lumbar disk protrusions is one which has been called the femoral-nerve-stretch test. A protrusion of the second lumbar disk is related to the third lumbar nerve and one of the third lumbar disk to the fourth lumbar nerve, and while little tension is developed in them by straight-leg raising it has been shown (by dissections) that they rapidly become tense when the hip is hyperextended and the knee flexed. In cases of upper lumbar disk protrusion the movement causes a marked increase in the patient's pain (Fig. 3).

FIG. 3.—The femoral-nerve-stretch test.

In this discussion of operative indications attention has been centred upon cases with lower-limb pain. Most of these patients have low back pain in addition, but cases are also seen in which low back pain is the only symptom, any leg pain having cleared up spontaneously. In the majority of such cases which have been seen it has been felt that an operation to remove a disk protrusion would be unsound, and they have been referred to the orthopaedic surgeon for treatment—including spinal fixation in the more severe cases. In a very few cases in which severe low back pain was associated with attacks of locking, a disk protrusion has been removed with gratifying relief of symptoms.

Conclusion

These observations are based upon the clinical and operative findings in a personal series of over 220 proved cases of lumbar intervertebral disk protrusion treated at St. Bartholomew's Hospital and in an E.M.S. neurosurgical unit during the period Jan., 1938, to May, 1945. Many of the cases have been referred to me by Mr. S. L. Higgs, at whose request I have made this communication and for whose help and encouragement I should like to express my gratitude. Among other colleagues who have referred the patients in this group to me I am particularly in the debt of Mr. L. W. Plewes and Wing Cmdr. J. H. Hunt.

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The Central Council for Health Education will hold one residential summer school in England this year, at Somerville College, Oxford, from Aug. 14 to 28 inclusive. The directors of the school will be Miss D. E. M. Gardner, M.A., head of Child Development Department, University of London Institute of Education, and Dr. Robert Sutherland, medical adviser and secretary to the council. The school is intended primarily for those who have to do with the training and care of children and young people—teachers, youth leaders, health visitors, school nurses, educational and medical administrators, training organizers, welfare superintendents, sanitary inspectors, and students. The object of the school is to present the general content, methods, and applications of health education. Mornings will be devoted to lectures in physiology, psychology, the biology of infection, sociology, and health, as well as to lectures, demonstrations, and discussions on the methods and applications of health education. Evening lectures will deal with wider educational, psychological, social, philosophical, and spiritual aspects. There will be opportunity for discussion under experienced leaders, for viewing health films and acquiring technique in visual aids. The afternoons will be left free for optional visits, sports, and physical recreation under expert leadership. Those wishing to book accommodation or to be supplied with further details about the school should write to the medical adviser and secretary, Central Council for Health Education, Tavistock House, Tavistock Square, W.C.1.

SURGICAL TREATMENT OF DYSENTERIC LESIONS OF THE BOWEL AMONG ALLIED PRISONERS OF WAR IN BURMA AND THAILAND

BY

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Dysentery has levied a tragic toll among prisoners of war engaged in constructing the Thailand-Burma railway. Multiple diseases have been the rule and malnutrition rife. For example, numerous prisoners suffered simultaneously from dysentery, malaria, tropical ulcer, and gross malnutrition. Avitaminosis, particularly that associated with the B₂/B₆ complex, has been common. Some of the special problems in the treatment of dysentery have been:

(i) The appalling severity of the lesions, in many cases demonstrated to have *Entamoeba histolytica* infection.

(ii) The ever-embarrassing shortage, and in many cases the complete absence, of specific amoebicidal drugs.—For example, in working camps providing the most wretched conditions of life, at times not even magnesium sulphate could be obtained, and recourse was had to such pathetic devices as the administration of charcoal manufactured locally. Emetine, when available, was often obtained only sporadically, in clandestine ways, and had to be used with the utmost economy, with a view not to cure but to prolong life.

(iii) Facilities for microscopy were very frequently not available as a diagnostic aid in the early stages.

(iv) Chronicity of the bowel infection and the establishment of an "emetine-resistant" subject deriving little relief from treatment, or almost immediately relapsing.—This may be due in large part to the extremely low vitality of the individual through the multiplicity of diseases, malnutrition, and complete exhaustion. Many subjects were forced to continue working with established dysentery, and commonly months went by with only the crudest symptomatic treatment being possible, so that the bowel suffered gross damage. When this chronicity was established large quantities of emetine, even to a total of more than 50 gr. (3.25 g.) given over the period of illness, quite failed to provide relief.

