without adhesions, it simply consists in opening the abdomen in the middle line, below the

umbilicus, allowing the fluid to run out, aided by turning the patient on his side and perhaps removing some of it by means of sponges, and then stitching up the wound again. In former days the abdomen was washed out with various antiseptic solutions, such as carbolic acid, sublimate, etc., some leaving the solution in, others flushing out the abdomen afterwards with salt solution. Others again very carefully dried the cavity as far as possible with sponges and so forth. All this seems, however, to be unnecessary, and in reality inadvisable, for as good results are obtained by simple laparotomy without the introduction of any chemical substance at all, or even without flushing out the abdomen or complete removal of the fluid, as where these measures are adopted.

Where adhesions are present, care must be taken in opening the abdomen not to injure the intestine, and if the adhesions are firm it is better to leave them alone and close the wound than to try to force one's way in, unless fluid be present.

In the dry fibrous form, unless the intestine is becoming kinked or bound down by adhesions, it is seldom advisable to try to separate the coils on account of the risk of weakening the wall of the bowel, and consequently leading to a faecal fistula. If, however, obstruction is present it must be relieved or an anastomosis must be made between the coils above and below. Should a rent occur in the peritoneal coat in the course of such an operation it should be very carefully stitched up.

When pus is found it should be washed out by salt solution, and it is then well to introduce a little iodoform and glycerine emulsion into the cavity before closing it.

The question of drainage has been raised in these cases, but there does not appear to be any advantage in drainage where the fluid is serous, and there is the disadvantage that in some cases it has happened that a tuberculous sinus has been left at the seat of the drainage tube. Even where pus is present, unless it be foul-smelling, it seems best to treat it like a chronic abscess elsewhere by washing it out thoroughly, injecting a little iodoform and glycerine, and closing the wound again.

An important point arises—namely, whether a primary focus such as a tube or appendix etc., if found, should be removed. This, as I have already said, depends very much on the extent of the disease. If the whole peritoneum is infected, then no attempt should be made to remove the primary focus, such attempts having generally ended disastrously. On the other hand, if the tuberculous peritonitis be limited to the immediate vicinity of the tube or appendix and caecum, the removal of the primary source is very important, and much better results are obtained by so doing than by simple laparotomy.

As regards the course followed after laparotomy, in some cases immediate improvement begins, while in others ten days or longer may elapse before any noticeable effect is produced. In any case medicinal measures should be superadded to the surgical as soon as possible. In some cases the fluid reaccumulates, and there is then no objection to a subsequent laparotomy; indeed, as has been already said, there are some instances where several laparotomies were performed and where cure was ultimately obtained.

The Rationale of Laparotomy.

[The lecturer then made some remarks with regard to the rationale of the treatment. The results had been attributed to the use of antiseptics, to the introduction of air, to the introduction of light, to the contact with oxygen, to the entrance of non-pathogenic bacteria from the air, to alterations in the circulation as the result of the removal of the exudation, to the removal of toxins, to the setting up of adhesions, etc., but none of these suggestions gave any real explanation. The author made the following suggestion:]

The matter seems to me very much on the same footing as the problem, Why it is that when we open an acute abscess antiseptically we do not have any more suppuration? and it seems to be on the same footing also in this respect, namely, that if we cut down on a commencing suppuration too soon before an abscess has formed we do not necessarily check the suppuration. As I have already said, if we operate too early in tuberculous peritonitis, we apparently do not get the

same good result as if we wait until the disease has become more established. The question in the case of the abscess is as great a mystery as the other. The theory which I have suggested in the case of acute suppuration is that during the course of the disease an antitoxin is being formed in the blood, and that, as the result of opening the abscess, large quantities of serum are poured out and brought thus in contact with the bacteria in the wall of the abscess, and exert an antibacteric effect. On the other hand, if the operation is performed too early, the serum has not had time to acquire a sufficient antibacteric property and further the same amount of serum is not poured out. It is possible that the conditions are somewhat similar in tuberculous peritonitis; where a large quantity of fluid is rapidly removed serum is certain to be poured out to a considerable extent, and this serum may, as I say, be more or less bactericidal. Even in dry peritonitis the irritation of opening the abdomen and separating a number of adhesions leads also to effusion of serum, and it may be that the reason why in dry peritonitis the result is not quite so good as in peritonitis with effusion is that this serum does not act over the whole of the affected area, as it would do if adhesions were absent, or if the whole area were exposed to rapid increase in circulation where a large diffuse collection of fluid has been removed. Further, following on the weakening of the bacilli as the result of this antibacteric serum which is poured out, we have exudation of cells and increased fibrous formation and fibroid changes in and around the tubercles which complete their destruction.

However the matter be explained the truth is that laparotomy in tuberculous peritonitis often leads to a real cure of the disease. This has been definitely proved quite apart from the fact that the symptoms completely disappear, and the patient apparently entirely recovers. In some cases the abdomen has been subsequently opened for some other reason, and it has been found that not only has the tuberculous effusion disappeared, but that even the adhesions and results of the tuberculous peritonitis have also gone. In some cases the abdomen opened a year or two after the operation for tuberculous peritonitis has been found with its peritoneal lining quite smooth and normal. In cases where the abdomen has been opened for a second time during the course of the disease, and where portions have been removed for microscopical examination, it has been found that the mode in which the disappearance is effected is similar to that already known with regard to disappearance of tubercles elsewhere, namely, spindle cells form in the tubercles, possibly to some extent from the epithelioid cells themselves, and the tubercles are gradually converted into fibrous tissues. I had the opportunity in one case of examining the state of matters in a healing tuberculosis of the peritoneum—namely, in a case where I operated for radical cure of hernia, and where, to my surprise, I found that the omentum and the whole of the peritoneum, as far as I could reach, were studded with tubercles. In that case there was no previous history of pain or any other trouble about the abdomen, so that I could not ascertain when this tuberculosis of the peritoneum had set in. I removed portions of the omentum which were present in the hernial sac, and on examining them microscopically found that the tuberculous nodules were for the most part completely converted into fibrous tissue. In some of the nodules, however, I could still detect sufficient remains of the original structure to satisfy me that it had really been a case of tuberculous peritonitis.

[In conclusion the lecturer mentioned that similar results, both as regards arrest of the disease by laparotomy and as regards the changes in the tubercles, had been obtained by experiments on animals, especially on dogs.]

MEDICAL INSPECTORS IN CHICAGO SCHOOLS.—The School Board of Chicago has decided to appoint fifty medical inspectors with special reference to preventing the spread of contagious diseases among children. The inspectors will examine pupils who have been absent from school four days or more, and all those who show symptoms of fever or sore throat. The plan, which is modelled on that already adopted in New York and Boston, will be tried for two months as an experiment.