as large as the head of a fusée, producing a considerable amount of irritation and lacrymation. The protrusion may either remain, becoming invested with cicatricial tissue, or it may gradually flatten down and become nearly level with the rest of the cornea, leaving only a displaced pupil. Various opinions have been held as to whether the corneal lesions are due to the character and quality of the pus or to the degree of chemosis. It is certain that the mere contact of pus with the cornea is productive of but little harm. In cases of suppuration of the lacrymal sac pus is often poured into the conjunctival sac by regurgitation through the canaliculi, or through an artificial opening, for a considerable period without occasioning infiltration or ulceration of the tissue of the cornea, which remains bright and polished. The early period at which lesion of the cornea occurs, as well as the received views on the etiology of the disease, have led many to suspect that the pus may contain some virus capable of directly eroding its tissue. But it is obvious that a powerful disturbing influence must be exerted on the cornea by the chemotic infiltration of the conjunctiva, since, when this is strongly expressed, as it is in most cases of purulent ophthalmia, the vessels of the ciliary region must be compressed, the venous circulation retarded, and the conditions favourable to diapedesis or emigration of white corpuscles from the vessels induced. The importance of such compression is particularly well shown in cases of diphtheritic conjunctivitis, happily almost unknown in this country, though familiar enough to practitioners in Germany.

Arlt has justly observed that in the event of much chemosis and conjunctival infiltration occurring at the end of the second week, it is impossible ("Annal. d'Oc." 1880, p. 182) in all instances to preserve the cornea from becoming the seat of an abscess, and virulent blennorrhœa may be held to have been present.

If the cornea becomes generally hazy, the prospect is very discouraging. The haziness gradually deepens into opacity; the cornea becomes softened; pus forms between the lamellæ; it yields at some part of the periphery, or gives way altogether. The lens escapes, and the eye collapses, no vestige of vision remaining. In such cases mothers sometimes bring the lenses in a pill-box or wrapped in paper, saying that these had escaped from the eye, and half expecting apparently that they may be replaced.

(To be continued.)

ON DYSENTERY AND LIVER ABSCESS.¹

By SIR JOSEPH FAYRER, M.D., F.R.S.,
PRESIDENT OF THE MEDICAL SOCIETY OF LONDON.

THE following example of liver abscess illustrates a form of disease which is not very uncommon among the numerous invalids who return from tropical or subtropical and malarial climates, and is more frequent in those who have resided in India or China than in Africa, the West Indies, or other colonies. I have therefore ventured to bring this case before you under the impression that it may prove of interest, and perhaps help to throw some light on a subject which, I know from experience, is not unfrequently brought under consideration in this city and its suburbs—indeed, throughout the United Kingdom generally, in almost every part of which are to be found old residents of our tropical and colonial possessions, who have returned with the seeds of disease, sown abroad, to be developed at home. Liver abscess, of course, is not confined to tropical countries; it may, and does, occur in our own islands, but is comparatively rare, and when it does happen is generally, if not always, due to septic absorption from some external wound or operation, some ulcer of the stomach, intestine, gall-bladder, or its ducts; in certain cases to ulceration or suppuration in the pelvic cavity, rectum, or ischio-rectal fossa; to fistula in ano; it may be to cancerous ulceration in the bowel or elsewhere, or to suppuration of a hydatid cyst. Such cases are generally to be regarded as of a secondary or pyæmic character, and differ widely from the large, frequently, though not always, single abscess, which, from its frequent occurrence in the tropics, has been termed by Murchison tropical abscess, though they are very similar to, if not identical with, certain dysenteric liver abscesses in which

