**AFRICAN HÆMOGLOBINURIC FEVER, COMMONLY
CALLED BLACKWATER FEVER.**

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TYPES OF THE DISEASE.

HÆMOGLOBINURIC fever is a disease of Europeans resident in Western Equatorial Africa, and is an acute specific fever, characterised by rapid jaundice, hæmoglobinuria, and frequently suppression of urine. Three varieties exist—the sthenic, the insidious, and the pernicious. In the first, from which recovery is common, the attack is sudden, the fever is high at the beginning, and the urine is copious. In the second the attack is insidious, as in a case of remittent fever, but hæmoglobinuria and jaundice intervene and early suppression of urine occurs. In the third the onset is sudden, the temperature quickly rises high and quickly falls, jaundice appears at once, and suppression of urine occurs within twenty-four hours. Recovery is not to be expected in the insidious and pernicious varieties. This disease is to be found amongst Europeans resident in Western Equatorial Africa from the Senegal to Loanda, and in Madagascar. The cases which are reported from Mauritius, Java, and Hong Kong are unlikely to be fever of the African type.

MORBID ANATOMY.

The *post-mortem* appearance is somewhat different in the three varieties but the condition of the kidneys is the same. In the sthenic variety the jaundice is slight and confined mainly to the face; but in other cases, though it fades before death, it again deepens, and is of an intense saffron-mustard colour. The body is generally emaciated, the face, upper and lower extremities, exhibiting marked wasting. On section, the icteric hue is found to penetrate through the entire skin, but not to extend to the deeper tissues—as the muscles, connective tissues, and nerves. Plehn, who saw the disease in Cameroon, describes the muscular tissue as stained yellow. This discoloration is due to altered blood pigment. The adipose tissue is generally diminished.

The brain and membranes are not stained, but are generally in a condition of extreme anaemia, and the lateral ventricles contain an unusual quantity of fluid, most marked in a case of the sthenic variety.

The lungs are extremely pale and light-ashen in colour, very little congestion being visible even in their posterior bases. On section, only a very light-red mucus and serous frothy liquid appears.

The heart is usually of a pale-grey colour, and the muscular fibres are easily separated. The walls of the ventricles, even of the left, are exceedingly fine and thin. Frothy light-red blood is met with in the right auricle and ventricle, but the left side of the heart is empty and in a state of collapse rather than of contraction.

The liver exhibits very remarkable changes; in the sthenic variety, as death usually occurs early, before extensive alterations have had time to become manifest, the colour is a light drab, a pale ochre, or a deep fawn. The capsule is loosely adherent. On section, a light-red frothy blood flows. In the other varieties the liver is of a deep saffron colour, with numerous nodules of a more intensely bright yellow under a loosely-adherent capsule. These nodules differ in size from that of a pin's head to that of buckshot, and on section are found to be cysts containing a thick, liquid, cheesy matter, bright yellow in colour. The liver, in fact, looks like an immense golden lemon, and the characteristic colour pervades its entire substance. No blood issues on section, and the cut ducts and vessels gape widely. The gall bladder is generally full, and its contents dark green. Microscopically, the liver cells seem to have disappeared, and to have left merely open spaces, empty, or partially filled with an amorphous material. The smaller ducts are tortuous or obliterated. There may be a small amount of blood in the portal vein, but the inferior vena cava is generally filled with a light-red frothy liquid, without clots.

The kidneys are enlarged and generally weigh over 8 ounces, and present an appearance resembling that seen in acute desquamative nephritis. The cortical portion is red, the renal

substance is readily friable, and the capsule loose. The infundibula appear swollen, and the pelvis contains a dark slimy fluid. Though the kidneys are rather friable, microscopic examination reveals little beyond petechiæ and a swollen and disorganised condition of the uriniferous tubules, with occasional masses of hæmoglobin blocking up the lumen.

