cases of dysentery and only one case of liver abscess (in gaols all cases which die are examined *post mortem*). This ounce of fact—the great rarity in natives of liver abscess contrasted with the abundance of dysentery—should be remembered in discussing the question.

AN EPIDEMIC OF MALARIA ON BOARD SHIP, WITH A RECORD OF BLOOD EXAMINATIONS.

By D. C. REES, M.R.C.S., L.R.C.P.,
House-Surgeon, Seamen's (Branch) Hospital, Albert Dock, E.

OUTBREAKS of malarial fever in ships at sea have been frequently recorded, but, so far as I am aware, in none of these has there been a systematic examination of the blood for the plasmodium. I thought, therefore, that an account of a ship epidemic in which such an examination was made might be worth recording. The ship in question—a steamer, with a mixed crew of Europeans and natives, numbering ninety-one in all—left Glasgow on August 4th, 1897, and arrived at Calcutta on September 3rd. She remained at this port, lying alongside the quay, for seventeen days. The weather all the time was extremely hot and oppressive. She started on the homeward voyage on September 20th, the health of the crew at this time being good. Water had been taken on board in Calcutta, and stored in the ordinary covered tanks. The first port touched at was Colombo, which was reached on September 25th. The ship remained here only a few hours, and was anchored just inside the breakwater, some 400 yards from the shore. A fresh supply of water was taken on here. The health of the crew was still good. Nine days after leaving Colombo, while the ship was in the Red Sea, one after another of the crew became affected with fever; the exact number of cases is not known, but there is a definite history that 22 men were laid up at this time; 3 of these were Europeans—namely, the second and third engineers, and 1 quartermaster; the remaining 19 being natives—namely 1 quartermaster, 1 saloon butler, 1 messroom boy, 1 chief cook, 1 barber, 1 Lascar, 1 deck boy, 1 Lascar cook, 5 firemen, 1 coal trimmer. The sick were treated by the ship's surgeon; some apparently recovered quickly, some suffered a relapse after about six days, and some were sick during the rest of the voyage. The ship reached London on October 25th.

CASE I.

The above account is not so complete as could be wished, but unfortunately I have been unable to communicate with the ship's surgeon, and consequently I have been obliged to

rely on the ship's officers and the patient's themselves for these details. Four of the crew were admitted to this hospital under the care of Dr. Manson. The following is a brief summary from the notes of each case.

CASE 1.—J. M. A., quartermaster, aged 27, a Scotchman, had been at sea for fourteen years, but never had malaria or any other illness before. He went on shore at Calcutta on one occasion only for an hour and a half. He did not land at Colombo. His first attack of fever occurred on the ninth day after leaving Colombo, and he suffered with attacks off and on during the rest of the voyage. He was admitted on October 27th. Temperature 105° F., sweating, and anæmic; spleen enlarged and tender; the other abdominal viscera normal; thoracic viscera normal. Blood examination revealed a double benign tertian infection, one group of the parasites being in the early non-pigmented stage, and the other group being in the large pigmented intracorpuscular stage, and occupying about two-thirds of the red corpuscle. The subsequent clinical features of the case were those of a typical double benign tertian ague.

His temperature chart demonstrates very well the double character of the fever. Thus on October 27th and 29th rigor occurred at noon, and the temperature rose approximately to 105°, whereas on October 28th and 30th rigor occurred between 2 and 3 P.M. approximately, and the temperature rose to 103.2°. Quinine was given on October 27th during the sweating stage. It was interesting to observe that the drug destroyed the plasmodia liberated on that day, and which otherwise would have matured and caused a paroxysm on the 31st; whereas it failed to affect the half-grown parasites born on the 28th; these matured on the 30th, the rigor occurring at the expected time. Blood examination on the 30th, before rigor, revealed a single infection only. No relapse took place, and the patient was discharged as convalescent on November 4th. His blood was free from parasites and spleen much reduced in size.