multiple foci of suppuration are due to septic absorption and constitutional pyæmic contamination from the dysenteric ulceration in the large intestine. As you are aware, tropical abscess of the liver is often seen in this country, but it is usually in the persons of those who have contracted the disease abroad, or who have developed it here as the result of disease from which they had suffered in the tropics. Now this form of liver abscess may be of different kinds. 1. The large single abscess, which is etiologically referable to the influences of heat, altered conditions of living, feeding, and the excessive or injudicious use of alcohol in tropical, subtropical, and malarial climates. The abscess is the expression of these pernicious influences, but it partakes more of the character of a local complaint, and is independent of ulceration of the bowel or of disease in any other part of the economy. In such cases the abscess is often large, is solitary, though there may be more than one, and is frequently preceded, especially in the strong and vigorous, by all the symptoms of active congestion and inflammation of acute hepatitis. In others, however, it assumes a more insidious and chronic form; with few well-marked symptoms, or such as escape notice, and the abscess is only revealed by unexpected bulging of the thorax, or pointing in the epigastric hepatic region, or by spontaneous evacuation of the contents through the lung, stomach, or bowels; in some rare cases it is not detected until after death, during post-mortem examination. 2. Liver abscess following, or co-existing with, dysentery, by Murchison and others was regarded as of a pyæmic nature, due to absorption of pus or septic matter from the ulcerated bowel, and therefore coming within the same category as liver abscess, originating in this country, and resembling it in its pathological character, and in being multiple. That this is the case in some instances cannot, I think, be doubted, and when the multiple abscess does occur in a dysenteric patient, perhaps no better explanation of its origin can be offered. Such a condition is, of course, one of extreme danger; indeed, it may be regarded as fatal. And here I would ask you to note the true character of these multiple abscesses, which in the outset are really no abscesses at all, but necrosis of small portions of the liver parenchyma, which, if the patient live long enough, become abscesses by suppuration occurring in the congested and inflamed liver tissue around the dead spot, which thus becomes detached and loose like the core of a boil in the centre of the cavity. I have repeatedly seen these so-called abscesses in all stages of development, from the spot of dead tissue or embolic infarct surrounded by its areola of congestion, to cavities of various sizes filled with sanies, puriform matter, and debris of liver tissue, and finally those in which real pus had formed. They are generally numerous and varying in size from a mere speck to a pea, from a marble to a walnut, an orange, or larger, and it frequently happens that they are not confined to the liver, but are found in other viscera, such as the spleen, kidneys, and lungs as well. These cases are truly pyæmic, and are, as I have said, most fatal.

It was thought by some pathologists that hepatitis and dysentery were dependent on each other. Annesley maintained that dysentery is the result of hepatitis; others that the hepatitis is the result of the dysentery. Dr. Budd, thirty-five years ago, put forth the opinion—and his view has met with much support in this country, though not in India—that liver abscess is always due to purulent absorption from the bowel, that, in fact, tropical liver abscess is pathologically identical with the liver abscess of this country. Dr. Abercrombie thought that though they co-existed they were independent of each other. Murchison, Macpherson, Maclean, and others concur in this. Martin and others thought that liver abscess was intimately connected with disease of the cæcum, but this has not been confirmed by post-mortem examination; for of 72 cases where the cæcum was affected in only 22 was there liver abscess. Moore of Bombay says that eight observers out of twelve record a percentage of 18, or 295 cases of liver abscess in 1532 of dysentery cases; four others give a ratio of 39 per cent., or 52 cases of abscess out of 131 cases of dysentery; 18 per cent. is probably the correct ratio. The larger percentage is more likely due to all diseased conditions of the liver that have accompanied dysentery. Recent observations, I think, confirm this view of the relative frequency of hepatic abscess in connexion with dysentery, and though in some instances of multiple abscess the condition is due to septic absorption, yet liver

¹ Read before the Medical Society of London, April 30th, 1883.

abscess generally must be regarded rather as an expression of the general disease than as a direct consequence of dysenteric ulceration of the large intestine. It would appear, then, that in different climates it is more or less frequent according to circumstances, but that there is a greater tendency to it in India than in other climates. In malarious countries liver abscesses frequently occur in association with remittent fever without any ulceration of the bowel (Morehead). Macpherson gives the comparative frequency of liver abscess in dysentery as varying from 13 per cent. in the General Hospital, Calcutta, to nearly 60 per cent. (according to Annesley) occurring in Madras.

I think it must be admitted that liver abscess and dysentery are often coexistent, or that one may follow on the other very closely, and that in a certain number the hepatic abscess is due to absorption from the diseased bowel, yet that the two diseases occur frequently, nay generally, quite independently of each other. Numerous post-mortem examinations have shown that liver abscess was unaccompanied by any signs of present or past ulceration in the bowels, whilst equally numerous cases of death from dysentery were unattended by abscess in the liver.

For the present I exclude from consideration the large single tropical abscess, in which there is no question of a dysenteric origin or complication, and now wish to direct attention to the question of the relations of liver abscess to dysentery when the symptoms of both diseases are present. The case I bring under your notice this evening is an example in point; and I would ask you to observe that although true dysenteric—i.e., pyæmic—abscess of the liver is of not uncommon occurrence, and is to the last degree dangerous, yet that not all abscess of the liver complicated with dysentery is of this grave form, and that a man may have dysentery and liver abscess too, and still may recover. And here I would remark that, although I regard some of the cases of dysenteric liver abscess as merely the result of a common cause affecting alike, though independently, both liver and bowel, yet that in others I believe the liver abscess may be the consequence of direct absorption of purulent matter through the liver from the bowel; in which case the abscess may be single or double, or triple, but this is a different state of things pathologically from that general pyæmic condition which results from infection of the whole system by absorption of septic matter from the degenerative ulceration; in which cases the mischief is multiple, and often general.