Pathology

In practically all those seeking surgical relief *E. histolytica* had been demonstrated in the stools, and in most cases proctoscopy revealed typical amoebic ulceration in the lower bowel. Only one case in the series under discussion was not proved to be amoebic. Undoubtedly in some subjects both amoebic and bacillary infection were present, as reflected by the inclusion in the stools, in addition to *E. histolytica*, of a bacillary type of exudate and macrophage cells. In the acute phase of the disease, with constant passage of blood and mucus—up to 60 motions daily—ulceration was often not the usual limited and circumscribed amoebic lesion, but took on very florid forms associated with devastating lesions of the large bowel, notably a gross cellulitic swelling; and tumour formation occurred, or even huge patches of sloughing gangrene, spreading at times to the peritoneal coat. These florid lesions were chiefly in the caecal region and right half of the colon; spread to the ileum, however, was negligible.

The complication in this type of infection was all too frequently peritonitis, due either to the seeping of infection through the bowel or, less commonly, to actual perforation. In a few cases severe haemorrhage occurred, associated with passage of sloughs.

In the more common cases of prolonged chronic infection with the passage of blood, mucus, and pus over long periods, and gradual exhaustion, it was often noted at operation that inflammation, scarring, and fibrosis were present in the caeco-appendicular area. The caecum and ascending colon were fixed and indurated, with adhesions, and the peritoneal folds and

appendices epiploicae were grossly thickened. A common feature was a tendency to obliteration of the taenia and loss of haustration, the bowel being thickened, congested, and fibrosed, with roughened peritoneum and a brownish-red mottling. In two cases with no previous history of appendicitis the appendix had almost entirely sloughed away (ileostomy series). In general the appendix shared in the pathological process to a greater or lesser extent. In one case a cellulitic condition of the caecum and ascending colon of slow onset was associated with a retrocolic perforation and abscess formation (ileostomy series). Stricture formation after sloughing was met with principally in the rectum, but one patient became obstructed with a similar fibrotic process in the ascending colon near the hepatic flexure, a stricture also being present in the rectum. In two cases with gross fibrotic thickening in chronic colon lesions pathological section revealed *E. histolytica* embedded deeply in the fibrosed coats of the bowel. One interesting case of polyposis of colon and rectum requiring resection was associated with this deep infection.

Clinical Features

For the most part surgical cases fell into two groups: (1) Earlier cases of more acute nature, in which the principal difficulty was to afford relief of pain, tenesmus, wasting, deterioration, and loss of morale owing to lack of specific drugs to control the disease. For this type of case appendicostomy and caecostomy have been most effective and have certainly saved a number of lives. Indeed, the effect of this operation has in many cases been dramatic. (2) Cases of longer standing with a grossly damaged colon which, even when specific amoebicidal drugs have been repeatedly given in quantity, have failed to respond. In some of these cases, of years' duration, the complete rest of the large bowel afforded by ileostomy has been invaluable.

The Case for Surgery

Despite almost insuperable difficulties medical treatment of amoebic cases has been most diligent, and every form of available medication was tried in ingenious ways. In many cases emetine was for periods not available, and when it was it had to be used most sparingly in small courses to give the maximum life-saving effect. Ipecacuanha, emetine, emetine bismuth iodide, yatren, stovarsol, carbarsone, as well as drugs of the sulphapyridine series and sulphaguanidine, were, however, administered in quantities normally curative to many patients who finally required surgical treatment.

Bowel lavage per anum was frequently employed, using various solutions such as saline, silver nitrate, copper sulphate, potassium permanganate, eusol, rivanol, tannic acid, quinine, and yatren when available. The results were most disappointing, and in general experience cast doubts on the feasibility of thoroughly flushing out the large bowel in this way. This was mainly due to the intense irritability of the ulcerated bowel, the patient being unable to retain more than a few fluid ounces before voiding.

The failure of medical treatment and the wretched plight of dysentery patients led to an interest in surgical relief even though surgical measures are given little prominence in standard works. In Thailand this failure led at first to the adoption of appendicostomy and caecostomy, as affording easy means of efficiently washing out the bowel. This measure began to be practised in 1943 independently in various centres such as Kanburi Hospital (MacFarlane and de Soldenhoff), Takanoon (Pemberton), Tarsau and Chungkai Hospitals (Dunlop). The striking relief given to patients who seemed beyond hope caused much gratification.

