when examining over 80 cases of congenital dislocation of the hip at the Royal Surgical Aid Society during the years 1909 to 1919, of estimating the shortening in 50 consecutive cases of unilateral dislocation, which had not been subjected to any attempt at reduction; 28 were left-sided and 22 right-sided. The ages of this series ranged from 13 to 67, with a mean age of 26.7 years; and shortening ranged from 1½ inches to 5 inches, with a mean shortening of 2.55 inches. The variations of length in the 18 unilateral cases under review show a range of 1 inch shortening to 1/4 inch lengthening, with a mean shortening of 0.375 inch. The limp is an unmeasurable and variable quantity, and no single clinical examination or cinematograph record is completely trustworthy. A patient may not limp when examined or before the camera, yet with slight fatigue an asymmetry in the walk may show, from weakness in the pelvi-trochanteric muscles, however stable the hip-joint. I have therefore taken the patient's word that he or she limps, although my own observation may not have confirmed this at a short clinical examination. The presence of a slight arrhythmia is compatible with a good functional result. Of the 3 cases which gave bad or poor results, one was bilateral, reduced at the age of 8 in 1912. Subsequent experience shows that this treatment was inapplicable, and should not have been employed. Yet the patient works as a shop assistant, and is on her feet all day. *X*-ray examination shows anterior transposition and concentric reduction, with a flattened head and atrophied neck. Another is a right-sided condition, reduced at the age of 6 in 1914 with a concentric reduction, with active flexion of 30 degrees, abduction 30 degrees, but no rotation at all. She works as a dressmaker, and swims and dances a little. The third is a bilateral case, reduced at the age of 4 in 1913. She works as a milliner, can swim two lengths at the baths, and cycles ten miles. She shows anterior transposition and eccentric nearthrosis. Thirteen cases (17 hips) giving good results have full, free, and painless movements. Six exhibit a slight limp when examined with a loincloth only or after exertion. They show one anterior transposition, four eccentric nearthroses, and twelve concentric reductions, while nine, giving perfect results, are indistinguishable from normal, except in the circumferential measurement of the upper thigh. In five there is one to two inches of atrophy; in two even this difference is absent, each measuring 22 inches in circumference. *X*-ray examination shows two concentric reductions with coxa valga, and eight indistinguishable from normal.

X-Ray Records.

Turning now to the *x*-ray results, I am able to show records of all these hips, taken within the last two months. Of these 25 per cent. are accounted for by three anterior transpositions and five eccentric nearthroses, the remainder (75 per cent.) being sixteen concentric reductions and eight which are normal. In the three transpositions, two occurred in bilateral cases classed bad or poor; one occurred in a unilateral case reduced in 1906, and is a good functional result. In the five eccentric nearthroses four occurred in unilateral cases with good function; one occurred in a unilateral case with poor function. In the sixteen concentric reductions which show abnormalities, the acetabulum may show an increased obliquity or some shallowness: the femoral head may show irregularity in its sphere or flattening; the neck may show valgal or varal bending, anteversion, and stunting. I hold that some of these changes are inevitable, whatever treatment is employed, and are due to the same faulty growth impulse which caused the original malformation—namely, an error of mesoblastic growth. The functional results of the cases shown with shallow acetabula and increased obliquity are so good and the joints so stable that I think that roof formation by an osteoplastic graft is only called for in extreme cases of shallowness and obliquity. Whether the changes in the head and neck are due to an absence of growth impulse, to trauma from reduction, thus allying it to Kümmell's disease, to osteochondritis, to osteo-arthritis juvenalis, or to several of these causes, still remains an open question. Obviously trauma should be avoided and compression prevented during the decalcified stage, the former by reduction at an early age, and the latter by after-care. Froelich,[2] Judet,[3] and Bade[4] agree that a good functional result is consistent with such changes in the bony constituents of the joint. Bade has observed good functional results with eccentric acetabular formation. The normal deep acetabulum and long femoral neck at 130 degrees are provided for athletic, gymnastic, and acrobatic feats; walking, running, dancing, and swimming can be carried out with shallower acetabula and shorter neck, provided the joint is stable and enjoys free and painless motion. The eight joints that are classed as normal are indistinguishable from the hip-joint on the sound side.

CONCLUSION.