The relation of liver abscess to dysentery, I should say, might be briefly summarised as follows:—

1. The so-called abscesses which originate in local deaths of parenchyma (pyæmia, embolic deposits, or infarcts) are cavities varying in size from a mere speck to an orange, containing débris, sanies, puriform matter, leucocytes, and, finally, pus. They are seen in various stages of development, and are not necessarily confined to the liver, but occur in other viscera or regions of the body. These are truly pyæmic.

2. There is, I believe, a form of liver abscess co-existent with, and perhaps due to, dysentery, which is the result of direct absorption and transference of pus or septic matter from the bowel to the liver through the mesenteric veins. Such may be solitary, double, or triple. This is also a very dangerous form of the disease, though not necessarily fatal, as it is feared must always be the case in the former variety.

3. Dysentery, malarial fever, and hepatitis may co-exist, or supervene on each other as effects of common climatic cause; it seems natural to ascribe the liver abscess in such cases to the dysentery, but it is probable that they are rather coincidences than consequences of each other, and that the cause which affects the glandular structures of the large intestine may determine the mischief in the liver in certain climates and localities; such are obviously very different from those previously mentioned.

4. Lastly, I may just allude to the ordinary large and most frequently single tropical abscess, which is quite independent of dysentery, though, as just mentioned, it may co-exist with or follow it. Each or all of these forms may be brought under our notice in this country as the result of disease originally contracted in certain climates.

As to the extent to which hepatitis prevails in India the last statistical report gives the following information:—"In the European Army of India, averaging 57,742 men, 28,780 admissions and 1267 deaths were recorded under hepatitis during the ten-year period 1870 to 1879. This gives an admission rate of 49·8 and a death-rate of 2·19 per 1000. In the Army of Bengal the admission rate was 47·1 and the death-rate 2·04 per 1000. In the preceding ten-year period

the admission rate was 59·2, and the death-rate 3·31 per 1000. A considerable reduction has thus taken place in both the admission and the death-rate, and the diminution has been pretty evenly distributed over the different sections of the Presidency. There were 7417 admissions and 349 deaths from hepatitis in the European Army of Madras during the years 1870 to 1879, an admission rate of 67·2 and a death-rate of 3·31 per 1000, much higher rates than those for Bengal. During the immediately preceding ten-year period the admission rate from hepatitis was 70·2, so that very little diminution has taken place in the frequency of this disease. During the period 1870 to 1879 there were 4234 admissions and 177 deaths from hepatitis in the European army of the Bombay Presidency, the admission rate being 40·9 and the death-rate 1·71 per 1000, slightly less than the corresponding rate for Bengal. For the years 1863-69 the average admission rate from this disease in Bombay was 26·6 per 1000. Hepatitis thus seems to have been more prevalent of late in the Bombay Presidency, an experience opposed to that of Bengal and Madras." The eighteenth annual report of the Sanitary Commissioner General of India for 1881 tells us that the admissions for hepatitis per 1000 men strength for that year were: Bengal 32, Madras 39, Bombay 29. The deaths per 1000 in the same period were: Bengal 1·64, Madras 1·54, Bombay 1·52 from the same cause. It further remarks that "of the chief diseases hepatitis was the only one which during 1881 yielded a higher death-rate than the preceding year—1·60 per 1000, against 1·34. The increase was, however, very trifling, and the admission rates are nearly identical. In Madras hepatic diseases in former years have prevailed to a greater extent than in the other Presidencies. The returns during the last two years have been very favourable, compared with the preceding ten-year period. Also that after anæmia and general debility the chief causes of invaliding in the army of India were: hepatitis, 2·96 per 1000; dysentery and diarrhœa, 2·83; phthisis, 2·21." As a great proportion of the deaths recorded under hepatitis were probably due to liver abscess, it will be seen how large the experience of the disease is in India.

With reference to the relative proportion in which liver abscess and dysentery were coincident or combined, Dr. Waring,² in 1854, made the following notes:—

Of 300 cases of fatal liver abscess in India, in only 82 cases, or in 27·3 per cent., was the hepatitis preceded by symptoms of dysentery. Of the 300 cases, the number of abscesses was not stated in 12. Of the remaining 288, 177 had one abscess, 33 had two abscesses, 11 had three, 17 had four, 10 had from five to ten or more, and 40 had more than ten.