CASE II. D. B., quartermaster, an Indian, had been at sea all his life. He stated that he had suffered from fever before, but not during the last eighteen months. He went ashore repeatedly at Calcutta, but not at all at Colombo. The first attack of fever occurred on the ninth day after leaving Colombo. He had daily bouts of fever on the next six consecutive days. He was treated by the ship's surgeon, and remained free from fever until two days before admission. He came to the hospital on October 26th, looking very ill, with staggering gait, sweating, and vomiting bilious material. The temperature was 103.6°. He was cachectic, the spleen was enlarged and tender, and the liver was enlarged. Blood examination revealed many small ring parasites; doubly infected red corpuscles were frequently met with; brassy bodies and pigmented leucocytes were also observed, but at that period of illness no crescent bodies. Antipyrin was given to relieve his distress. He had a rise of temperature on the next two days, but no definite chill occurred. Quinine was given

CASE II.

on October 30th, and the fever did not recur. The blood was examined daily. Crescent bodies first appeared on the fifth day after admission, that is on the seventh day from the onset of the last attack of fever. The crescents subsequently became very numerous, four or five being present in each field. Exflagellation took place with great readiness, occurring in five minutes if the slide was breathed upon, or if the droplet of blood was exposed on the finger for 20 to 30 seconds. He was discharged by his own wish on November 16th much improved, a few crescents being still present in his blood.

CASE III.—A. B., a Lascar, was admitted on October 29th. No reliable history as to dates could be obtained, but the native quartermaster testified to the fact that he was laid up with the rest of the crew in the Red Sea. The temperature was 102°; he was sweating and anæmic; the spleen enlarged. Blood examination revealed a large number of small ring parasites, and some pigmented leucocytes; no crescents found. On

[illegible]

patient being so anemious myeloidosis was again indicated. In addition, a local trimmer, an Indian, presented himself at the outpatient department for malarial fever. He was a native of the Red River valley, was a native of the Red River valley, and was extremely ill and wretched. On ascertaining that he came from the same ship as the above cases, and suspecting from his appearance that he was the subject of malarial infection, we examined his blood. Many crescentic bodies and pigmented leucocytes were found. He was admitted. The temperature was normal; the spleen moderately enlarged, and he was markedly cachectic. He said that he had been ill when the ship was in the Red

Another interesting feature of the outbreak is that while some of the crew became infected with the benign tertian parasite, others contracted the æstivo-autumnal or crescent-forming parasite—the exact proportion of examined cases being 4 benign tertian and 6 æstivo-autumnal. Laveran leads one to infer that he believes that the same source of infection may give rise in one individual to the large benign parasite, and in another individual to the small malignant parasite. This epidemic to some extent seems to bear out his views on this point. Our knowledge of the extracorporeal phase of the malarial parasite must be much more complete, however, before we can definitely settle a point such as this. It seems conceivable that at the onset the infection may have been a very mixed one, and that for some unknown reason in one man the benign tertian form predominated, and the malignant form became suppressed and failed to multiply in the body, and that in another man the reverse took place.

It is noteworthy that the incubation period appeared to be the same for the two forms of the parasite, for the two quartermasters were both taken ill on the ninth day after leaving Colombo, one with benign tertian, the other with the small malignant parasite.

It has been said that Europeans are more likely to contract the malignant malarial infections, and natives the benign forms; the reverse, however, occurred in this outbreak.

Rogers in his recent work on kala-azar states that the crescent body is rarely met with in Indian fevers; this outbreak does not bear out his assertion, but concurs rather with the experience of Ross, Carter, and others, who affirm that the crescent parasite is frequently seen.

I beg to acknowledge the kindness of Dr. Manson in giving me permission to publish these notes, and also for the trouble he took in confirming my diagnosis of the blood parasites.

THE EFFECTS OF A CHILL DUE TO A SUDDEN CHANGE IN TEMPERATURE, AMOUNTING TO 150° F.

By CHARLES D. MUSGROVE, M.D. EDIN.,
Penarth, Wales.

In September, 1894, on board a steamer, of which I was surgeon, while crossing the Indian Ocean, 5 degrees south of the equator, an engineer, with his fellow engineers, was called upon one afternoon to undertake some repairs in a chamber which was situated immediately above the boilers, and surrounded by the tubes leading from the furnaces to the funnel. The temperature in this compartment was 160° F., and on this account the work had to be conducted in spells of two or three minutes at a time, as it was found that by the end of even this short period the men were threatened with symptoms of heat apoplexy. In the intervals the men came out to "cool" themselves on deck, where the heat was of course excessive at that time of day. After an hour or more of this the work was completed, and the engineer in question entered the compartment once more for the purpose of making a final inspection. He was attired in the thinnest of cotton suits, and perspiration was pouring off him from head to foot; and it was in this condition that on emerging from this atmosphere of 160° F. he immediately descended and entered the refrigerating chambers, where the temperature was more than 20° F. below freezing point, in fact few degrees above zero; the walls and floors were covered with a thick coating of snow. Without even an overcoat or a scrap of clothing in addition to his sweat-saturated cotton suit, he remained for a quarter of an hour in this atmosphere.

