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## Original Communications.

### A YEAR'S WORK ON THE MEDICAL SIDE OF A WEST AFRICAN MILITARY HOSPITAL.

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WE left England in May, 1941, and, apart from the depth-charging of a whale by one of our escorting destroyers, the journey was uneventful. Our 600 bedded hospital nucleus was an old military barracks, our knowledge of tropical medicine that acquired during a two weeks' course at the London School of Tropical Medicine. From the start we had the co-operation of the local Colonial Medical Officers whose expert advice helped us to solve many of our initial clinical problems. The medical team consisted of an O.C. Medical Division, a graded Medical Specialist and four General Duty Officers. The survey period is from July, 1941, to June, 1942. During this time 10,770 patients were admitted and of these 2,850 were white Service personnel and 7,920 native.

#### SECTION 1.—WHITE SERVICE PERSONNEL.

Medical cases formed 62 per cent of the total admissions. Table I shows the monthly rates of the six principal medical disease classes. The following were some of the other cases admitted to medical wards: Syphilis (38), Bronchitis (26), Psychoneurosis (24), Jaundice (21), Peptic Ulcer (18), Lymphogranuloma inguinale (13), Glandular Fever (7), Gastritis (7), Organic Nervous Diseases (4).

TABLE I.

Disease	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apl.	May	June	Total
Malaria ..	233	228	67	86	39	58	47	45	14	47	68	106	1,038
P.U.O. ..	18	6	2	0	4	0	18	11	21	9	20	57	166
Gastro-enteritis ..	22	3	8	14	18	8	9	12	15	13	22	38	182
Amoebic dysentery	0	1	4	4	5	6	3	3	6	7	10	13	62
Bacillary dysentery	0	0	0	10	6	6	3	1	6	6	5	13	56
Gonorrhœa ..	7	6	4	7	8	12	12	8	8	8	10	5	95

*Malaria.*—This disease alone was responsible for 64.5 per cent of the total white medical admissions. Of the 1,038 cases, 567 (54.6 per cent) were admitted during the months of June, July and August. During these months the majority of the odd 200 inches of rain

per annum falls. Malaria was responsible for more deaths and invalidism than any other group of diseases put together.

The Japs having grabbed most of the world's quinine stocks, we instituted as our standard treatment a combined course of quinine and mepacrine hydrochloride. Taking it all round, this treatment worked very satisfactorily. Most of the cases were malignant tertian infections. Quinine gives quicker initial control than mepacrine so that, for the first forty-eight hours, 10 grains of quinine bihydrochloride were given t.i.d. After that, 0.1 gram mepacrine hydrochloride was given t.i.d. for the next five days. On this regime the majority of cases were apyrexial by the fourth day. After a forty-eight hours' rest period, 0.01 gram of plasmoquine was given t.i.d. for four days. In spite of controlled quinine "prophylaxis" many cases of reinfections or relapses were admitted, some patients having six or more attacks in a year. As there is evidence that some people do not metabolise quinine to exert a proper antiparasitic action it would be of interest to use mepacrine as a "prophylactic" and see whether there would be any improvement in the admission rates for malaria. Military statistics suggested an attack rate of 100 per cent per annum and in some parts even 200 per cent but, by means of screening, spraying, drainage, etc., it has been shown that the incidence of malaria can be cut down to infinitesimal levels in this hyperendemic area. These results may be achieved with all static units such as air bases, camps and coastal defence batteries but, in wartime, mobility may render such measures impracticable.

There are certain danger signs which call for a different scheme of treatment. Cases showing "low fever" with muddy skins and slightly jaundiced sclerotics, patients with severe anæmia, oliguria, vomiting, diarrhoea, hyperpyrexia, dehydration, algid symptoms or those with signs in the C.N.S. indicative of an impending cerebral malaria require, in addition to immediate symptomatic treatment, the use of specific drugs in such a way as to bring the infection under as rapid control as possible. If cerebral malaria threatens, I prefer to give 10 grains of quinine bihydrochloride in 20 c.c. normal saline intravenously and repeat four-hourly if necessary. There are few more urgent medical conditions. In the other types of case I used mepacrine hydrochloride, if necessary giving it by intramuscular injection. In urgent cases I prefer to rely on mepacrine as it gives a more uniform and reliable control. The only exception to this is cerebral malaria.