My view is that manipulative reduction at the earliest age should be employed. In children under 2 or 2½ the reduction can usually be obtained with the greatest ease whilst gently stretching the adductors. In older children, if an early reduction is not obtained, two further attempts at intervals of seven to ten days should be made, when reduction without force will usually be possible. After three unsuccessful attempts, capsulotomy is indicated in order to deal with the obstruction of soft parts. If, after successful reduction, redislocation occurs from failure of growth of the superior and posterior borders of the acetabulum, the border should be levered over the head and held by a bone graft. The age limit for manipulative reduction is 7 to 8 in unilateral, and 5 to 6 in bilateral, cases. In cases beyond these age limits open reduction is indicated.

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PLEURAL EFFUSIONS IN GENERAL PRACTICE.*

BY

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(*With Special Plate.*)

I HAVE chosen this subject for two main reasons. First, it has been impressed on me that in the examination of cases of chest disease the possibility of effusion is not sufficiently kept in mind and so it is often missed; and secondly, there is even yet a lack of clear teaching as to what should be done when an effusion has been found.

Let me illustrate these assertions by examples taken from two of the great teaching hospitals of London. At an inquest held on a man who had died under an anaesthetic in a London hospital while being operated on for gallstones, the coroner summed up as follows:

> "There was a large amount of fluid in the chest, but it was not discovered. It ought to have been, but it was not. This man has died under an anaesthetic administered for the purpose of an operation for a disease from which he was not suffering. It is a case of mistaken diagnosis."

With regard to treatment, I heard Sir Thomas Horder open a discussion on this subject at Manchester, in which he mentioned that he very seldom saw a pleural effusion in hospital, as his house-physician had aspirated before he had had an opportunity of examining the patient. These selected graduates are apparently under the delusion that the correct treatment for a pleural effusion is to aspirate as completely as possible immediately it is diagnosed. "If they do these things in a green tree, what shall be done in the dry?"

Classification of Effusion.

As is well known, effusion may be a sequel to injury of the chest wall, and the nature and subsequent course of such an effusion, which practically always contains blood, is determined by the character and severity of the injury. These cases are really surgical, and will be excluded from consideration. We need only study two varieties: (*a*) clear; (*b*) thick.

* Substance of a presidential address to the Gloucestershire Branch of the British Medical Association, November 13th, 1930.

Clear Effusions.

The clear effusion is the commonest one with which I deal. There is a simple oedema of the pleural sac, occurring most frequently in heart disease, which may for my purpose be dismissed in a word. It is a transudation of clear fluid of low specific gravity, non-inflammatory in nature, and is associated with oedema elsewhere. It is only part of a general interference with the circulation of tissue fluids, and its importance in the pleural cavity is purely mechanical. It should be removed when it is causing distress, and as often as is necessary, for it shows little tendency to absorption, the cause as a rule being continuous and progressive.

I wish especially to direct attention to the clear effusion often coming on insidiously and without evident cause—the so-called *primary* or *idiopathic effusion*. This is an exudate, with a higher specific gravity and a firmer clot than the transudate of heart disease. (Should doubt exist in any particular instance the pathologist will soon settle the question if 5 c.cm. are submitted to him.) It is the result of an inflammatory process, and the process which causes it is tuberculous. An effusion of this type should never be regarded, as it often is, as an illness in itself, to be considered cured when the fluid has apparently disappeared; it is proof of an underlying lesion demanding long and serious treatment. The many demonstrations, from both the pathological and clinical standpoints, that this effusion is essentially tuberculous, are still unheeded by numbers of practitioners; indeed, there is no lack of active opponents of the idea.