In the meantime Lieut.-Col. A. E. Coates, A.A.M.C., introduced in Burma the technique of ileostomy, and on his arrival at Nakompton stimulated interest in the hospital clinical society by showing a case in splendid condition after this operation many months previously. This case had been deteriorating hopelessly and had at no time in the course of the disease received any emetine. Lieut.-Col. Coates believed that there would be a small residue of chronic cases for which this measure would be invaluable.

It must be noted that without emetine any surgical attack on the appendix or caecum involves some danger of spread of amoebic infection to the abdominal wall. I had observed this

catastrophe in two patients previously, and was of the opinion that appendicostomy and caecostomy were much more satisfactory if a small quantity of emetine was available to follow the operation.

The freedom of the ileum from infection and the complete diversion of the faecal current by ileostomy presented arresting advantages; the only disadvantage was that a more severe second operation would ultimately be required, and that many patients felt some reluctance to endure prolonged faecal soiling. It was evident, however, that patients could enjoy perfect health without colon function; indeed they could carry on useful work, thus allaying fears that this operation was impracticable under the poor hospital conditions available and that it might upset the slender nutritional balance of those already suffering from gross malnutrition.

Operations performed at Nakompton P.O.W. Hospital in 1944-5

Appendicostomy.—8 cases. One of these was formally closed recently, and one closed spontaneously after the disease process had subsided. The remainder have been left open as an insurance measure, despite the fact that every patient except one has regained good health.

Caecostomy.—1 case.

Ileostomy.—14 cases. Of these only the original case of Lieut.-Col. Coates has as yet been closed by a small-bowel anastomosis.

Excision of Sigmoid Colon after Transverse Colostomy.—One case of amoebic dysentery and gross polyposis of the left half of colon and upper rectum.

Resection of Right Half of Colon and Terminal Ileum and Ileotransversostomy.—One case—that of a fibrous stricturing lesion of the ascending colon. Rectal stricture was also present. Preliminary ileostomy was performed to relieve intestinal obstruction.

Excision of Rectal Stricture and Anastomosis.—One case of complete stricture of the rectum.

Spinal analgesia was employed in all cases except one in which a local infiltration was used.

Deaths

There were three deaths among ileostomy patients. Two of these were due to operation being deferred until the patients were in a moribund state, death occurring on the fourth and tenth post-operative days. The other death occurred after the patient had temporarily regained good health, and was due to intercurrent disease. In the case of resection of the right half of the colon death was due to peritonitis and acute dilatation of the stomach. The health of this patient was greatly undermined by an amoebic abscess of the liver and lung and by two serious operations for a lip carcinoma with secondary glands in the neck. In assessing mortality rates it must be remembered that all these patients were considered unlikely to survive without surgical intervention.

Nature of Operation; Complications and Results

Appendicostomy.—In all cases except two the appendix was brought out through a small transverse muscle-splitting incision in the right iliac fossa, the caecum being sutured to the peritoneum. In two cases the appendix was brought out through a small separate stab incision. In all cases the appendix was immediately divided and a tube inserted at operation. It has been clearly shown that if any difficulty is experienced in delivering the appendix there is no objection to dividing the meso-appendix, but it is necessary to leave intact the small arterial branch at the base of the organ. No cases have shown any serious infection; the wounds healed well and none have given any anxiety. One case developed a small ventral hernia after spontaneous closure. This was ultimately repaired and the stump of appendix removed. Six of the eight cases regained good health, five having passed clearance tests of more than six negative stools. Two of these received no emetine post-operatively—only bowel lavage with yatren and copper sulphate solution. One patient who appears to be in perfect health has on one occasion shown *E. histolytica* cysts in stools. Another has merely held his own, as against previous steady deterioration, and still has active infection. One case failed

to make progress, and subsequently underwent ileostomy with excellent results.