The spleen is enlarged and friable, and weighs from 14 to 16 ounces. The capsule peels off like the finger of a glove, and a red, frothy, blood-like fluid exudes on section. There are scattered dark patches of hæmorrhage in the substance of the spleen, and masses of hæmoglobin appear with broken-down pulp tissue under the microscope.

The stomach is distended and generally inflamed in certain areas, most frequently along the inner surface of the greater curvature. Masses like lumps of black currant jelly are to be found in the stomach in the pernicious variety.

The small intestines show scattered patches of congestion, except at the entrance of the common bile duct, where there is intense yellow staining. Internally they are lined with muco-gelatinous material, varying in colour from light green to deep black; the valvulæ conniventes and even the mucous membrane in bad cases seem worn away.

The large intestine appears congested, and through the entire rectum breaches of surfaces, petechiæ, and areas of torn membrane are apparent.

The pancreas seems normal, as is also the bladder, which is usually empty. In some cases a few drops of bloody or pale yellow urine, neutral or alkaline in reaction, are to be found.

THE STHENIC TYPE.

In a typical case of hæmoglobinuric fever of the sthenic variety, which is popularly known as "blackwater fever," the invasion is sudden, but preceded by one or two days of a general feeling of indisposition, nausea, and anorexia. A sensation of general languor and lassitude exists, unfitting the patient for any exertion, and though vague feverishness is felt, a rigor or chill is rare. The actual attack is introduced with a flush of burning heat through the body, agonising pains in the back and loins, shooting down through the lower limbs, intense frontal headache, an unquenchable thirst, bilious vomiting, tenesmus, and a desire to void urine and go to stool. A rise of temperature to 103.5°, 104°, or 105° quickly ensues; the pulse is found to be weak, small, and rapid, generally over 120; the tongue becomes covered with a thick yellow fur; the respiration is hurried, loudly nasal, and made with effort; the skin is dry and hot, the forehead feeling particularly so; the conjunctivæ are injected and the pupils extremely contracted.

When urine is passed it is seen to be of the colour of stout, with a red-tinged froth. It is acid in reaction, and microscopically large numbers of red blood corpuscles are present, some unchanged, but the majority with frayed margins, and with the hæmoglobin escaping. Masses of hæmoglobin abound. The alvine evacuations are in the initial stage copious, dark yellow or black and tarry, and of an intensely foul and penetrating odour.

After a period varying from twelve to twenty-four hours a stage of remission is entered, though generally not without treatment. A profuse perspiration gradually steals over the whole body, the headache becomes less, and the other symptoms enumerated above become alleviated, except vomiting and painful retching, which are always difficult to check. The temperature tends to fall two or three degrees, and the pulse-rate becomes diminished. Prostration and vertigo become pronounced, and insomnia is constant. The urine is still of the same character as at first, and diarrhoea may continue. This stage usually endures for twelve or eighteen hours, and in a favourable case is succeeded by a stage of lysis or decline, which is gradual and slow. The temperature falls a little little daily, the pulse grows firmer, and the urine begins to change colour after the third day, proceeding through alterations from black to light red and deep yellow.

Convalescence begins about the sixth day from the commencement of the attack, and is generally prolonged and tedious. Indications of intense prostration and anaemia are present, and frequently a livid pallor or a light jaundice appears. A deposit continues in the urine on standing, and enlargement of the spleen becomes very manifest. Insomnia and inability to obtain repose often occasion much trouble,

and health is rarely re-established without a change of climate.

All cases do not, however, terminate in this manner. The stage of remission is often followed by a fresh access of fever, and the urine continues dark in colour, and generally diminished in quantity. Perspiration is absent, and difficult to produce, and hyperpyrexia is a pressing and dangerous sign. Early delirium and a tendency to coma are always present in fatal cases. The ordinary symptoms of an acute malarial fever are of exceeding intensity, and almost impossible to alleviate. Should suppression of urine complicate the disease, the symptoms of acute uræmia speedily arise, and coma and hyperpyrexia intervene. Death occurs usually after the fifth day, though many cases terminate fatally as early as the third, and is preceded by uræmic convulsions.