On retiring to his cabin he had a headache, and spent a restless night. When I saw him at 8 A.M. next day his temperature was 104° F., the pulse and respirations rapid. He was shivering violently, and was lying on his side with his knees drawn up on account of severe pain in the abdomen, the walls of which were rigid and acutely tender to pressure, sufficiently so to indicate that peritonitis was present. The bowels were costive, but this condition gave place during the next day or two to diarrhoea, with motions characteristic of inflammation of the lining membrane of the colon. The urine was loaded with albumen; circumstances did not permit of a microscopic examination for casts. In the chest there were rhonchi to be heard at various parts, with patches and tubular breathing, and signs of pleurisy, with doubtful effusion at the bases behind. Over the heart, in the second and third left interspaces close to the sternum, there was a to-and-fro friction murmur heard, but it was indefinite in character, and he could not hold his breath so as to enable one to differentiate it; it disappeared in the course of a day or two, and was not accompanied by any irregularity in the pulses, so that it was probably not due to pericarditis.

The progress of the case was characterised by a gradual subsidence of all the symptoms, and by an absence of anything in the nature of a crisis. From the afternoon of the first day the temperature and pulse-rates fell steadily, and by about the fourth day they had reached the normal. The abdominal pain became less intense, and in forty-eight hours

had disappeared, and the diarrhoea which had supervened passed off a couple of days later. The pulmonary symptoms abated also, and by the end of the first week the lungs had completely cleared up. By the end of this period also the amount of albumen in the urine was a mere trace, and within ten days from the onset of the illness the patient was in comparatively good health, and able to resume his duties. One point of interest is that throughout the case there was an entire absence of any rheumatic symptoms or pains in the limbs or joints.

Such an experience as this, involving a sudden variation in the temperature of the surrounding air, amounting to 150° Fahrenheit, must be almost unprecedented, and the surprising fact, to my mind, is that the congestion which occurred in consequence of it left no evident permanent change behind. Probably the widespread nature of the congestion was the patient's safeguard, as the view may be held that the engorgement of each organ would act to some extent as a drain or a poultice to that of the other organs, thus preventing any great amount of inflammatory effusion in any particular viscus.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

THE CLINICAL VALUE OF ENLARGEMENT OF THE SPLEEN.

In all textbooks of medicine, uniform enlargement of the spleen is mentioned very prominently, as a symptom in certain common diseases. The chief are—leukæmia, engorgement from cirrhotic liver, amyloid disease, tuberculosis, peritonitis, acute miliary tuberculosis, malaria, pyæmia, erysipelas, typhoid fever, and some other zymotic diseases.

How often have those who have carefully searched for splenic enlargement actually discovered it? Of course, in surgical conditions of the spleen, one can do much both by percussion and palpation, but in the majority of likely medical cases, one rarely feels satisfied that enlargement of the spleen exists. In some cases of thin children, when the fingers can be doubled in under the edge of the ribs, the spleen can be readily felt. There can, however, be no doubt that enlarged spleen is a very valuable symptom, but it is a mistake to exalt its clinical significance seeing that it is usually only found *post mortem*. One may safely say that many famous physicians have failed to recognise enlarged spleens which have been proved, *post mortem*, to be twice the normal size. The most cautious decline to say that a spleen is enlarged till they actually feel it.

Physiologists have shown that the spleen is actively engaged in important metabolic processes. It has a very distensible capsule and plexus of veins. Even in good health it varies much in size, being largest about five hours after a heavy meal. This would constitute an initial difficulty as to the normal size of the spleen in the living subject. The spleen is also a very movable organ. If a patient be corpulent with much fat in the great omentum, if the stomach and adjacent colon be overloaded or the reverse, if the over-lying lung above be diseased, or if there be pleuritic adhesions, if the kidney be larger than normal or have much perinephric fat, obvious difficulties will arise in percussion and even in palpation.

Different percussors will bring out different results. It is wise, therefore, to warn the student not to be disappointed at not being able to discover enlarged spleen in all diseases where it is found *post mortem*. By all means let him try to discover it.

ROBERT TURNER, M.A., M.D., F.R.C.S. Edin.

Eastwood, Notts.

YAWS IN MOTHER AND INFANT.

M., the wife of a native official at Nailaga, was confined of a child on February 26th, 1898. She was attended on the same day by Avisai, the native practitioner from whom I gathered the history of the child previous to March 17th, on which day I saw them both. The child was reported to me to be suffer-