We were disappointed with the results of treating M.T. malaria with sulphadiazine which appeared to have little antiparasitic action.

*Cerebral Malaria.*—This is a more dangerous complication of malaria than blackwater fever. We had six cases, four of whom died. One patient was a Chinaman admitted off a convoy. He had been in coma for two days without treatment and died soon after admission. The Fleet Air Arm flew me up to a remote jungle outpost to see the next case and on my arrival I found a British serjeant dying in deep coma. The two other patients who died had an apoplectic onset about the fourth day after their attacks started. Few cases recover under such circumstances, the onset of coma usually being a death warrant. It is very important to keep all cases of M.T. malaria under close observation so that signs indicative of involvement of the C.N.S. may be observed at the earliest moment. In this way, it may be possible to prevent the onset of coma by starting immediate intravenous quinine therapy.

The two cases who recovered had initial signs of C.N.S. involvement, one a facial palsy, the other a partial hemiplegia. Other warning signs are excessive tiredness or lassitude, drowsiness, restlessness, intense generalized headache, neck stiffness, ophthalmoplegias, nuclear paresis, mental changes, vomiting, paræsthesias, numbness or motor weaknesses.

We do not know the mechanism underlying this condition. The pathological lesion is the production of emboli composed of wads of parasites and malarial pigments. I observed in one of these cases as many as four parasites in one red blood corpuscle. Such cells must be less resilient than unparasitized corpuscles and therefore less capable of compression. Perhaps the red cell membranes of these patients are tougher than usual and become as logs in a narrow stream and soon begin to pile up one on top of another. The object of treatment is to destroy the parasites as quickly as possible. In addition to intravenous quinine, lumbar

puncture should be carried out. This relieves extraneous pressure on the cerebral capillaries and so helps to widen their bore. Intravenous injections of hypertonic glucose also help by osmotically increasing the intravascular fluid volume. Anticoagulants such as Dicumarol might prove of great benefit in this condition.

*Blackwater Fever.*—We treated eight cases and had two deaths. One of the fatal cases was a merchant seaman who developed blackwater three days out from port and had improper treatment before admission. He passed  $1\frac{1}{2}$  ounces of urine in ten days and died of uræmia. Three of the patients were having their first attacks of malaria.

In blackwater fever the patient hæmolyses his own red blood cells. Without any treatment this hæmolysis may cease and the patient recover. This fact must be kept in mind when treating these interesting cases. The hæmolysis appears to be the outcome of an immunity system set in motion by the introduction of malarial parasites into the body. Recovery takes place if the patient can manufacture sufficient anti-hæmolytic substances. Recent *in vitro* experiments have shown that tissue extracts can stop such an hæmolysis.

There are three principles of treatment. Firstly, to interfere as little as possible with the developing anti-hæmolytic mechanism. Secondly, to encourage the elimination of toxins, pigments and hæmoglobin derivatives by urinary alkalization and an adequate fluid output. Thirdly, to combat anoxia at the right moment by blood transfusion and oxygen therapy.

As blood transfusion may interfere with the first principle of treatment it is worth while to study some points in regard to the hæmolysis. In some cases, the hæmolysis is acute, continuous and severe. In others, it starts acutely and then tails off gradually or intermittently. In the third type the hæmolysis proceeds in stops and starts. A clinical analogy would be a case of hæmatemesis from a bleeding peptic ulcer. It becomes a question of whether to transfuse, when to transfuse and how much to transfuse. The three types of hæmolysis are shown diagrammatically in figs. 1, 2 and 3.

As soon as hæmoglobinuria commences, attempts to step up urinary output should be started. Venoclysis is the most rapid and controllable method. Solutions used are normal saline, bicarbonate saline (sodium bicarbonate 160 grains to the pint) and 2 per cent glucose saline. An average flow rate is 100 c.c. per hour (2,400 c.c. in twenty-four hours). The urine must be kept alkaline throughout the hæmoglobinuria. Glucose is given orally or intravenously to promote diuresis and thus provide ample water for the kidneys to carry any katabolites. If renal output falls, fluid input must be accordingly adjusted to prevent hydræmia. Excretion of 1,500 c.c. of urine daily allows the kidney to excrete accumulated waste material without having to work to maximum capacity. If anoxia and air hunger are acute, oxygen may be given with a B.L.B. mask. As soon as hæmolysis starts, the patient's blood group is determined and the progress of the anæmia determined by red cell counts, hæmoglobin estimations and hæmatocrit readings, at 8 a.m., noon and 7 p.m. In the jungle a simple hæmoglobinometer should be used if more elaborate methods are not available.