The *Lancet* report of the Manchester discussion on this subject, to which I have already referred, contains the following passage: "Dr. Russell objected strongly to the great interference with working life, and the mental agony inflicted by a tuberculous outlook in these cases. Treatment by ordinary means was quite satisfactory." There are, of course, numerous instances of tuberculous manifestations subsiding under treatment by ordinary means, even in the absence of a correct diagnosis; but who is to be the infallible prophet who will say, in any particular case, that the obvious warning which effusion gives may safely be ignored, and that the patient's "agony of mind" (if that is a reasonable term) is not simply being deferred till it is too late to be alleviated? The pathologists are now coming down very decisively in favour of the "tuberculous outlook" in every one of these cases. Clinicians with large experience are more convinced even than the statistics suggest. Without presuming to rank myself among the clinicians with an exceptional store of experience, I may say that in the county of Gloucester I have seen enough, in the past seventeen years, to enable me to speak with conviction, if not with authority. Scores of times have I seen patients who gave a history of an attack of pleurisy with effusion for which they were kept off work for only a very limited number of weeks, and when I examined them I found active pulmonary tuberculosis with tubercle bacilli in the sputum, and a prognosis varying from "moderate" to "extremely bad." In the hundred beds at Standish House for adult pulmonary cases there were last month twenty-seven patients whose illness had been associated with effusion. A number of those patients had undoubtedly missed, owing to neglected effusions, the most favourable opportunity for treatment, and some tragic after-histories might have been avoided had this sign of tuberculosis received due consideration at the proper time. In my opinion a diagnosis of idiopathic pleural effusion is in fact a diagnosis of pulmonary tuberculosis, in the Ministry of Health classification, and the practitioner ought to recognize it as such, and notify accordingly.

What of the effusions which are not diagnosed? It must not be imagined that these are few and far between. Every year I see large numbers of them. The chief pitfall in diagnosis, when the patient is really examined, is the old and erroneous belief, which still unaccountably persists, that breath sounds are invariably absent over an effusion. All that can be said about breath sounds in this condition (and it is not particularly useful) is that they may be absent, or weak, or altered. The stethoscope, in fact, is frequently more misleading than helpful. There are no physical signs pathognomonic of fluid; they may all be found in other conditions. It is quite a common mistake for a doctor to think he cannot be dealing with an effusion because he hears loud bronchial breathing over the dull area. If, in addition, he discovers whispering pectoriloquy, he then feels confident that there is consolidated lung plus a cavity. Yet exquisitely pure whispering pectoriloquy may be heard over an effusion, and bronchial breathing is about as commonly present as absent. The golden rule is: when in any doubt, put in a needle. This is a procedure which ought to be practically painless if it is properly done. The common faults are: (*a*) the use of a blunt needle; (*b*) the use of a defective syringe; (*c*) absence of local anaesthesia, especially of the pleura; (*d*) want of care in determining a rib interspace; (*e*) the use of too short or too fine a needle. It is truly surprising to see how often a rib is fouled in putting a small needle into the pleura. A frequent source of failure is to locate an interspace with the point of a finger, and then go about an inch wide horizontally, forgetting the angle at which the ribs run, and inevitably hitting bone.

The ideal procedure is somewhat as follows:

The skin is well painted with tincture of iodine or collosol iodine over the dull area, usually just below the angle of the scapula or in the fifth or sixth space in the axillary line. A fine needle is fitted to the syringe, which is filled with sterile 2 per cent. novocain solution. Two fingers are used to define the intercostal space, and between them a bleb is produced by intradermal injection of novocain. A larger needle is then fitted to the syringe and pushed vertically and slowly through the bleb and the insensitive intercostal muscles, the patient being asked to say whenever any sensation is felt; this indicates proximity to the pleura. The remainder of the novocain is then used to infiltrate the pleura, the cavity is entered, the piston is withdrawn, and the syringe fills with fluid. The needle should be sufficiently long to avoid driving it up to the hilt, as that is where needles tend to break, a troublesome complication. If the syringe draws blank, then either the dullness is not due to fluid, or there is pus too thick for the needle. In the latter case, a really stout needle should be passed along the anaesthetized tract (this will be painless), and if pus is present it should be found.

Treatment.

