connected with the state of allergy, but what we may describe as the normal eczematous reactions are essentially related to physical conditions in the external environment. These cases—and they make up the vast majority of eczematous patients—are sensitized to friction owing to a defect in the physical conditions of the rete and cuticle with inherited or acquired increased permeability of the capillary walls. Such cases can be cured by simply raising the pressure of the rete and cuticle over the capillaries.

Exact knowledge is needed, and when this comes we shall be better placed for classifying the protein sensitization diseases. I am not yet prepared to say what value is to be attached to local signs of cell irritability provoked by the intra-epidermic applications of various proteins. There are many conditions which affect cell irritability besides protein sensitization, and for myself I prefer to wait for further evidence.

BILE SALT AS A VEHICLE FOR A PEDICULICIDE.

BY

B. A. PETERS, M.D., B.Ch., D.P.H.Cantab.,

SENIOR MEDICAL OFFICER, HAM GREEN HOSPITAL AND SANATORIUM, BRISTOL; LECTURER IN FEVERS, UNIVERSITY OF BRISTOL.

For several years we have been experimenting with various substances for the destruction of head lice, but nothing was found which prevented the hatching out of the nits. It was considered that as bile salts are stated to assist the passage of emulsions of fats through the mucous membranes by their property of reducing surface tension, they might have the same effect in assisting oily emulsions to penetrate the shell of the louse's egg. Experiments were made with various strengths of sodium taurocholate in watery solution with eucalyptus and sassafras oils. The best compound was found to be

Sodium taurocholate		10 grams.
Ol. eucalypti		50 c.cm.
Water	to	1,000 c.cm.

Dissolve the bile salt completely in water, add the eucalyptus oil, and shake well.

A higher concentration of bile salt rendered the hair very sticky, whilst a lower did not form so good an emulsion. More than 5 per cent. eucalyptus rapidly separated out. The formula yields an emulsion like milk in appearance, and but little of the oil separates out after several days.

Most lice, if immersed in the liquid, cease movements in a few seconds, but a few individuals did not die for three minutes. In no case did any of those tested recover when dried on blotting paper and incubated. Larger insects, such as wasps, house-flies, and fleas, when dropped in the emulsion became wetted all over immediately, and died in less than a minute.

During the past eighteen months the emulsion has been tried on over 500 patients on whose heads living lice were seen. It is well rubbed into the head until all the hair is wetted. The head is then wrapped in a bathing cap or towel and the application left on all night. The head is washed with soap and water next morning, and a fine-toothed comb used daily for a fortnight, notes being kept of any lice found. In 23 per cent. of the cases no lice were found after one application. In the remainder a few recently hatched very small forms were discovered, in no case before four days after the first application, in most cases not until after a week, and in a few not until the tenth day. A second application on this reappearance sterilized 63 per cent., while 14 per cent. required a third application.

It appeared that the embryos on the point of emergence were killed, whilst the most recently deposited eggs were more resistant.

Some of the worst infested heads, in which the towel swathing the head was nearly black with dead lice on the morning after the first application, were sterilized with one application, while some of the lightly infected required three applications, so that it would seem that there must be different powers of resistance in certain strains of lice.

This preparation is not toxic, is not irritating to the skin, is not inflammable, and is elegant to use as it is easily washed out of the hair. The cost of the ingredients works out at 6½d. a pint.

Possibly the property of bile salt solutions to wet the lice and their eggs can be combined with some substance more poisonous than eucalyptus oil to the louse's egg, so that one application would always be sufficient.

The Lettsomian Lectures

ON

AMOEBIC LIVER ABSCESS.*

DELIVERED BEFORE THE MEDICAL SOCIETY OF LONDON

BY

SIR LEONARD ROGERS, C.I.E., M.D., F.R.S.

[*Abstract.*]

LECTURE II.—VARIETIES AND TREATMENT.