The greatest care must be exercised in matching donor and recipient. If possible, cross matching should be done in a water bath at 37° F. to ensure absence of cold agglutinins. The drip should not be started until at least 10 c.c. of the donor's blood has been slowly injected intravenously to see whether any immediate reactions are going to take place. The drip rate should be as slow as possible and the blood flask kept warm by hot water bottles while the transfusion is in progress. One drop every six seconds is an average figure. In remote areas, where facilities for transfusion are non-existent, the necessary apparatus and refrigerated universal donor's blood in specially insulated thermos flasks could be dropped by parachute.

*Malaria and Blood Transfusion.*—In tropical zones, where malaria is endemic, the transfusion officer's lot is not a happy one. One must assume that all donors both black and white are infected with the malaria germ. Even if there is no previous history of an attack of fever in the donor it is advisable to give a full course of anti-malarial treatment to the recipient. Many Europeans do not develop malaria until they return to the cooler climate of their homeland. The filtration of plasma through Seitz filters may render it parasite-free

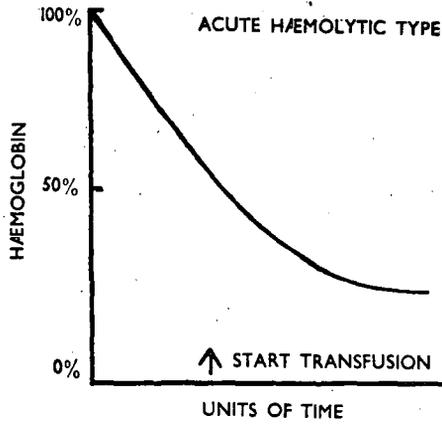


FIG. 1.

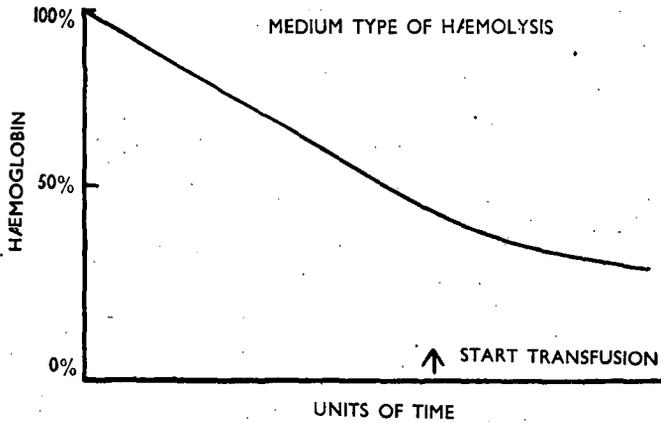


FIG. 2.

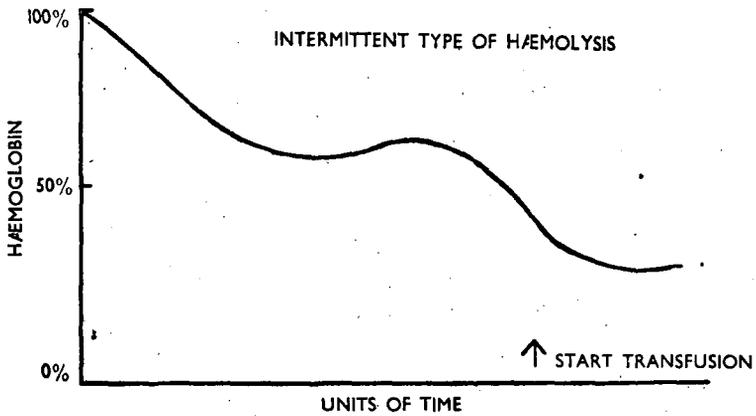


FIG. 3.

but does not remove the malarial toxins. I tried storing malarious blood to which quinine had been added in high concentration but even at the end of four or five days parasites were found in smears taken from the bottles. Air services may in future permit weekly stores of blood to be sent to such areas from healthy donors.