Let us suppose first that a clear exudate has been withdrawn into the syringe. What is to follow in the way of treatment? The patient should be kept in bed until all constitutional symptoms have passed and the morning and evening temperature has been normal for at least a week. A properly kept chart is of the greatest importance. This will mean, on an average, rest in bed for three or four weeks. The fluid itself, if at all possible, should be left severely alone. The only legitimate indication for simple aspiration is distress due to the bulk of fluid, which is, as in the case of the transudate, a purely mechanical consideration. Here, however, we have not a failing heart to contend with. All other indications, all warnings as to remote consequences, should be disregarded. It is surprising how little distress a really large effusion sometimes produces. Fluid right up to the clavicle may not inconvenience the patient to any extent, and, moreover, may spontaneously disappear in three or four weeks. Interference frequently does harm; imagine what happens inside a chest when a large effusion is rapidly withdrawn by a Potain's aspirator, the bottle being kept as near a vacuum as enthusiastic pumping can make it, the fluid discharging with an obscuring froth full bore into the container. We have all participated in such a scene. Meanwhile, a high negative pressure is being induced inside the pleural cavity, followed by a rapid expansion of diseased lung, and a quick change from the lymphatic stasis of collapse to the flooding of the lung tissues with fluid. Apart from the risk of pain, syncope, and even of sudden death, the risk of dissemination of disease of the lung is far from negligible. I will not complicate matters by describing the replacement of fluid by air, a valuable procedure, as this is very rarely done in general practice. Should simple aspiration be resorted to, it is best not to withdraw more than about a pint at a time, and the actual withdrawal should occupy ten minutes. Some people advocate injecting a little of the exudate into the patient's own tissues, a species of autoserotherapy. Considerable benefit has been claimed for it, but I should not recommend it, as the essential precautions are difficult of fulfilment.

The point in treatment which I wish to emphasize above all else is the recognition that primary clear pleural effusion is tuberculous, and that to allow a patient to resume his ordinary work in a few weeks, as is often done, is a dereliction of duty on the part of the practitioner. There is presented to us in this condition an opportunity of treating early pulmonary tuberculosis, and for the usual type of patient sanatorium treatment offers the only hope of carrying out the necessary disciplined life for the requisite length of time. Objection will almost certainly be raised to this course, and unless the position is rationally explained to the patient his co-operation can hardly be expected. If a patient cannot or will not enter a sanatorium, then a careful routine should be laid down for him for a period of three to six months after his effusion. His normal activities should not be resumed within the period.

THICK EFFUSIONS.

Pathological curiosities such as chylous fluids will not be considered. Only two varieties of thick effusion need be mentioned: (*a*) the haemorrhagic, and (*b*) the purulent.

The Haemorrhagic Effusion.

The haemorrhagic effusion does not require much comment. It is said to point to the presence of new growth, but blood is not infrequent in tuberculous effusion. The diagnosis cannot be made from the effusion alone; it must be established by further investigation, which is beyond the scope of this paper. The point to remember is that blood in an effusion has no real diagnostic significance.

The Purulent Effusion.

When pus is found, the diagnosis in one important sense is finally settled. It cannot be too often insisted on that if there is any reason to suspect pus in the pleural cavity, the sole method of diagnosis worth speaking about is the use—and, if necessary, the repeated use—of the exploring needle. All clinical criteria, all other methods of diagnosis, including *x* rays, however useful they may be, are in comparison merely guesswork. As a rule, when a practitioner finds pus in a chest the first person he thinks of is the surgeon. He is quite wrong. It ought to be the pathologist. The immediate and overriding requirement is to establish the identity of the organism responsible for the pus, as everything in treatment depends upon this. A list of pyogenic organisms which may be found can be seen in any textbook. The list is long, exhaustive, and confusing. Amid this welter of possibilities the general practitioner has to think only of three which are of essential significance—namely, the pneumococcus, the streptococcus, and the tubercle bacillus. The first two are found in acute conditions, often with life actually in the balance, when a wrong move may turn the scale. Clarity of mind and of knowledge is here of the first importance. Should a pathologist not be available (and there must be few cases where he is not) then the differentiation between these two has to be made on clinical grounds.

Taking first the pneumococcal group; if, in a case of lobar pneumonia the crisis has occurred but the pulse rate continues high, suspicion should immediately be aroused as to the development of an empyema. The physical signs may suggest that the pneumonia has not resolved, but in the presence of a high pulse rate after the crisis the exploring needle should be used as a matter of routine. When pus is found it is of a thick, creamy consistence.