Caecostomy.—One patient, though suffering serious chronic infection, did not desire ileostomy. He had had a previous appendicectomy, so caecostomy was performed. The result has been excellent after assiduous bowel lavage. He has passed a clearance test of six stools. He still wears the tube, but without inconvenience. In many cases the complete relief of symptoms has been most dramatic with these simple operations. For example, in some instances the number of motions has fallen immediately from 20–30 a day, the patient never having more than 1 to 2 daily after operation, and blood and mucus have quickly disappeared from the stools, with rapid cessation of pain and distress. This relief is thought to be due to three factors: (i) temporary paralytic ileus of the bowel following operation; (ii) release of wind through a "bung-hole"; (iii) the effect of lavage. This undoubtedly has considerable value, as demonstrated by the relief expressed by many patients and by fluctuation when patients were moved and it was not carried out. In stubborn cases large quantities of fluid have been given by the drip method with good results. The most effective post-operative method has been a course of emetine (usually only 5 gr. (0.32 g.) available), and bowel lavage with preliminary saline followed by yatren solution 2½%. Rivanol solution 1/1000 and CuSO₄ 1/5000 have given good results. Usually not more than 5 yatren wash-outs could be carried out.

Ileostomy.—The site of election for operation has been 18 in. (45 cm.) from the ileo-caecal junction, and in six cases the incision has been a small right rectus-splitting one, with the proximal limb of the bowel at the distal extremity of the wound. In the remaining cases a small muscle-splitting incision as for appendicectomy has been employed, with the proximal limb on the medial side. One interstitial mattress stitch through an avascular point in the mesentery, together with a few sutures of the seromuscular coat of the bowel to the peritoneum, has fixed the bowel satisfactorily. In general, long exploratory incisions have not been used. In three cases a very diseased appendix was removed at operation. On three occasions the bowel was not divided at the original operation, a suture being fixed into the proximal limb through the belly wall. The procedure did not provide as satisfactory drainage as with a clean division of the bowel and for the time being the faecal current was not completely diverted, so now in all cases the bowel is divided and two tubes inserted—one for draining and the other for lavage of the colon. The main complications met with have been minor attacks of obstruction during the first month, associated with hiccup and sometimes vomiting and distension. Approximately half the cases have shown this complication in greater or lesser degree. The high-residue diet of prisoners of war has been found largely responsible, and with a strict diet of low residue it has usually been possible to leave the tube in for 7 days, until the wound has quite healed. The oedema of the exteriorized gut takes about one month to subside, and care is needed in regard to diet during that period. Lavage of the proximal limb of the ileum, together with removal of the tube and dilatation of the stoma, may be required to clear obstruction. Pituitrin has been found useful. Care must be exercised regarding fluid replacement, as in the early stages some 50 fl. oz. (1.4 l.) may drain away daily. Blood transfusions and saline administrations are often necessary in such cases. Saline is easily given by the proximal limb of the bowel as well as by other routes.

A temporary skin irritation often arises during the first few days of wearing an ileostomy bottle. These have been improvised from Dutch water-bottles, Service pattern. No serious case of digestive action on the tissues has occurred, but the application of serum of slaughtered bullocks has been found useful in certain cases. Usually vaseline, zinc cream, or talcum has been effective. The skin rapidly becomes toughened. No serious wound infections have developed. Prolapse of the intestine by intussusception has occurred in two cases—one a rectus-splitting case, the other a small transverse-iliac-fossa incision. This was readily replaced.

The general condition of these patients has been most satisfactory and their gain in weight and vigour most convincing. It is particularly noted that during the first few weeks after

operation the lower ileum to some extent takes over the function of the large bowel and the discharge becomes much thicker and less fluid. Usually blood clears up in a period of from a few days to a month, and in some cases the patients have not had any rectal motion for weeks or months except with an occasional wash-out.

In several cases no emetine could be given post-operatively, yet the patients have made good progress, gaining weight rapidly. Occasional bowel wash-outs—e.g., weekly—are useful in removing debris from the colon, but where these have not been possible some patients have gone weeks and months without any bowel action. Four who have recently been operated on are still not entirely free from rectal motions with blood and mucus; but all have made excellent progress, gaining much weight, and already are altogether brighter and more cheerful. One of these required drainage of a right-sided retroperitoneal pericolic abscess, with only intermittent discharge through the bowel.

Seven cases, representing operations performed a varying number of months ago, have all regained something like normal health and vigour, and most of these patients are quite active, eating a normal diet and doing light work. In the absence of adequate emetine two of these have had a slight relapse with passage of a little blood and mucus per rectum, but this rapidly cleared up with bowel lavage. In the remaining five, rectal lesions were observed to heal in two to three months, and more than six examinations of bowel content revealed no *E. histolytica* infection. The ileostomy bottle usually requires emptying five times in the 24 hours, but patients find life quite tolerable after the previous misery.