Infusion fluids tend to keep badly in the tropics even when refrigerators are available. Dried plasma and serum are invaluable. Infusion fluids should be made up as required and used at once. All rubber and glass tubing should be stored in airtight bottles and heat sterilized immediately before use. Moulds and fungi soon grow in damp apparatus. After use, all the apparatus should be thoroughly cleaned, slowly dry heated and then stored in the airtight bottles.

*Acute Bacillary Dysentery.*—Altogether we treated 360 cases of bacillary dysentery, 304 of these being in native troops. There were no deaths amongst the white patients and three amongst the natives. The majority was due to the Flexner group of organisms and was clinically mild to moderate in severity. We confirmed the published work of others in the Middle East as to the value of the sulphonamides in treating this disease. Our results are unstatistical on account of the difficulty in obtaining selective culture media.

Sulphonamide dosage was adjusted in accordance with the degree of diarrhoea and the rate of fluid lost from the bowel. The aim is to maintain a therapeutic concentration of the drug in the bowel for at least four days. I prefer to give sulphaguanidine for the first two days and then to switch over to sulphasuxadine. The higher solubility of sulphaguanidine makes it more effective when the diarrhoea is intense whereas the less soluble sulphasuxadine is more likely to be swept out of the intestinal canal before being able to exert its effects. If the diarrhoea is not intense sulphasuxadine is the better drug. Dosage can be adjusted in accordance with the fluid volume of the stool (*see* Table II).

TABLE II.

Day	Fluid Volume of Stools in c.c. per 24 hours	Drug	Dose in grams	
			Daily	Total
1st	1,000	Sulphaguanidine	36	36
2nd	600	"	24	60
3rd	400	Sulphasuxadine	12	72
4th	200	"	9	81
5th	50	"	6	87

Initial purgation is contraindicated as quicker control and lower dosage of sulphonamide can be obtained if the peristaltic action of the bowel is reduced by opiates during the first forty-eight hours. The water balance must be carefully watched and adjusted.

*Amœbic Dysentery.*—The diagnosis can only be clinched by a microscopical examination. To aid microscopical identification, the stools should be rendered semifluid by means of saline purges and then sent "piping hot" to the laboratory. Good lenses and a warm stage are often as essential as adequate experience. Clinicians should study amœbæ themselves and not leave it entirely to the pathologist who may be replaced at a future date by an inexperienced newcomer.

We treated 374 cases of which 62 were Europeans. There were no deaths amongst the Europeans and three amongst the natives. Two of the 62 European patients became chronic, and were invalided to the U.K. Our assessment of cure was that 6 successive stools should be free of *Entamœba histolytica*. About 30 per cent of the native troops were carriers of *E. histolytica*.

The good results obtained in treating the Europeans may be attributed to three main factors: (1) The patients were mostly young healthy adults who had not been in the tropics for more than two years; (2) the patients were treated early in the disease before extensive lesions had developed in the intestines; (3) a combined course of treatment was given to all patients. The routine treatment was as follows: Emetine hydrochloride 1 grain was given daily by the intramuscular route for the first ten days, supplemented by one capsule of

Amebvan (Evans Biological Institute) morning and evening. A full diet was allowed during this time but, for the second part of the treatment, the patients were put on a low residue diet. On concluding the injections, a welcome forty-eight hours rest period was allowed before the second part of the treatment was started. This has been described by Sir Philip Manson-Bahr in his textbook of Tropical Medicine and consists of a ten-day course of oral emetine bismuth iodide and 2½ per cent yatra retention enemas. The stools should be sieved during the E.B.I. treatment to ensure that the capsules are not being passed undissolved in the stools. One month after discharge the patients were readmitted and a further four stools examined as a precaution against relapse. Sigmoidoscopy of the two chronic cases showed no ulcerative lesions in the part of the bowel examined so that it is likely that these patients had become carriers without extensive bowel lesions. One of them cleared up rapidly on a further course of E.B.I. on his return to England.

From personal experience I know that this is a gruelling treatment but, remembering the chronic ill-health that can result from inadequately treated cases, I think our results fully justified it. We found that several patients had incompletely healed ulcers and positive stools on the completion of the first part of the treatment. We tried giving sulphapyridine to a few cases but were not impressed with the results.