The lecturer continued his remarks on pathology by referring to suppurative cholangitis, a rare disease in which he had been greatly interested ever since he met with three cases at St. Mary's Hospital in his third year studentship. Fourteen years later he recorded a case which he had diagnosed and operated on at Calcutta European General Hospital, in which a mass of gall stones was removed from the hepatic ducts. Unfortunately, this case was taken in hand too late, and the suppuration tracked out and opened into a bronchus, with a fatal result. The rarity of this complication in India was explained by the fact that, although gall stones were nearly as common in India as in Europe, in the eastern country most of them were of the soft pigmented variety, and the hard, disease-producing cholesterin form was comparatively infrequent, at least in Calcutta. Suppurative cholangitis would, therefore, seldom give rise to difficulties in differentiation from liver abscess in the tropics. He also spoke of diffuse suppurative hepatitis produced by *B. coli communis*. He had seen this condition in a Calcutta hospital, the patient having leucocytosis with over 90 per cent. of polynuclear leucocytes. He showed a colour drawing to illustrate the condition found *post mortem*, indicating a large diffuse suppuration throughout that half of the liver which was supplied by the right branch of the portal vein, in which an extensive clotting was present, while the remaining half of the organ was healthy.

Frequency of Large Single Abscess.

In his previous lecture he had shown that multiple small amoebic abscesses were nearly always overshadowed by the acute sloughing dysentery to which they were secondary, so that they could not easily be recognized during life, still less easily treated surgically. This variety might therefore be put on one side, and they could turn with more hopefulness to the comparatively chronic, large, fibrous-walled form, and see what lessons the *post-mortem* room and the laboratory could teach them in dealing with this formerly very common and very fatal tropical liver disease.

He gave some statistics which appeared to indicate—it was not a matter for precision—that in about 70 per cent. of cases of large liver abscess the abscess was single. Among 38 cases in which there was found to be more than one abscess there were two abscesses in 44.7 per cent., three in 26.3 per cent., four in 18.4 per cent., and over four in 10.6 per cent. In this connexion he drew attention to the practical importance of the fibrous limiting wall in large amoebic abscess which he had described on the previous occasion. In friendly discussions with surgical colleagues he had often been told that the high mortality of the open operation was due to the amount of destruction of the liver tissue. This he was convinced was not the case. He showed a coloured drawing of a liver with three medium-sized amoebic abscesses side by side, with only about one-third of an inch separating one from another, and said that it might be a matter for wonder that in such a delicate organ as the liver they did not coalesce into one; but on cutting sections it was found that each abscess was limited by a dense fibrous wall, and that the liver tissue in between was perfectly healthy. Once the fibrous wall was formed there was no further destruction of liver tissue, at least as long as the cavity remained free from bacterial infection. He had twice seen six pints of pus aspirated from the liver at a single drainage, and yet a complete recovery took place. If such amounts of pus did not destroy enough liver tissue to cause death he would like to know what basis the surgeons had for attributing the mortality in open operation to destruction of tissue.

Secondary Bacterial Infection after Open Operation.

The lecturer went on to speak of the importance of secondary bacterial infection after open operation on large

* An abstract of the first lecture appeared in the BRITISH MEDICAL JOURNAL of February 11th, 1922, at p 224.

amoebic abscesses. Tropical liver abscesses were often sterile as regards bacteria, although this important fact had not until recently influenced treatment. After the opening, however, a secondary bacterial infection was almost inevitable. During the daily dressings air was sucked in and out, so that secondary infection might readily be expected in such a climate as India, quite apart from the dangers of copious discharges soaking through the dressings. It was necessary to lay stress upon these unfortunate secondary infections because he had met with surgeons in India who denied their importance, although, on the other hand, many surgeons had readily acknowledged it, and here he quoted Major G. C. Spencer, when Professor of Military Medicine at the Royal Army Medical College, who wrote:

> The chief cause of this high mortality, apart from the presence of more than one abscess, or extreme debility of the patient before operation, is undoubtedly infection of the abscess cavity by pyogenic organisms through the open wound. This is extremely difficult to prevent, no matter how much care is taken; the large amount of viscid discharge necessitates frequent changes of dressings, air and pus are sucked in and out of the cavity by respiratory movements, and it is very difficult to keep the skin around the wound aseptic, especially in a hot, moist climate. The great majority of amoebic abscesses are sterile when first opened, and every surgeon with Indian experience is familiar with the usual course of fatal cases—the patient does well for the first few days after operation, then infection occurs, the temperature goes up again, and death from septic poisoning slowly but surely follows.

If such was the experience of a distinguished army surgeon who had had to do with cases under the most favourable conditions, and early cases at that, what was likely to happen in hospitals and dispensaries where advanced cases were dealt with, and the patients came in already greatly debilitated? Enough had been said to prove that any simple method of preventing these deplorable results would be worthy of serious consideration. Such facts furnished a complete scientific basis for a much simpler and more promising method, which, together with appropriate medicinal measures, solved the problem of treatment.

Treatment by Repeated Aspiration and Injections.