Closure of Enterostomy.—This step has been deferred at Nakompton pending x-ray and sigmoidoscopic investigation of the large bowel. Lieut.-Col. A. E. Coates closed the original ileostomy case brought from Burma after two years' rest of the bowel, and this patient is now in excellent health. It was noted that one case arriving at Nakompton had been previously closed by Major T. M. Pemberton, R.A.M.C., after approximately three months' ileostomy drainage. This patient has remained quite well. In general it is felt that the opening in the bowel is an excellent insurance against recurrence of active symptoms, and that the decision regarding closure is best deferred until after evacuation from Thailand.

Summary and Conclusions

Brief particulars are given of a series of cases submitted to operation at Nakompton after failure of medical treatment of amoebic dysentery infection.

The cases were all of exceptionally severe nature, and facilities for treatment were poor.

Most cases had become emetine-resistant.

Appendicostomy and caecostomy have been proved very useful measures for cases with less severe bowel damage, the infection usually being of a few months' standing. These operations have, however, given excellent results in some severe cases of long duration, and even in this type of case well deserve a trial if the patient does not desire ileostomy. More radical operation can always be done if this simple procedure fails. It is desirable but not essential to use emetine in the post-operative phase, and yatren wash-outs have been found most effective.

Ileostomy has given excellent results in the most severe emetine-resistant cases even when emetine has not been available post-operatively. It is the most certain method of arresting the disease.

Experience in Thailand has led us to believe that surgery has a definite place in the treatment of dysentery, and that early consideration should be given to this measure in cases where medical treatment has failed and the patient is continuing to deteriorate.

The results obtained by surgical methods have been due to the close collaboration not only of several surgeons but also of the physicians in charge and the pathological staff, as well as the medical orderlies, who have laboured devotedly in the operating theatre and wards. Special mention is due to the physicians especially concerned with these cases. These are Lieut.-Col. MacFarlane, R.A.M.C., Lieut.-Col. H. Larsen, N.E.I. Medical Services, and Major W. E. Fisher, A.A.M.C., Capt. J. Street, R.A.M.C.; also Major T. Marsden, R.A.M.C., for his ingenious pathological assistance.

Typical Appendicostomy Case Report

British O.R., R.A.S.C.—The onset of dysentery occurred in a Thailand jungle camp in Feb., 1943. Symptoms were very severe—approximately 20 motions daily with much blood. No emetine was

at first available, and he was treated with magnesium sulphate and potassium permanganate bowel wash-outs. Later this patient had the advantage of 32 gr. (2.13 g.) emetine in 6 courses, several courses of ipecacuanha, 2 courses of santalin (30 tablets), and various bowel wash-outs. Sulphaguanidine was also tried, and gave a transient fall in the number of motions. He resisted all treatment, finally receiving practically no benefit from emetine administration. Before operation his condition was wretched; weight 7½ st. (47.6 kg.). He had a wasted appearance, could get no rest because of pain, tenesmus, and very frequent motions, and his appetite had failed. He begged for operative treatment. Abdominal examination revealed diffuse tenderness and thickening of the colon, but no tumour formation. Proctoscopic examination showed very active ulceration of the rectum of amoebic type. Stool tests repeatedly showed *E. histolytica*, red blood cells, and pus cells.

Operation, Aug. 8, 1944.—Spinal procaine 150 mg. Morphine ¼ gr. (16 mg.). A small transverse skin-crease incision was made in the right iliac fossa and the muscles were split. The caecum was thickened, indurated, and bound down to the right iliac fossa by adhesions. The appendix was long, thickened, congested, and indurated, and was found in the ileo-caecal angle. No ulceration of the mucosa was seen. To mobilize the appendix most of the meso-appendix was clamped and tied, leaving the arterial branch at the base; the appendix was then brought out of the wound and the caecum sutured with fine silk through the peritoneum. The peritoneum was closed with catgut, the muscles with catgut, and the skin with silk-worm-gut. Fine transfusion tubing was passed into the appendix to the caecum at a point 1 in. (2.5 cm.) from the abdominal wall, to which the tube was then anchored with a stitch. Dressings of soft paraffin and tinct. benzoini co. were applied.

On the first post-operative day yatren wash-outs, 2½%, preceded by saline 1 pint (568 c.cm.); five daily wash-outs with yatren solution were given, followed for a time with copper sulphate 1/5000 daily. Emetine was available on the fourth post-operative day, and 5 gr. (0.32 g.) was followed by a course of emetine bismuth iodide 15 gr. (1 g.). The wound healed by first intention, sutures being removed on the seventh day. The stoma was excellent, with a mucocutaneous junction. There was no untoward reaction.