Very different are the conditions in a streptococcal broncho-pneumonia. Here there is commonly an exudate in the first week of the pneumonic process. This exudate is abundant, and is free in the pleural cavity; there are no adhesions. The exploring needle withdraws thin, cloudy pus, not in the least like the "laudable pus" of a pneumococcal case. The two types require treatment which is radically different, although immediate operation is sometimes the only treatment considered. Osler wrote in his textbook: "It is sad to think of the number of lives which are sacrificed annually by the failure to recognize that empyema should be treated as an ordinary abscess, by free incision." Doubtless this lament was justified at the time it was written, applying, as it presumably did, to pneumococcal cases. But, unfortunately, the advice to treat empyema as an ordinary abscess by free incision has been applied indiscriminately to all types of cases. Pus in the chest is obviously quite different from an ordinary abscess. Immediate operation, whenever pus was found, was the rule in the American training camps during the war. In one camp, out of eighty-five consecutive cases, the mortality was 84 per cent. The average mortality was 48 per cent.—this in young men. These were streptococcal cases. Owing to the work of the American Empyema Commission, which assumed responsibility for treatment in three camps, the mortality rate fell to 4 per cent. And the essential change they introduced was staying the hand of the surgeon. As they themselves point out, the chief danger to be feared in streptococcal cases is premature and meddlesome surgery. The modern point of view was admirably stated by Tudor Edwards, opening a discussion at the Medical Society of London two years ago. He said: "It should be recognized at the outset that the treatment of empyema should never be regarded as an emergency requiring immediate operative intervention." To paraphrase Osler's phrase, it is sad to think of the number of lives which are sacrificed annually because this lesson is not fully appreciated. The critical question in connexion with operation is, Has the pneumonia subsided? Till this can be answered in the affirmative, open operation should be deferred. The pneumococcal empyema, with its creamy yellow pus, found about four weeks after the onset of the illness, should be handed over to the surgeon at once for adequate drainage, which usually means resection of a rib under a local anaesthetic. The streptococcal cases must on no account be operated on at once, or the chances of recovery are immediately reduced. The pus must be aspirated as required to reduce pressure, over a period of about three weeks, until it becomes frankly purulent and adhesions have formed. By that time the pneumonia has subsided, and the case is ready for the surgeon.

A few months ago I was asked to see a schoolboy of 10, where the anomalous physical signs had raised the suspicion of acute tuberculosis. The boy was gravely ill with a streptococcal pneumonia, and repeated aspiration was carried out till the fourth week, when a rib was resected, and all went well. Had this been done whenever pus was found, I have no hesitation in saying that the boy would have died. Sometimes the pus is absorbed completely, if by accident or design it is not removed. Last year I saw a case which I am convinced belonged to this small group. The patient was a boy, aged 6, whose father had died from tuberculosis. He had been examined several times, as he looked thin and white, but nothing had been found except a few small cervical glands, which were of no special moment. In May, 1929, this boy was stricken with an acute illness diagnosed as broncho-pneumonia, and was removed to the local hospital. For three days his temperature was over 104° F. It then came down somewhat, but there was no sign of the pulmonary condition clearing up, and on the thirteenth day of the illness an *x*-ray film was taken, which showed an almost uniform opacity over the left lung. (Plate, Fig. 1.) I heard of all this from the boy's doctor about a month after the illness began. He kindly sent me notes of the clinical condition, and also the *x*-ray film. His notes read: "Temperature now swinging to 101° F. at night, normal in the morning; night sweats; dullness up to spine of scapula on left side; bronchial breathing with some crepitations over same area." He added that, in view of the family history and physical signs, he felt sure the condition was tuberculous. I replied that the film did not suggest acute tuberculosis of the lung, and advised putting in a needle. I saw the boy some time afterwards. In the interval a second *x*-ray film had been taken which opened a "fluid level" in his left chest. When I saw him his evening temperature was 103° F. He looked very white and ill. There was still dullness on the left side, from the base to the spine of the scapula, with patches of loud bronchial breathing and numerous coarse crepitations in the upper third of the left lung. I was told that the chest had been explored three times, with a negative result. Being naturally loath to add anything, however trivial, to the distress of a child already somewhat exhausted by the examination, but, it must be confessed, rather against my better judgement, I accepted this as excluding the possibility of pus, and, as the only reasonable

alternative, committed myself to a diagnosis of acute tubercle, with a hopeless prognosis. In spite of this the child persisted in slowly recovering, and a month ago the last *x*-ray film showed that everything had cleared up, except for some thickened pleura in the middle of the left lung. (Plate, Fig. 2.) The patient is looking well, and there are no physical signs in the chest.