Many years ago, before the present views of the etiology of tropical liver abscess were established, all abscesses were naturally looked upon as ordinary collections of pus which should be opened and drained as early as possible. There was, however, one exception: tuberculous abscesses had been treated by aspiration through sound tissues, with or without the injection of some antiseptic substance, because it was recognized that the opening of large tuberculous abscesses connected with bone diseases was often followed by secondary infections. As soon as he was able to establish that amoebae were constantly present in the walls of tropical liver abscesses, and that such abscesses were usually sterile as regards bacteria, he realized that they did not require necessarily the same treatment as abscesses due to pyogenic organisms. Accordingly he began to look for some chemical agent which might be injected into such abscesses. As early as 1902 he reported on the effects of solutions of quinine in destroying amoebae in the wall of an abscess *in vitro*. Clinically, he found that to wash out the cavities of recently opened liver abscesses with a 1 in 500 quinine solution did in fact cause a decrease in the active amoebae present, and that eventually the pus changed almost into a serous fluid. In his advocacy of repeated aspirations and injections of quinine solutions, however, he met with difficulties, because hospital surgeons were unwilling to try the method. The objection generally raised was that aspiration was not a surgical procedure, and his reply that he had never met with a patient who complained of being cured by what was not a surgical procedure was not very cordially received. But, as a matter of fact, before the days of antiseptic surgery in India, the method of repeated aspiration was commonly employed. It was only the progress of antisepsis which led to more frequent resort to open operation.

The first attempt to use his method was made in 1902 by a private medical practitioner, whose repeated punctures, however, failed to strike the abscess, which was evidently on the under surface of the liver, as was proved subsequently when it burst into the stomach. Not until 1906 was he able to record two successful cases. The first case was an acute one, diagnosed by leucocytosis with low polynuclear count, and by *x*-ray examination; 10 oz. of typical pus were aspirated through an intercostal space, and the temperature reached normal in two days, the leucocytosis disappeared in six days, the patient got up on the seventh day, and left hospital after twelve days. The second case was of a more chronic type, and was equally successful. After this he had less difficulty in getting his method tested, and in 1910 he recorded 19 cases with only three deaths, or 15.8 per cent., only about one-fourth of the mortality of open operation, and this although many of these 19 cases were of the most serious type. In a series of cases treated by Lieut.-Colonel Thurston by this plan of repeated aspirations and injection of amoeba-destroying drugs, the mortality was only 23 per cent. The number of aspirations which Thurston found necessary was one only in 26 cases, two in 16 cases, three in 10 cases, and four, seven, and eight in three other cases. Two patients recovered after 182 and 211 oz. had been withdrawn by three and by eight aspirations respectively, while in one fatal case 343 oz. were evacuated in seven punctures, including 92½ oz. at one sitting.

The reason why aspiration in earlier years—before antiseptic surgery came in—was tried and abandoned was because it was relied upon alone. It was the combined treatment which accounted for success: repeated aspirations, destruction of the amoebae in the abscess wall by appropriate drugs, and the clearing up of the bowel by suitable after-treatment. He gave up quinine after discovering the greater value of emetine hydrochloride in amoebic disease, but before making this change he had many cases of remarkable success.

One case was a European patient who had been operated on by the open method four times in as many months, and was still suffering from high fever and pain after the last operation, so that he had given up hope for himself, and, fortunately for him, the surgeon had given up hope also. Accordingly another line of treatment was tried; large doses of ipecacuanha were given, and the extensive wounds were washed out with quinine solution through the drainage tubes with which his side fairly bristled. Within three days the temperature fell to normal, the amount of discharge rapidly diminished, and the wounds soundly healed. He remained in good health, and resumed his work as a mining engineer in the tropics.

Sterile Siphon Drainage.

While the lecturer submitted that his method of repeated aspiration, combined with specific medical treatment, was the method of election, he agreed that in exceptional cases another procedure might be desirable. Even in those exceptional cases in which drainage was found necessary, however, after one or two preliminary aspirations, both the size of the cavity and the amount of discharge would be less than if the abscess had been opened immediately, so that nothing was lost and much might be gained by evacuation of the pus.

In one case at the first aspiration 86 oz. of typical pus were removed, quinine solution was injected, and ipecacuanha given orally. Within a week this patient died unexpectedly, and the *post-mortem* examination revealed apical pneumonia, quite unconnected with the liver trouble. On examining the liver abscess cavity it was found to have so contracted as to contain only 2½ oz. of thin fluid, and its fibrous wall measured almost half an inch in thickness.