THE INSIDIOUS TYPE.

This form begins like an attack of ordinary remittent fever of a low type, and generally occurs in subjects weakened by exposure, bad food, and long residence in the West African climate. The temperature rarely rises above 102° F., and the pulse is not rapid, though weak. But there is an ashy pallor on the face, the tongue is large and flabby, the appetite is lost, and the bowels are intensely confined. A feeling of unrested fatigue is very constant. Antipyretics act with ease, and the skin is found cool and moist. After the first remission suspicious signs are to be noted. The temperature rises and remains unchanging, the eyeballs feel dry and tense, œdema of the eyelids gradually appears, the pupils become contracted, and the pulse is small and wiry. The skin is dry and wrinkled, and perspiration generally absent. Headache is present in every case, and a feeling of intense languor throughout the frame. An unfailing sign of approaching trouble is the scantiness of the urine.

The stage of jaundice is reached about the third day. Headache becomes intense, thirst increases, painful bilious vomiting gives much distress, the bowels are obstinately confined, and the urine becomes absolutely black, though with a red tinge, and the quantity is decreased. Icterus gradually appears over the entire body and limbs, at first merely a dull metallic bluish tint being remarked in the face, succeeded by a greyish-yellow, and finally by a mustard-yellow hue. In a short period, varying from three to eight hours, complete jaundice is established. It is not as a rule very noticeable to the patient. The skin may feel a little cool and moist, and the temperature rarely exceeds 101° F.

A stage of collapse soon follows. The icterus deepens, the urine becomes suppressed, the stools contain no fæculent matter, twitching of the facial muscles begins, and a distressing hiccough which it is almost impossible to palliate shakes the body of the patient, and renders swallowing difficult. The temperature falls, and the pulse becomes almost imperceptible. The skin still may feel a little cool, but not moist, presenting a wrinkled or glazed appearance. The tongue is dry and cracked, brown or black, and the lips and teeth are covered with sordes. The pharynx and larynx soon become involved. The throat is sore and the voice husky. Thirst tortures the patient, and owing to the vomiting and hiccough cannot be slaked. Insomnia remains persistent, but a semi-comatose state is common.

After a period of forty-eight to seventy-two hours the temperature becomes normal, the pulse disappears, coma advances, and death occurs after some slight convulsions, the body and extremities being cold for some hours before death. It frequently happens that during the last twelve hours the patient at times seems dead, but slowly revives. Temperature falls to 97° F.

THE PERNICIOUS TYPE.

In this form of hæmoglobinuric fever there are usually premonitory symptoms, a feeling of general *malaise*, languor, loss of appetite, epigastric depression, and constipation. A slight rise in temperature may be noticed, and pain in the hepatic area is constant. These symptoms may last for two or three days. The invasion is sudden, and is marked by a flush of ardent heat passing over the body, accompanied by agonising abdominal pains and vomiting, and a desire to go to stool. A prolonged rigor soon seizes the patient, and a sensation of dyspnoea, amounting to intense oppression and to a fear of suffocation occurs. Headache—which has been

described as a feeling as if an iron clamp were tightened around the skull, and as if a nail were driven into the brain—is early present; and excruciating pains shoot down through the spinal column, through the loins and lower limbs. The tongue is covered with a thick creamy fur, but there is generally no peculiar odour from the breath. Tenderness exists in the right hypochondrial region, and dulness is increased, extending for about half an inch below the normal limit. The stools are yellowish brown in colour, containing some mucus and much undigested food. The urine voided is absolutely black, the colour of stout.