*Jaundice.*—Like many cases of European jaundice, the aetiology of jaundice in West Africa may be shrouded in obscurity. Some of these patients did not fit in with the classical picture of epidemic jaundice and had proteinuria with epithelial casts in the urine. They may have been cases of modified yellow fever occurring in patients inoculated with Y.F. vaccine. There is good scope for liver puncture studies in these cases. I treated three cases of yellow fever in Europeans in another military hospital. They had received their "pre-ventive" Y.F. inoculations within a period not exceeding two years. The infections were very severe and two of the patients died.

One patient with infective mononucleosis became deeply jaundiced for over two weeks and had a very severe illness.

*Medical Out-patients Department.*—Here the neurotic loomed largely and ominously. In the tropics one must be very careful to distinguish organic from functional disease. Vitality and the healthy outlook on life are gradually worn down by heat, dampness, the seemingly endless rainy season, boredom, lack of a social life and the severance of home contacts. Exhaustion and anxiety-states formed the majority of the cases. As far as I could determine, these patients made a good recovery on their return home. Borderline cases of neurosis should be sent home and should not be sent back for a further tour of duty as they invariably break down and may become chronic. In peace time, the outlook is entirely different as most of the troops have volunteered for service in this part of the world and are seasoned in the ways of tropical life.

Patients with symptoms of melancholia should receive very careful consideration as suicide may be attempted if they are left to grapple with their difficulties for too long a period. Such cases should be invalidated home at the earliest opportunity. No patient should be labelled psychoneurotic until chronic malaria and amoebiasis have been ruled out by clinical and laboratory investigations. This also applies to venereal disease, sleepy sickness and intestinal helminths. If possible, cases of neurosis should not be admitted for investigation as they are often a source of the wrong kind of medical propaganda for the other patients in the wards. Sternal puncture is probably the best way of detecting latent malaria.

*Skin Diseases.*—Fungus and coccogenic skin infections are the cause of an enormous amount of loss in working hours amongst both white and native troops. High temperature and humidity levels all the year round (approx. 90° F. and 90 per cent) produce a sodden epidermis which forms a beautiful culture medium for bacteria and fungi. Daily baths, with careful drying of the skin folds and interdigital clefts, followed by the application of a mild antiseptic powder, are useful prophylactics. Skin areas pressed on by equipment and heavy clothing should receive special attention. Most of the lesions are secondarily infected. After numerous trials I hit on the following routine treatment for coccogenic and fungus skin

infections. The first thing is to seal off the affected skin from the air and thus prevent exogenous reinfection. To do this, a triple dye solution of the following composition is painted on to the affected areas three times a day.

Methylene blue ..	1/400	—
Gentian violet ..	1/400	aa
Acriflavine ..	1/1,000	equal parts

When each application has dried a film of Tannafax jelly is applied. The treatment is continued until a good protective crust has formed. If possible the lesions should be left exposed to the air, otherwise sterile dressings should protect the crusts. The infection is also tackled from within by means of sulphathiazole given as three tablets t.i.d. for six days. A mixed and fully vitaminized diet is helpful in preventing these infections getting a good hold.

*Analysis of Deaths in White Service Personnel.*—There were eight deaths due to medical causes for the period under review. These are shown in Table III.

TABLE III.

Disease	Cases	Died
Cerebral malaria .. .. .	6	4
Blackwater fever .. .. .	8	2
Acute medullary encephalitis (unknown aetiology) ..	1	1
Chronic ulcerative colitis-perforation-peritonitis ..	1	1

*Causes of Invalidism amongst White Service Personnel.*—This means invaliding back to the U.K. and not necessarily out of the Service. The ten principal causes are shown in Table IV. Out of this total of 99 cases, 69 or 69.7 per cent were medical cases.

TABLE IV.—INVALIDED HOME

Disease	Cases	Disease	Cases
Chronic malaria .. .. .	21	Organic nervous disease .. .. .	7
Psychoneurosis .. .. .	17	Chronic bronchitis .. .. .	6
Orthopaedic .. .. .	15	E.N.T. diseases .. .. .	5
Malaria with other medical conditions ..	10	Phthisis .. .. .	4
Eye diseases .. .. .	10	Peptic ulcer .. .. .	4

SECTION 2.—NATIVE SERVICE PERSONNEL.