Cases of missed empyema are, I believe, not so rare as we might expect. As in the case just related, the long-drawn-out nature of the illness, the loss of weight, the pallor, and profuse sweating, may lead to an erroneous diagnosis of tubercle. I see them occasionally.

Recently I examined a boy of 12 who had been ill many weeks with these symptoms. There was dullness and bronchial breathing over most of one lung. I put in a needle and found pus, which was up to the second rib. This boy was operated on next day, and did very well.

I was once asked to see a young man, said to be dying of tuberculosis, as it was thought a second opinion might be a comfort to the relatives. I was told of the long illness, the wasting, the drenching night sweats, and the physical signs, which put the diagnosis beyond all doubt. He was not expected to live for more than twenty-four hours. When I visited him I was surprised to see him lying so quietly, as distressing dyspnoea had been described to me as a marked symptom. I then learned that during the previous night the shortness of breath had become extreme, leading to partial unconsciousness and such violent struggling that it took three men to hold the patient in bed. In the throes of this struggle suddenly there was a report audible to all in the room; the patient's chest had burst, and pints of pus were ejected as from a hose, with immediate relief. Certainly I saw the wall splashed by pus 4 feet from the floor at a distance of 6 feet from the bed. There was a circular opening, about the size of a shilling, in the third right interspace in front, leading to the pleural cavity. The subsequent operation was entirely successful.

The remaining group of cases, that involving the tubercle bacillus, is not one with which, as a rule, the general practitioner has much to do, unless he has a patient for whom some optimistic surgeon has resected a rib. As the sinus will discharge for the rest of the patient's life, he will see quite plenty of it.

CONCLUSIONS.

1. Do not be misled by physical signs.
2. In cases of *any* doubt use the exploring needle.
3. Remember that primary clear effusion is tuberculous.
4. When pus is found, open operation should not be countenanced till the lung process has subsided. This means, in pneumococcal cases, after the crisis; in streptococcal cases, three weeks or more from the onset of the illness; and in tuberculous cases, never.

TREATMENT OF LYMPHATIC GLANDS IN CARCINOMA OF THE CERVIX UTERI.*

BY

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IN the majority of cases of malignant disease the problem of the surgeon is how to treat metastases, and it is as well to consider why these distant growths should be so much more difficult to deal with than the original tumour.

The destruction of the original tumour by means of excision or cautery dates back thousands of years; all the advance made on the surgical side has been concerned with a better treatment of metastases. When it was realized that carcinoma tended to spread by lymphatic drainage, operations were devised to remove all the lymphatic glands and vessels which drained that area. This increased the severity of the operation very considerably, and the high primary mortality in many cases, such as Wertheim's operation, was due to the greater shock, the risk of haemorrhage, and the increased possibility of sepsis in such a large area of disturbed tissue.

When radiotherapy first came into use, and it was found possible to heal the primary growth, it appeared likely that the lymphatic areas would be dealt with far more satisfactorily than by excision. Unfortunately, this has not so far proved to be the case, and the reason is by no means clear.

The most likely cause appeared to be insufficient irradiation. In many cases the glands are situated further from the surface, and they are therefore undoubtedly more difficult to irradiate with adequate intensity, but it is equally true that in other cases—for example, the lymphatics of the neck—the glands are, comparatively speaking, superficial, and no such difficulty exists. Accumulating experience would seem to indicate that the metastases are more radio-resistant than the primary growth.

In a bacterial infection we know that the glands do much in preventing the spread of the disease. The organisms have to pass through a cordon of glands before getting to the rest of the body, and, as a rule, those glands deal with the invaders very successfully. The idea that the glands act in the same way in malignant disease is at first sight a tempting one, but is it not possible that the glands in the case of neoplasm act in the very opposite manner—namely, by forming a centre in which the malignant cells can grow more readily? If the malignant cells which wander from the original tumour had the same opportunity of growth as in the glands, should we not find large masses in the tissues all the way along to the glands? If microscopic sections are taken of the area between the original tumour and the lymphatic gland, the lymphatic vessels will very often be found to be completely blocked by cells, but it is not until the glands are reached that large masses of cancer are found. It seems obvious, therefore, that the cells which are waylaid on their journey from the tumour do not have the same power of division and growth as those at a distance—namely, in the lymphatic glands. This can only mean that either the body has a resistance to the neoplastic cells in the intervening space, or that there are factors in the glands which actually encourage growth. The latter hypothesis is suggested at least by the fact that a tonsillar extract has a definite growth-promoting substance for tissue culture, and that tonsillar growths are very radio-resistant.