The temperature rises to 103° F., and the pulse is rapid and full, reaching to 120 or 132. Two or more severe rigors occur, and within about three hours from the beginning of the actual attack a jaundiced hue appears. It is at first slight, but is rapidly deepened and intensified; in less than a quarter of an hour a complete alteration to a full yellow colour is produced. The colour extends uniformly over the entire trunk and limbs, into the conjunctivæ, under the nails, and over the scalp under the hair. The lips become stained, but the tongue escapes, and the ears are brilliantly saffron over the whole helix and concha. Insomnia and extreme restlessness weary the spirit, and a feeling of terror occupies the mind.

The stage of suppression of urine is entered after a period varying from twelve to twenty-four hours. The general condition appears somewhat improved, the temperature falls considerably, to 100° or 101° F., the pulse becomes calm, and the respiration almost normal. The skin grows cool, but dry and tense, and perspiration is absent. A mental rally is experienced as the severity of the symptoms abates, but vomiting still continues, and the stools are numerous and of an excessively foul odour; this odour soon ceases, and the colour becomes a dark green. Urine is completely suppressed, and the catheter will draw only a few drops of blackish mucus, alkaline in reaction. The nervous symptoms are slightly alleviated, but insomnia remains.

Rigors of great severity occur and elevations of temperature to 104° or 105° after a few hours, which are not, however, of long duration. The skin assumes a colour more intensely yellow, if possible, than at first, becoming of a mustard hue, the lips are baked and bluish, thirst grows insatiable, and a hiccough begins. The stools are usually not fæculent and generally green. A mental confusion without actual delirium is common. As the disease progresses the temperature tends to fall to normal, whilst the pulse-rate remains generally above 100 and out of proportion to the temperature. Hæmatemesis is frequently copious, but the characteristic black vomit of yellow fever is absent, though a vomit of clots, mucus, and membrane-like shreds occurs. Intense adynamia is manifested, and the heart sounds grow feeble, an anæmic murmur being occasionally audible.

If convulsions or coma have not cut short the illness, an algid stage or stage of collapse is entered about the third or fourth day, if life is prolonged so far. The temperature becomes subnormal, whilst the pulse remains above normal, varying from 96 to 112, and the respiration is quickened, varying from 36 to 48 at the end of the disease. The sensation of weakness is appalling, pains shoot through the chest and abdomen, and muscular twitchings and cramps seize the limbs, and insomnia hardly yields to any treatment. The extremities become cold, and the yellow colour fades to some extent from the conjunctivæ, ears, hands, and feet. Papules may appear scattered over the face and body with solid caseous contents, and a petechial rash is visible. The tongue and lips are black, vomiting continues, and hæmorrhage from the gums, mouth, and back of the throat breaks forth in addition to the hæmatemesis. The end is reached from syncope after a short period of delirium or transient convulsions.

The following cases are selected to illustrate the three varieties of hæmoglobinuric fever above described:

CASE I. STHENIC TYPE.

W. M., in the P.W.D. of the Gold Coast, had been for some months much exposed to malaria and sun, and had been working during January, 1895, in swampy ground along the river Pra, and dwelling in insanitary native houses.

January 21st. About noon he was attacked by great pain in the back and loins and through the lower limbs and by intense frontal headache. He complained of a parching thirst, vomited bile constantly, and was seized with colicky pains in the abdomen, producing a desire to go to stool. He

was breathing hurriedly, his tongue was covered with a thick yellow fur, the skin was dry and hot, the conjunctivæ injected, the pulse was weak, small and rapid—132.

At 5.30 P.M. he passed a large quantity of urine, nearly the colour of stout, frothy, and with a red tinge; and vomiting continued to be very troublesome. Frequent dark-coloured stools of a very foul odour were passed.

February 1st. At 7 A.M. the pulse was 108, and the urine of the same character as on the previous day, and evacuations rather copious and foul; weakness, vertigo, and retching complained of.

February 2nd. The pulse was 100. The patient had slept well, but felt extremely weak and consumed by a burning thirst. The urine continued to be of the same character as before.