Total in-patients numbered 7,920 for the period of review. The twenty-four principal diseases responsible for the 6,140 medical cases admitted formed 77.5 per cent of the total native admission rate.

Before embarking on any individual discussion of these various ailments it is worth while considering the average native patient from the West African colonies. The student of tropical medicine soon learns that not only is the native subjected to an enormous amount of endemic disease but that his flesh and blood are defensively weak against many of these diseases. The bodily substance, of poorer quality than that of the average European, may be the outcome of centuries of inbreeding, poverty, starvation and improper or absent hygiene and sanitation. Malaria, hookworm, yaws and amoebic dysentery are constantly sapping his bodily reserves of defence against the innumerable foes of nature which surround him. It is rare to find a native patient suffering from only one disease. A patient is brought in with a fractured femur. Examination will show that he may have chronic malaria, hookworm anaemia and a colon ravaged by the feasting of *E. histolytica* over many months or even years. It is no wonder that his fracture may heal slowly or union be of poor consistency. We would not accept such a standard of health normality for the cattle in Great Britain. The New York negro escapes most of the diseases which afflict his jungle brethren because he is forced to live under good hygienic conditions and to eat a better balanced diet.

*Tropical Ulcers.*—To my mind a tropical ulcer is like a hole in a rotten pear. The surface of the pear breaks down because the underlying flesh of the pear is rotten. For this reason, the treatment of these ulcers is not a purely surgical matter. No one has ever discovered a specific

ætiological agent nor are they likely to until all the destructive forces to which native flesh is subject have been removed. In other words, it is a question of prevention being better than any cure. The white man who has lived for years in this part of the world never gets a tropical ulcer nor do the inmates of Harlem. A good vitaminized diet and the elimination of associated diseases are every bit as important in treatment as are plaster of Paris, chemotherapy, skin grafting and Elastoplast.

*Pneumonia.*—There were 291 cases with six deaths. These figures pay testimony to the great effectiveness of the sulphonamides. After forty-eight hours treatment it was not unusual to find the patients hopping around the wards with consolidated lobes as happy as sand boys. A small number of the patients did not respond to sulphonamide therapy and were probably cases of atypical pneumonia. Most of these were pyrexial for three or four weeks and had no leucocytosis. Even when the temperature had reached normal levels there was a tendency for fluffy areas to persist in the X-ray pictures for many weeks after but eventual recovery was complete.

The only complications met with in the coccogenic pneumonias were two cases of empyema. One of these rapidly cleared up after 6 grams of sulphapyridine had been injected into the pleural cavity on two occasions at an interval of three days. I would like to re-emphasize the importance of giving the sulphonamides in high dosage during the first two or three days of treatment. At least 6 grams daily should be given for the first seventy-two hours, the tablets to be given four-hourly throughout the day and night. This will prevent the organisms becoming drug fast, a serious complication.

*Dracontiasis.*—Guinea-worms were only met with amongst the troops from Nigeria. They were a source of much invalidism and disability. The author has described, in a separate paper, the good results obtained by treating these cases by means of parenteral injections of Phenothiazine. (*Trans. Roy. Soc. Trop. Med. and Hygiene*, vol. xxxv, No. 6, pp. 291-301.)

*Bilharziasis.*—109 cases were admitted. The majority were cases of *S. haematobium* infection producing endemic hæmaturia but a few cases of dysentery due to *S. mansoni* infection were encountered. Some patients had *S. mansoni* in the stools without appearing to suffer any adverse results.

*Yaws.*—Some native patients had strongly positive Kahn reactions. The assumption that all these patients may be suffering from yaws or syphilis is usually correct but it should be remembered that other diseases such as active malaria may give a temporarily positive reaction. If one cannot obtain an accurate history it may be a little difficult to distinguish latent yaws from latent syphilis. In such cases the therapeutic test of treatment will have to be carried out. If the patient is suffering from yaws the serum titre will fall rapidly after a few injections of arsenic and bismuth. The common yaws lesions we came across were frambœsiform skin lesions, dermatitic patches suggestive of dermal leprosy or ringworm, juxtaarticular nodules, vitiligenous patches marking the sites of old healed ulcers and ganglia of the wrist. Hard painful masses suggestive of deep muscle abscesses were often found to be due to yaws. Some of them were excised in the belief that they were inflammatory *Onchocercus volvulus* nodules. Two interesting cases of polycystic bone disease with positive Kahns were treated. Cysts were present in the long bones, the ribs and the skull. These corresponded to similar cases described amongst the aboriginal tribes of Northern Australia.