So far we have considered only the question of cell growth. There is, however, another aspect of the case that must be considered—whether the cells in these special positions are more radio-resistant. Here we are faced with the problem whether the action of radiotherapy is a direct or an indirect one. If we think of radio-action as being purely direct, then it is only possible to think of the individual cell as being more resistant. There is, however, a growing suspicion that the disappearance of growth in the body is not mainly direct action, but to a very large extent indirect action through the changes brought about in the surrounding cells. If this is true, then it may well be that the changes in the glandular tissue are far less than those in the other tissues of the body, and therefore the action on the malignant cell is less intense.

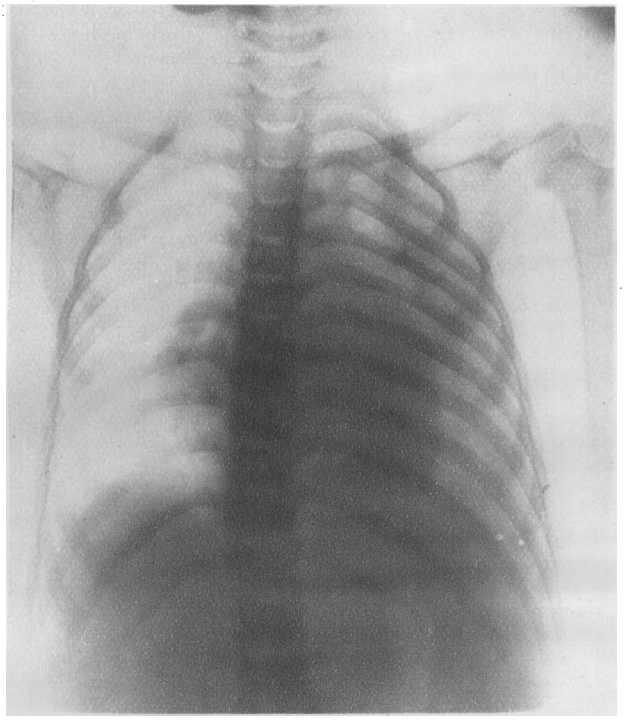
It is not difficult to suggest experiments that might help to throw light on this subject—for instance, the direct implantation of tumours into glands before and after irradiation. It has, of course, been shown by Murphy and others that implanted tumours do not take so well in an area that has been previously irradiated, but I know of no experiments in which a comparison has been made between the effects of inoculating an irradiated gland and of inoculating a gland with an irradiated tumour, the dose of irradiation being the same in both cases. The mere fact that a previously irradiated area prevents an inoculated tumour from taking may prove to be of great significance in early cases of malignant disease. It will perhaps be found that, by a prophylactic irradiation of the glands, cells will be unable to settle down and grow as effectively as they otherwise might.

It is perhaps presumptuous for a mere clinician to try to discuss these biological problems of radio-sensitivity; the most we can do is to try out various techniques by which the infected lymphatic areas can be better irradiated, and experiment with various doses.

One of the earliest types of malignant disease to be successfully treated by irradiation was carcinoma of the cervix uteri. In early days the treatment was somewhat crude, but in spite of this fact good results were obtained locally. At the present time there are several different

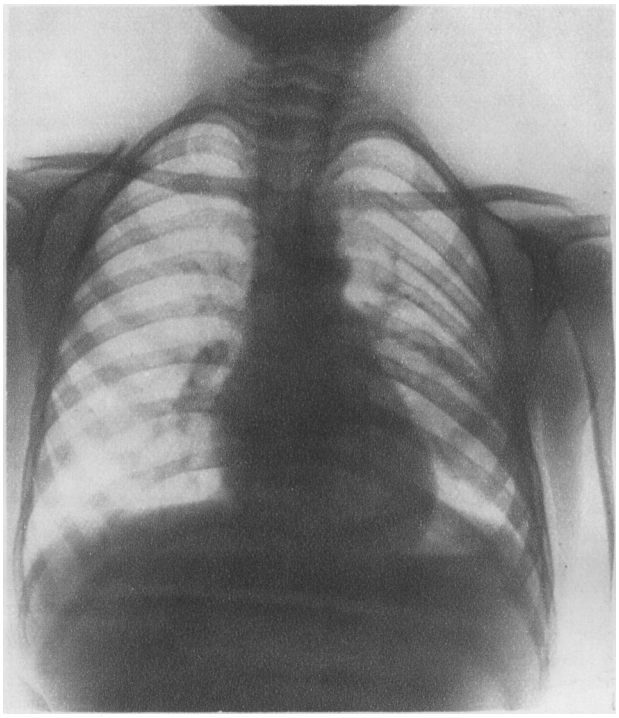
* Read in opening a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Winnipeg, 1930.