He had records of complete recovery after 120 oz. had been aspirated at a single sitting. One case was that of an emaciated Indian, who had been ill for a year, and who made a perfect recovery after a single aspiration and injection of quinine solution into the cavity, and the administration of ipecacuanha orally.

The lecturer then described a method of drainage which he had worked out so that when this measure was necessary no air could enter the abscess cavity and secondary infection might be prevented. He exhibited a trocar with a flexible sheath (made for him by Down Brothers) which was left in the abscess as a drainage tube, and could be connected by a long tube to a vessel containing an antiseptic lotion. With increasing success with the aspiration and emetine treatment, however, this method of sterile siphon drainage was of comparatively less importance. At the same time it had advantages, especially in bringing about rapid healing.

He instanced a case of liver abscess treated by siphon drainage in which a preliminary aspiration of about ten ounces of pus was made through an intercostal space, and siphon drainage applied by means of a tube, the distal end of which was carried into a bottle containing antiseptic. The pus obtained at the operation proved to be sterile. At the end of the first day a few ounces of pus had drained into the bottle, the discharge was much less on the second day, and on the third morning only a little shreddy pus had drained away, and the cavity had contracted so much that the quinine injection could hardly be got in. Within a week the sinuses were soundly healed and the patient left the hospital. A year later the liver was still quite normal. The stay of this patient in hospital was less than half the shortest time of any liver abscess case in which operation had been carried out by incision through the thoracic wall.

Nature's Methods of Healing.

Nature's methods of cure of amoebic liver abscess were twofold: bursting of the abscess and encystment. The abscess might increase in size until it burst in one or other

direction. In some cases this resulted in recovery without surgical interference, as when it burst into the stomach or colon; the common extension through the diaphragm into the bronchus showed a recovery rate of over 50 per cent. Cases of rupture into the peritoneal cavity were commonly fatal. The other method of Nature's healing was by encystment, with dying out of the amoebic infection. This was less uncommon than might be expected. There were seven instances among the Calcutta *post-mortem* records of cases dying with other diseases in which this state of affairs had been found. In one instance he found an abscess which had been opened and drained during life containing both amoebae and bacteria, a second containing amoebae only, and a third encysted, without either organism. The liver abscess became encysted with emetine treatment, and he claimed that his method of repeated aspiration and injection aided this effort at encystment of the abscess by destroying the protozoal parasite in the walls and by removing the detritus. The method was, therefore, as sound in principle as it had proved to be successful in practice. The danger of haemorrhage after exploratory puncture had often been remarked, but it appeared that the greatest tendency to fatal haemorrhage was in the acute hepatic congestion of the pre-suppurative stage of the disease, and therefore such a puncture should not be done in any case in which liver abscess was suspected without first treating the patient by medicinal means to which the hepatitis at this stage was very amenable.

Summary of Results.

The lecturer projected on the screen a table comparing the mortality of liver abscess treatment by open operation with that of treatment by repeated aspiration and injection. The great majority of the cases in the first group were from British army records, extending over fourteen years up to 1907, in India. Of 2,661 cases treated by open operation the deaths numbered 1,311, or 56.7 per cent. The other group consisted of 111 cases:

	Cases.	Deaths.
Rogers at Calcutta (first series)	19	3
Thurston in Bengal	48	11
Chatterji in Calcutta	33	2
Talbot in Mesopotamia	11	0

This gave a mortality of 14.4 per cent., or one-fourth of the mortality by the other method. At the London School of Tropical Medicine 12 cases had been treated without a death, but these cases were less acute than those commonly met with in India.

In conclusion, the lecturer touched upon amoebic abscess of the spleen, a rare complication of amoebic dysentery, of which, however, he had met with several cases in Calcutta, which had yielded to repeated aspiration and injection as in the case of liver abscess. If the abscess was close to the skin the punctures could be made a little to one side. Of amoebic abscess of the brain secondary to abscess of the liver a number of cases had been reported, especially from Egypt. He had not met with it in Calcutta, probably because the brain was not usually examined in *post-mortem* cases. He suggested that the fatal effects of amoebic cerebral abscess must be mainly due to pressure symptoms, and that an early decompression operation, followed by emetine injected subcutaneously morning and evening in the hope of bringing about the destruction of the causative amoebae, as well as repeated aspiration as necessary, might be tried. There would, however, almost inevitably be some loss of brain function, even if a fatal result was averted.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE RECOGNITION OF AORTIC INCOMPETENCE.