Relative Frequency of Hepatitis in different Foreign Stations (Fayrer, Tropical Diseases.)

MADRAS.						
Year.	Strength.	Disease.	Admitted.	Died.	Invalided.	
1870	9936	Hepatitis	635	41	131	
1871	10,684	Hepatitis	713	41	58	
1872	10,892	Hepatitis	586	5	70	
—	—	Abscess	43	35	—	
CHINA.						
1870	546	Hepatitis	15	0	1	
1871	516	Hepatitis	8	0	0	
1872	789	Hepatitis	15	1	0	
—	—	Abscess	1	1	—	
CAPE AND ST. HELENA.						
1870	2441	Hepatitis	66	4	16	
1871	2473	Hepatitis	24	0	6	
1872	2484	Hepatitis	23	1	3	
WEST INDIES.						
1870	1432	Hepatitis	2	0	0	
1871	966	Hepatitis	12	0	0	
1872	1112	Hepatitis	2	—	2	
—	—	Abscess	1	0	0	
CANADA.						
1870	4519	Hepatitis	10	0	0	
1871	2383	Hepatitis	12	1	1	
1872	1602	Hepatitis	3	0	9	
MALTA.						
1870	4799	Hepatitis	26	5	6	
1871	4977	Hepatitis	26	2	7	
1872	4855	Hepatitis	27	0	4	
—	—	Abscess	2	1	0	

I will conclude what I have to say with a few remarks on the question of puncturing liver abscess. In cases of true

² Inquiry into Abscess of Liver. (Memorandum, 1854, p. 125.)

pyæmic multiple abscess, even should the indications of the locality of these abscesses be clear, I fear no permanent benefit could be anticipated, though I think it is possible that if any one abscess caused much suffering the contents might be drawn off by an aspirating needle, and so temporary relief might be conferred. In cases where there is reason to believe that the abscess is single, and where bulging, pain, spasmodic contraction of rectus, and tenderness on pressure exist, whilst previous symptoms suggest the presence of pus, the condition may be verified by introducing a needle and examining the fluid drawn off through it. If it be pus the sooner it is all removed the better, and if it lie too deep for a free incision, by reason of the danger of cutting through the vascular liver substance, then I recommend you to draw it off through a large cannula, and, having done so, introduce a drainage-tube, taking care to exclude the entry of air; wherever it is possible I advocate a free incision, and a free drain through a drainage-tube, and for cases in which the matter lies deep I have devised a grooved cannula, on which you can enlarge the opening, and having given exit to the pus, introduce the drainage-tube. I may here remark that a certain amount of vascular liver tissue may be cut through to get at an abscess; the hæmorrhage will be profuse, but it will soon cease. I believe it is very essential that the antiseptic method of treatment should be strictly attended to, and you may, perhaps, remember a case which I had the honour of relating to you some time ago, in which it was attended with complete success. I advocate exploration to ascertain the presence of pus, early evacuation whenever it can be got at, and early and free opening; drainage, and antiseptic dressing whenever practicable.

CASE 1. *Dysentery and Liver Abscess opening through the Right Lung; Recovery.*—A young civil officer, aged twenty-four, of good constitution and temperate habits, had been in India about three years and a half. When with the forces in Afghanistan in Nov. 1881, he was attacked with erysipelas of the head and face whilst suffering from an attack of climatic fever. He was recovering from this at Sibi, when he was attacked with diarrhoea, which soon became dysentery. He was then sent off to Kurrachee, where he arrived early in January, 1882, and remained there under treatment. On Jan. 23rd, having improved in health, he went to Kinari, on the coast, but on the 27th, again feeling ill, with great lassitude, depression, and pain in the side and shoulder, with loss of appetite and sickness (these symptoms supervened, it is to be observed, just as the dysenteric symptoms were subsiding), he returned to Kurrachee, and was again placed under active treatment. He had fever and a temperature of above 100°; exact degree not noted. On Feb. 13th he was put on board a steamer and sailed for Bombay, where he arrived in three days, much improved by the sea voyage. On the 20th he left Bombay, crossed India by rail, and arrived at Monghyr on March 1st. During the month of March he had frequent recurrences of fever and pain, but contrived to do duty. Towards the end of the month he was seized one day, after riding twenty miles, with severe pain in the left side, which was attended with swelling. This was pronounced by the medical officer to be the result of a muscular strain, the consequence of a long ride on a rough, high-actioned horse. This pain and swelling subsided in about a week. He appears to have struggled on doing his duty as best he could until May, when great depression and utter inability to work came on. The medical officers reported his liver to be then much enlarged, and recommended that he should be sent to England at once. He, however, remained at Monghyr for some weeks. Towards the end of May he appears to have improved slightly, and so he continued till the middle of June, when sharp pain in the hepatic region, with difficulty of breathing, set in. A few days later, after dinner one day, a paroxysm of coughing set in, during which he brought up the contents of a liver abscess through the right lung. There were altogether five or six copious discharges of pus and blood by this channel, profuse at first, but diminishing with each attack. The last occurred on August 20th. On Sept. 4th he left India, and arrived in England in due time greatly improved by the voyage. A week after arrival he got a chill, which brought on a return of the liver pain. He was again confined to bed, and had poultices and nitro-muriatic acid. In October, being much better, he went to the south of England, and remained there till Dec. 12th, when he had a relapse. In January the right lung and pleura became affected, but he recovered (he seems to have