February 3rd. The patient had slept well, the hypnotic on this occasion being sulphonal, and felt refreshed, though weak. The colour of the urine began to change, and varied during the day from a light red to a deep yellow. Bovril, corn flour, and soda and milk were added.

After this date the patient continued to improve. On February 9th the temperature remained at 99°, the urine was clear without a deposit, and on February 11th he proceeded to Grand Canary, to try a sea voyage for the anæmia remaining.

CASE II. INSIDIOUS TYPE.

G. B., French Roman Catholic Missionary, 30 years of age, had been for three years on the Gold Coast without a change, and in September, 1892, had been treated by me with arsenic for anæmia and malarial oedema

from which he recovered. On March 10th, having returned to Elmina the previous day, he felt unwell, fatigued, inclined to vomit, and absolutely without appetite. Pulse 96, and labouring. The bowels were confined, the tongue was large and flabby, and, though no actual pains shot through the body, a feeling of intense weariness and epigastric depression possessed him. The skin was cool and moist. Sulphate of magnesium was given and vomited, but was retained when repeated.

After a motion, 20 gr. of antipyrin were given and as soon as perspiration occurred, quinine was administered. He was allowed bouillon freely, diluent drinks, and stimulants, and his condition improved towards evening.

March 11th. He felt worse. His face was of an unusual pallor, and a headache commenced. In the evening the pulse was 96, small and wiry; and a slight oedema of the eyelids was apparent.

March 12th. He had had a bad night, passed urine perfectly black in colour, and began to change colour. At 8 A.M. he was quite yellow, but the skin was cool. After this hour he passed only three ounces of black urine.

On March 13th distressing hiccough began, which nothing could alleviate, and on March 14th the patient was semi-comatose and remained in this condition all day. Even iced drinks could not be swallowed owing to the hiccough. The pulse in the evening was 80.

March 15th. After some convulsions the patient died at 4 A.M., the colour of the skin being then an intensely brilliant saffron hue. The temperature was 97°, and for some hours before death the pulse was imperceptible and the body and extremities quite cold.

CASE III. PERNICIOUS TYPE.

D. E., aged 29, a District Commissioner, who stated that on January 16th he felt free from any feeling of "seediness," and went about his work as usual, was on January 17th, after the usual midday meal, reclining, and was suddenly seized with piercing pains in the stomach and abdomen. He began to vomit, and had a prolonged rigor. He was obliged to go to stool, and noticed his urine was turned porter-coloured, a fact that alarmed him greatly. Flushes of heat then passed over his body, and pains shot through his head from forehead to occiput, through his back, loins, and lower limbs. About 4 P.M. his skin began to change colour, and in less than a quarter of an hour a complete alteration to intense yellow was produced. Within the next eight hours three severe prolonged rigors occurred, during which he suffered from a sensation of suffocation. That afternoon the temperature was 105° F., and the pulse rapid and strong. The urine voided, at first about 12 ounces, was porter-coloured, but with a faint red tinge, and contained masses of hæmoglobin, grouped together, singly and with torn red corpuscles. The reaction was acid.

On January 18th the pulse was 96, and the respirations 28. He had had a bad night, slept little, was extremely restless, and in a state of terror. He had been to stool twenty times, and the evacuations were yellowish-brown in colour and intensely foul smelling. He passed about 10 ounces of porter-coloured urine during the night and early morning, but after 8 A.M. urine was suppressed. At 6 P.M. the pulse was 88.

January 19th. There was no sleep during the night and no urine was passed. The icterus was, if possible, more intense than at first, but the patient attributed the discoloration of his hands to the blankets which covered him, and which were red and white. In the evening the pulse was 104. Large doses of the bromides were given with chloral.

On January 20th the pulse was 124. Sleep was broken by a rigor of great severity occurring at 4 A.M., during which the temperature rose to 104°, falling gradually with the administration of antifebrin and warm drinks. Sulphonal produced about four hours' sleep during the day.