ON reading Dr. Brockbank's article on aortic incompetence I was struck with the following remark: "I also met with it from time to time in insurance work in supposed healthy persons, men and women, and in people with *known aortic stenosis but unsuspected incompetence*." Is it not an established fact that in order to make a diagnosis of aortic stenosis three essentials are necessary: (1) a thrill over the aortic area, (2) enlargement of the left ventricle, (3) definite signs of aortic regurgitation?

Surely the mere presence of a systolic bruit at the base can in no way justify a diagnosis of aortic stenosis.

In regard to Dr. Brockbank's remarks on syphilis in aortic regurgitation the following figures may be of interest:

Comparison of the Incidence of Rheumatism and Syphilis in Aortic Regurgitation and Mitral Stenosis.

	Cases.	Per cent.
Aortic regurgitation, 121 cases:		
Admit syphilis	24	19.84
Wassermann reaction strongly positive	30	24.79 — 58.68
Wassermann reaction positive	17	14.05
Rheumatic fever / Chorea / Rheumatism	28	23.14
No history of syphilis / Wassermann negative / No history of rheumatism	22	18.18
Mitral stenosis, 97 cases:		
Admit syphilis	9	9.28
Wassermann strongly positive	9	9.28 — 26.81
Wassermann positive	8	8.25
Rheumatic fever / Chorea / Rheumatism	59	60.82
No history of syphilis / Wassermann negative / No history of rheumatism	12	12.37

Liverpool. C. H. BROOMHEAD.

ANTIMONY IN SYPHILIS.

IN the Medical Section of the Medical Congress at Cape Town in October, 1921, I referred to the beneficial effect of antimony treatment in some cases of syphilis I had treated at Durban. The injections had been given daily or on alternate days until all signs of active disease had disappeared, and in each case the salt was dissolved in boiling water just before the injection was given. It was not found necessary to use more than 1¾ grains of tartar emetic for an intravenous injection, and as a rule this was dissolved in 3 c.cm. of boiling saline. Similar success was obtained when antimonium sodium tartrate was used; but after the usual tolerance had been acquired 2 grains of this salt was injected on alternate days. The toxic effects of the treatment were not severe enough to interrupt the continuous series of injections.

CASE I.

A native had extensive anal condyloma, right-sided keratitis, and syphilides over the face, all of four months' duration, following a primary sore in November, 1920. Treatment with antimonium sodium tartrate intravenously was begun on August 30th. Though he received no other form of treatment, the rash and keratitis had disappeared in six days (after 4¾ grains), and the anal condyloma was dry. The injections were continued for another week, but the case could not be followed up further, as the Department for Public Health objected to my gratuitous visits to the Durban gaol even at the request of the district surgeon. At the commencement of treatment this case gave a strong positive reaction to the Wassermann test.

CASE II.

On September 23rd I commenced to treat an Indian with strong positive reaction and multiple scrotal syphilides which were covered with a highly offensive discharge. He received 9½ grains of the potassium salt in twelve days. The initial dose was 1/2 grain, but he was soon able to tolerate 1½ grains dissolved in 3 c.cm. of saline. On the third day the sores were dry and the offensive smell had gone. He received no other treatment during the course of injections, but commenced to take iodides and mercury by the mouth on October 4th.

CASE III.

On October 25th I commenced a series of injections of tartar emetic in an Indian who also received potassium iodide 7 grains and liquor hydrargyri perchloridi 1 drachm by the mouth thrice daily. He gave a strong positive reaction to the Wassermann test, and the skin was covered with syphilides of four months' duration. He received an initial dose of 1/2 grain, which was gradually increased to 1⅜ in 3 c.cm. saline. On the third day the rash was seen to be fading. At the end of three weeks, or after a total of 15 grains had been given, the rash was decidedly better, but still desquamating. Progress was not so evident during the fourth week. He received a total of 23⅝ grains in thirty-two days, and was given 3 c.cm. of colloidal sulphur during the fifth week. He then absconded, as he said he was fit to return to work, but the Wassermann reaction was still strongly positive.

CASE IV.

On September 17th I began treatment of an Indian employed at the "bakery." He had extensive leucoderma syphilitica of both forearms, paronychia (associated with discharge) of fingers and toes, ulceration of the right nostril and the corner of the mouth, and a badly furred tongue. I commenced with an intravenous injection of 1/4 grain and worked up to 1½ grains of the potassium