Progress.—By the fourth post-operative day the patient had one motion daily, firm and almost clear of blood. Appetite improved right from the start and the pain disappeared. In four months he had put on over 3 st. (19 kg.) in weight. Proctoscopy in Feb., 1945, revealed a healed rectal mucosa. Now, after twelve months, he is perfectly healthy, and has had no relapse; he has gained nearly 4 st. (25.4 kg.) in weight and works as a voluntary orderly. All stool tests have been negative—the last a series of six done in Aug., 1945. The appendicostomy stoma causes no particular inconvenience.

STREPTOCOCCAL MILIARY INFILTRATION OF THE LUNGS

WITH DESCRIPTION OF A CASE

BY

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The existence of an infiltration of lung tissue, giving rise to radiological shadows almost identical with those of pulmonary tuberculosis but not apparently connected with the tubercle bacillus, is well known (Scadding, 1937, and others). In a consideration of the aetiology of subacute pulmonary infections (Davidson and Ellman, 1941) attention was drawn to the fact that many pulmonary lesions are now brought to light which, before the days of adequate x-ray examination, passed undetected, and, while in most of these the nature of the disease is not in doubt, in many the differential diagnosis is still a matter of considerable difficulty. In other words, radiological diagnosis, no less than physical diagnosis, has its limitations; nor does it always provide a short cut to that understanding of the morbid anatomy of disease which can be reached only by a synthesis of all the available data.

Since the publication of the above-mentioned paper I have encountered a number of acute and subacute non-tuberculous pulmonary infections closely simulating, in their clinical and radiological appearances, pulmonary tuberculosis, but showing signs of healing by natural resolution within a relatively short period. In some such cases the streptococcus has undoubtedly been a causal organism. A case of an apparent acute streptococcal miliary infiltration of the lungs is now described.

History of Case

Miss A., aged 20, was admitted, almost moribund, as a case of acute leukaemia to Leatherhead Emergency Hospital on Aug. 5, 1945. She presented a picture of gross anaemia and a virulent infection. She gave a history of increasing fatigue, weakness, and pallor over the past two to three months. Her periods, previously irregular but normal, had during that time been scanty. Immediately before admission, in addition to aggravation of these symptoms, she had noticed acute dyspnoea on exertion, attacks of giddiness and palpitation, and a slight cough on the morning of admission. There was no history of any obvious loss of weight. During the spring of 1945 a slight pyrexial attack was accompanied by a sore throat and a cough with a little yellowish sputum. She also had a slight haemoptysis, after which the sputum was blood-stained. This attack lasted two weeks, and was followed by a similar attack, but without the haemoptysis, a few months later. There was otherwise no noteworthy previous history. The family history was likewise negative, and her occupation was of no significance so far as her illness was concerned. Seven weeks before the onset of this illness she had attended a mass radiography clinic, when her lung fields were reported as clear.

On admission she was grossly anaemic, too weak to cough, and very "bubbly"; her respirations were shallow and rapid (36); the

FIG. 1.—Skiagram of chest from a case of acute streptococcal miliary infiltration of the lungs.

pulse was thin, rapid (120), and irregular; temperature 101°. Examination of the lungs showed scattered crepitations throughout both lung fields and broncho-vesicular breath sounds. The heart was not enlarged clinically; the rhythm was regular; the heart sounds were very faint; there were no significant murmurs; the blood pressure was 130/60. There was no lymphadenopathy or splenomegaly. Examination of the fundi showed them to be normal, but a large haemorrhage was seen in the right retina. A blood count showed a haemoglobin of 23%; the white cells numbered 26,000, mainly polymorphonuclear in type; otherwise there was nothing significant in the differential count. X-ray examination of the chest showed diffuse miliary infiltration of all zones of both lungs, but the apices were singularly clear (Fig. 1).

The next day her pulse was more regular and the respirations not quite so shallow. The physical signs in the chest were unchanged, and the temperature was still 101°. Following half a pint (284 c.cm.) of blood, given very slowly, her haemoglobin rose to 30%; the white cells numbered 23,000 (polymorphs 90%). She was given large doses of iron and ascorbic acid, and ¾ pint (426 c.cm.) of concentrated blood again that night. On Aug. 7 the physical signs in her chest were