On January 21st the pulse was 92. His condition was unchanged, though a fairly good night had been passed. Hiccough was very troublesome; ice failed in its effect, and hæmatemesis occurred. The pulse in the evening was 104.

On January 22nd the pulse was 84. He had had a bad night, sleep disturbed by hiccough, and great weakness present. The lips and tongue were brown and thirst insatiable; the heart sounds were extremely feeble. Intense prostration, restlessness, and insomnia were present, and feelings of constriction around the chest were complained of, which friction with brandy dissipated. In the evening the pulse was 84. Next morning the pulse was 92. He had had no sleep during the night, hiccough being continuous and weakness appalling; hæmatemesis also occurred. The colour of the skin seemed to become a lighter yellow, and to fade slightly from the conjunctivæ. The pulse in the evening was 96. Sulphonal as well as bromides were given without result.

On January 24th the pulse was 108. The body was very cold and difficult to warm. Hiccough was extremely troublesome and tongue and lips were black. A hæmorrhage burst from the mouth, and about 4 drachms of acid albuminous urine were passed voluntarily. Stimulants were taken every quarter of an hour, and consciousness remained up to five minutes before death, which occurred at 5 P.M. At 4 P.M. the temperature was 98.5°, pulse 104, and respirations 48.

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REMARKS ON YELLOW FEVER IN JAMAICA.

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RECENT HISTORY OF YELLOW FEVER IN JAMAICA.

FOR some time past yellow fever has been rare and almost unknown in Jamaica. I have often been asked by recent arrivals how it was that no one heard anything about a disease that used to be so common and fatal in Jamaica. I have never been able to give a satisfactory answer to the question. Even sporadic cases appeared to be things of the past, and there was a growing confidence that the dread disease had died out. Unfortunately the late outbreak indicates that, whatever may have been the cause of the happy lull, yellow fever is still a Jamaican disease, and only wants something to start it, and pabulum to keep it going. It may be that the recent outbreak was determined by the periodicity which is supposed by some to regulate epidemics, acting at a time when sanitary matters were not as they should have been. As soon as the disease showed itself in Kingston there were many and various speculations as to the cause. Dr. Anderson, late of Jamaica, in his useful little book just published, has truly said:

It may occur in the most healthy country localities with perfect sanitary surroundings and be absent in city slums where from filth, overcrowding, and malaria it might be expected to exist. I do not believe that the very worst conditions of sanitary neglect will ever by themselves alone generate a case of yellow fever; something else must be added thereto.

In the recent outbreak in Jamaica the spread of the disease could not be accounted for, nor could the cases be linked on to one another. There was apparently some general atmospheric condition which affected more or less the whole island nearly at the same time. There were a few individual instances of the disease being carried from place to place, but most of the cases could not be traced in this way. It was a significant fact that while yellow fever attacked certain persons, there was at the same time a general occurrence of malarial fever, especially amongst the natives. To each case of yellow fever in my practice I had at least 30 cases of malarial fever, some of them of a pernicious type. There were some unacclimatised Europeans who did not contract yellow fever, but suffered from malarial fever. During the outbreak an officer living within two miles of Up Park Camp brought his wife and nine children out from England. In a short time I had them all under my care, not with yellow fever, as was expected, but with well-marked malarial fever;

some of them were very ill. Amongst the black and coloured people I had a few cases of pernicious fever, some with jaundice and a few with albuminuria, the temperature going as high as 106° F. The mortality was not high, the disease yielding to quinine. All my cases of yellow fever were Europeans, and with one occasion severe hæmorrhagic cases. The mortality in my practice, not counting the cases I saw in consultation, was 37.5. The treatment I adopted was that known as Sternberg's. I had one well-marked case of hæmoglobinuric fever, the so-called blackwater fever of Africa, not a common disease in Jamaica. Of my yellow fever cases only one died from suppression of urine. This was a bad case from the start; the patient died on the fourth day, and had only secreted 6 ounces of urine during her illness. The "walking cases" are not often met with in Jamaica. Dr. Anderson in his large and long experience never saw a case. I had one some years ago. The disease was then epidemic in Port Royal, and very fatal amongst the sailors and white artillery-men.