had no further discharge of pus from the cavity), and since then has gradually regained his health and strength. In April, beyond feeling weak, he was well, and there is every reason to believe that he may be able to return to his duty by the next cold season.

This case traces in an interesting manner the passage of formation of a liver abscess and its relation to a previous attack of dysentery, which I am inclined to think was not of pyæmic character. It also gives a good idea of the difficulties and vicissitudes to which a patient may be exposed in India, and the vast extent of country over which he may have to travel before he finds relief.

CASE 2. *Dysenteric Multiple Abscess of Liver.*—G—, a Hindoo, aged twenty-four, was admitted Aug. 7th, and died Aug. 16th, 1880, at the Medical Hospital, Calcutta. Had diarrhoea and dysentery for a month; great pain over colon; fever; temperature ranging from 96.4° to 102.6°. Had passed sloughs with the gelatinous mucus and blood; no pain in the hepatic region. The post-mortem was made on Aug. 17th, twelve hours after death. Refer to "Tropical Diseases," page 91, for description and for Mr. Doran's examination of the liver, which is now in the College of Surgeons.

OCCASIONAL RECORDS IN THE SCIENCE AND PRACTICE OF SURGERY.

By OLIVER PEMBERTON, F.R.C.S. ENG.,

SENIOR SURGEON, BIRMINGHAM GENERAL HOSPITAL, AND PROFESSOR OF SURGERY IN QUEEN'S COLLEGE.

LOOSE BODIES IN THE KNEE-JOINT.

It must be accepted that our knowledge of the exact mode in which "loose bodies" form in joints is, to say the least, at this day uncertain. Practically our experience arises only from what happens in the knee; for although met with occasionally in the elbow and even the hip, they so seldom call for interference, and are comparatively so unimportant, that further reference to their presence elsewhere than the knee is unnecessary. That their origin in early adult life is in the main traumatic, I for my own part entertain little doubt. The pursuit of football may be fairly charged with establishing abundant proofs as to this. Thus, a few years since, I saw a gentleman of much muscular power, who, previously to encountering the struggle of the game on a given day, had sustained no injury to or had had any disorder of the knee whatever. He had fallen during the fight, and being unable to rise was carried off the field, and I was called to see him a few hours after the occurrence. When I examined the knee I found a considerable effusion had taken place within the joint, so as to render any exact judgment as to what had happened impossible. The effusion subsided with rest and he was able to walk; but in a few weeks came to me and said something moved in and outside the joint and had nearly thrown him down once or twice in walking. On examination I readily detected a movable body, about as large as an almond, situated just above the level of the patella on the inner side. I pointed out to him the desirability of removal, but he preferred a supporting case and I saw no more of him. After forty years of age the rheumatic diathesis exercises a chief influence in the production of the "loose body" leading to that typical calcification seen so frequently in the joint structures of aged rheumatic people. Assuredly my own experience leads me to the conclusion that injury is the chief factor in causing a chipping or breaking off of the joint surface, and that as time goes on the loose body thus produced is found to present appearances according to its age and, as it were, to the extent of the wear and tear in movement it has undergone: at one time being cartilaginous or fibrous, or osseous or mixed, as the case may be, the ultimate shaping and structure of the body being doubtless greatly influenced by the predominance of the rheumatic habit.

Those curious in the investigations as to other and widely different modes of origin, would do well to refer to the ninth chapter in Mr. Barwell's¹ treatise on diseases of the joints, and it must never be forgotten that Hunter's view as to the changes that blood effusions may assume, and so develop into these bodies, has always been regarded as a practical

¹ London, 1881, p. 267, Macmillan & Co.