*Deficiency Diseases.*—Many patients were in a state of latent hypovitaminosis. Xerophthalmia, perleche, glossitis, gingivitis, and pellagroid skin states were common enough. A few cases of beri-beri, some with cardiac lesions, were treated and cases of peripheral neuritis without anæmia were seen. The addition of vegetables and Marmite to the simple diet of rice and palm oil produced improvement but severe cases required the addition of specific vitamin concentrates.

*Cerebrospinal Fever.*—This proved to be the cause of the highest death-rate amongst the native patients. There were 47 cases with 6 deaths, a mortality of 12·8 per cent. Some of the infections were of a fulminating character and of very sudden onset. It was not unusual for cases to be picked up unconscious on the road or in barracks. Some of these acute cases had no neck rigidity and the diagnosis had to be made by an examination of the C.S.F. The

failure of chemotherapy to save some of these patients was due to a coincidental encephalitis. No cases of the Waterhouse-Friedreichson syndrome were seen.

*Ju Ju.*—Native troops would arrive at the out-patient's department with aphasia, deafness, blindness or paralysis. Around their wrists one might observe bands of woven grass, protective emblems against further assaults by the evil spirits. This is the primitive man's way of exhibiting neurosis, hysteria or plain malingering. Many believe themselves to be genuinely bewitched by an evil spirit. To deal with such cases, the physician must turn witch doctor and for the moment ignore the perils that the Hippocratican oath holds in store for all who practise magic and quackery. To use verbal persuasion is a waste of time even if one did understand the lingo. In cases of malingering, the stoppage of pay and food will often cause the blind to see and the lame to walk. This crude and harsh treatment is founded on the simple philosophy that, if you cannot see or walk to your pay or food, it can be of no use to you. Such simplicity appeals to the native mind. Usually about the second day of the treatment, on inquiring of the patient how he feels, the answer is—"me see or walk small small better sah." In another twenty-four hours the cure is complete.

If malingering is not the cause of the trouble, more powerful magic must be produced. Insulin is powerful magic in that it can produce hypoglycæmic convulsions. Here your argument is that you can shake out the evil spirit by your own powerful *ju ju*. Such magic will shake the "divil" out of most natives. The convulsions are the manifestations of the inward struggles of the good and the evil spirits. This was the only way I was able to cure one patient who was functionally both deaf and dumb. We never had to call in a witch doctor for a consultation!

*Analysis of Deaths in Native Persons.*

There were 55 deaths amongst the 7,920 in-patients. There were 25 deaths amongst the 6,140 medical cases. An analysis of these deaths is shown in Table V.

TABLE V.

<i>Disease</i>	<i>Cases</i>	<i>Deaths</i>
Acute infective meningitis .. .. .	50	7
Acute infective pneumonia .. .. .	291	6
Pulmonary tuberculosis .. .. .	34	5
Bacillary dysentery .. .. .	304	3
Amœbic dysentery .. .. .	312	3
Paratyphoid B septicæmia .. .. .	1	1

CAUSES OF INVALIDISM (BOARDING BACK TO HOME COUNTRY) OF  
NATIVE SERVICE PERSONNEL.

The six main causes are shown in Table VI.

TABLE VI.

<i>Disease</i>	<i>Cases</i>
Pulmonary Tuberculosis .. .. .	10
Mental diseases .. .. .	6
Eye diseases .. .. .	4
Leprosy .. .. .	4
Chronic septic lesions .. .. .	3
Filariasis .. .. .	3

SUMMARY.

A brief account of the kind of work one has to do in a mixed West African Military Hospital of 600 beds is given. The work is of an extremely varied nature. Malaria is still the main cause of illness amongst European troops. Cerebral malaria may be a more dangerous complication of malaria than is blackwater fever. Some points in connexion with the treatment of blackwater fever and the dysenteries are mentioned.

The high incidence of disease amongst natives will be maintained so long as their living conditions are kept at such a low level. Army life has given many native soldiers improved living conditions to the betterment of their health and physique. Preventative medicine offers great scope for improvement in the health of our native African troops.

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