W. ARNOTT DICKSON: PLEURAL EFFUSIONS IN GENERAL PRACTICE.



Empyema cured by absorption in boy aged 6.

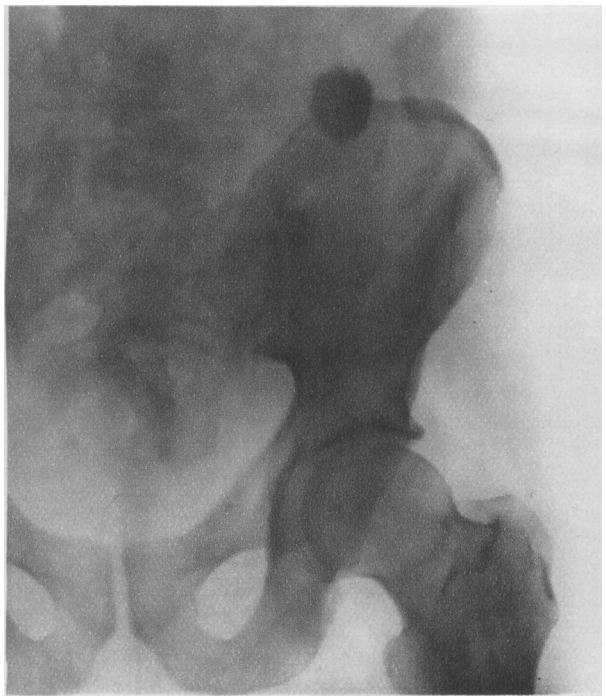
Fig. 1.—May, 1929.



Empyema cured by absorption in boy aged 6.

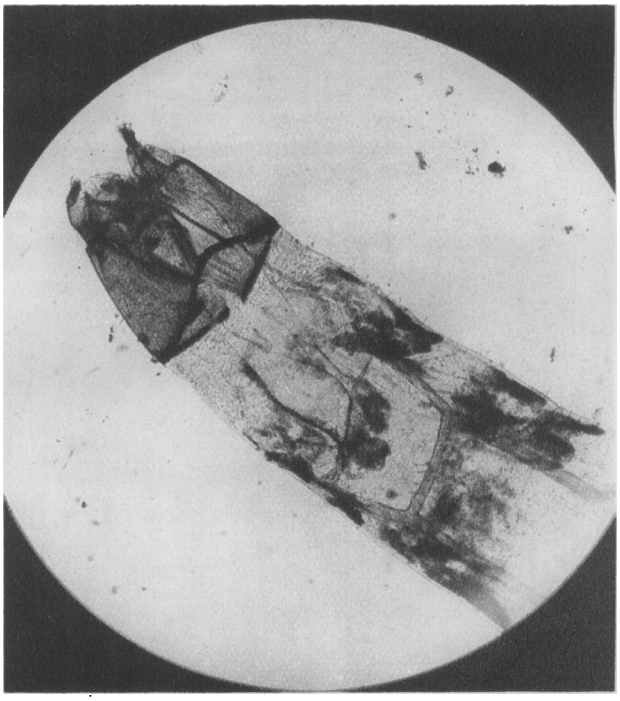
Fig. 2.—After recovery.

C. ALEX WELLS: APPENDIX CONCRETIONS OPAQUE TO X-RAYS.



X-ray photograph, showing shadow of stone at site of the appendix, (from behind).

J. F. D. SHREWSBURY: A CASE OF HUMAN INTESTINAL MYIASIS.



Microphotograph of the head and anterior segments of the larva of Anisopus (Rhyphus) fenestralis, Scopoli (× 40).