Case of Ambulant Yellow Fever.—The commodore and family had a hill residence in St. Andrew, about twelve miles from my house in the Liguanea plains. One night the commodore sent for me to see his secretary, who had the morning before left Port Royal, and had ridden up the hill apparently well. I arrived at midnight, and found my patient lying dead fully dressed. His half-smoked pipe lay on a chair near the bed. The story told me was this. He had felt feverish soon after arriving from Port Royal, but had gone about the garden. An army surgeon who had passed by had seen him, and prescribed quinine. Towards evening, not being able to pass water, he complained to the commodore, who, imagining that it was a case of retention of urine, sent for me, requesting me to bring my catheters. At 10 P.M. he lay down without undressing, and after I had been sent for was found dead. I was able, by slightly inverting the body, to get black vomit to ooze from the mouth, and in drawing off with the catheter about one ounce of urine, all there was in the bladder. I found it one mass of albumen. The skin was slightly yellow, and one nostril blocked with a blood clot. I was informed that he was walking about the grounds a couple of hours before lying down.

A year or two before this I had a case which I think worthy of notice as indicating (1) rapid incubation, (2) decided infection, and (3) much muscular power during the first few hours of a quickly fatal case. In Quain's *Dictionary of Medicine* this case is alluded to in the article on "Incubation of Yellow Fever."

Case of Infection: Sudden Death after Exertion.—Yellow fever was not epidemic at the time, but a fatal sporadic case had occurred in Spanish town in a European inspector of police in a lodging house. After his death the bed had been sunned, but no disinfection of the room had been resorted to. About three days after a young Russian lady, who had been in Jamaica some months as governess in a country family, passed through Spanish town on her way to St. Ann's. She was quite well when she arrived at the lodging house in which the inspector of police had died, and she was put to sleep in the same bed which had only been sunned. The next morning very early she rode on horseback thirteen miles to Linstead, where I was then practising. When she arrived at the house of the rector of the parish, she felt faint on getting off her horse, and on being placed on the sofa vomited. I was sent for and was able to diagnose yellow fever at once. By evening black vomit and retention of urine were present; hæmorrhages soon followed, and she died early next day suddenly from heart failure, falling back on the bed while combing her hair. She had got out of bed, and had taken a looking glass in order to put her hair to rights.

The infection in this case was as rapid as typhus. There can be no doubt that during the stage of calm many deaths occur from injudicious muscular exertion. A patient of mine on the tenth day, while progressing favourably, got up against orders, and walked to the closet in the next room. Hæmatemesis and prolonged convalescence were the consequences. An army surgeon, some years ago, at Up Park Camp, while convalescing, walked to a friend's room near by, and sat up for some time. He became faint, and died the next day from heart failure.

Errors in Diet.—As Dr. Anderson points out errors in diet may have a fatal result. A Royal Engineer officer had apparently weathered the storm, so much so that the mail conveyed to his wife in England comforting accounts of his recovery. His nurse (one of the "Grannies") permitted him to share her breakfast, consisting of salt fish, yam, and roasted green plantains. Soon after he complained of acute pain in the stomach. This was followed by vomiting of blood and speedy collapse.

Although suppression of urine generally brings the case to a rapid end, cases now and then occur in which the patient lasts out three or four days without secreting one drop of urine.

Prolonged Anæmia.—An officer at Up Park Camp, whom I saw frequently in consultation some years ago, lived over 162 hours in this condition with a clear mind until he died in uræmic convulsions. He sat up and was writing a letter when seized with convulsions.

DIAGNOSIS.

Dr. Anderson's remarks on mixed cases are well put an