Personal + other observations
on malarial fevers.

The Relations of Malarious Diseases to Surgical Lessons:—In the
preface to his fourth book Belaus points with
charitable precision his picture of a Surgeon. This
portrait, which has been often reproduced would be
wasting in its most important traits were the
Surgeon not represented as above all things a
Physician.

The French Surgeon Dumas, fifty years ago showed
the influence of medical diseases upon surgical lesion,
and in the course of other remarks astonished some of
the Surgeons of the day by saying that the lesion
in a practical point of view was an insignif-
icient matter if the Surgeon did not understand
the soil in which its evolution took place.

In 1839 Algric wrote:—Dissolved conditions convey
to the constitution of the patient an extraordinary
fault which modifies the character of surgical
Diseases & render them much more troublesome than in
healthy subjects.

1 Belaus. De la medica.
2 C.F.Dumas. Dissertation sur la nature et le trait-
etement des fièvres réintensantes qui compliquent les
glands plages et qui peuvent être assimilées aux
fièvres intermittentes ou réintensantes péricicuses.
Vernueil said, at a Medical Congress at Paris in an able speech delivered only recently, five years ago during the discussion on "General Accidents which may cause death after surgical operations" demonstrated that death is hereditary or acquired and that essential evidence for the prognosis of surgical operations may be known if these operations indicated or contraindicated.

It may seem peculiar that malignant fever with its complications and consequences should have been less known at the beginning of the present century than in the time of Hippocrates, up to the end of the sixteenth century—yet such is undoubtedly the case—Hippocrates was the first author as far as I am aware who fully described intermittent fevers. Arabicic authors were very methodical in their study and description of these fevers, and at a later date we have such men as Fereis, Taglivi, Noher, and others, whose works are not yet forgotten.

"But," says Tourneau, "under these observations the history of march fever was more advanced than it was at the beginning of this century." Griffith in the London Medical Gazette 1867 draws attention to symptoms of intermittent fever supervening upon local lesions, and refers to the subject as one to which attention had not previously been drawn.
Since that time writers have described the effects of Alcoholism—of Diabetes—of Syphilis—of Pregnancy—of Gout—of Malarial Fevers upon surgical cases.

Fourneau seems to have given the cue to the many who have ably preceded his views on the subject. Thus after many days coming back to the picture of Hippocrates which does not divide the Surgeon from the Physician as had too long been the case, and although it is only of late years that malarial intoxication has been admitted amongst the group of constitutional affections which have a powerful effect on traumatic lesions, yet there is no doubt that its place in this respect is as important as Alcoholism or Syphilis, or other more frequently discussed complications. Malarial poisoning complicates traumatic lesions in a vastly of days leaving the accident in which it manifests itself e.g. haemorrhages, fevers, neuralgic affections and more or less exercise on the wounds themselves a powerful influence governing the accidents which complicate them favouring Phlegmon etc.

It does not contraindicate surgical operations but it becomes a source of indications symptoms which are frequently alarming, ought never to be neglected. Every case requires its own appropriate treatment besides that necessary for the lesion, in all cases where pathological complications arise after operations strict investigation of the patient's history should be made.
The principal accidents to which traumatic cases
are subject, which are due to Malarial Poisoning
may be considered under the heads of
Fever,
Hemorrhages, & Neuromastic Affections.

A. Fever:— The most frequent complication is
fever; this fever supervenes it shows itself in the
typical character of Malarial Fevers, not only
with the three periods of cold, hot, Sweating
stage but with the periodic accession of their
return.

Sir James Paget says that "subjects who have
intermittent fevers undergo operations as well as
others of the same class, but in the course of their
recovery they may alarm you by having one
or more acute-fits, exactly resembling those
that precede pyaemia. And more than this;
if a patient has ever had Aquæ and, even many
years afterwards, you perform an operation on
him, Aquæ may seem to be renewed in him
at some short time after the shock or loss of
blood, or whatever the damage he may have
sustained. I have so often noticed this that,
whenever I hear of Severe rigors following any
operation, I ask for a previous history of Aquæ;
I have sometimes found that the patient has
almost forgotten it in the long lapse of time since
he suffered from it. Even beyond this: patients who have
never had Aquæ, or, certainly, have not been aware
of having it, may show signs of it after operations.
Four days after undergoing Lithotomy, not after the first or second time after passing urine, a
clergyman had a severe shivering, followed by
incense heat and sweating. Pyramus seemed to be
at hand but when I asked about Aque he
said he certainly never had it but he had
given large quantities of Quinins to his
Aquich Parishioners. Large doses of Quinins were
given to him: he had no more shivering or
sweating without another sign of febris.

Similarly, about a week after amputation of a
breast, a lady nearly fifty years old had chills
followed by very high temperature & sweating
every evening. She too had never had Aque,
but this was because, as she said, her mother was
always giving her Quinins when as a child
she lived in a Aque district.”

In one case which came under my observation,
The chief cook of the “Nemelus” was one night
badly scalded during a heavy roll, about
a week after, when this arm was rapidly
healing up, I was greatly surprised to hear
his coming aft to me as he felt very
cold” on the alternate days, I was puzzled
a little but learning he had had fevers in
India & China, I gave him a few doses of
Quinins & he was not again troubled. His
temperature was about 103°F on these three days
while I first saw him but it dropped to
normal in a few hours.

B. Haemorrhages:—The second train of symptoms originating from Malarial Poisoning in point of frequency are intermittent Haemorrhages. If we required any proof of the necessity for associating the physician's knowledge properly speaking with that skill especially belonging to the Surgeon this would assuredly result from the study of haemorrhages. Such are the words which Bonnou has placed at the head of his memoir on the intermittent haemorrhages of operations. What can be more cruel after a wound than repeated attacks of loss of blood? What more essential than the diagnosis of the cause which produces them? How else is the treatment to be known? The following case of Intermittent Epistaxis is very instructive although not following an operation. Van der Stor, age 38, an able bodied seaman had been suffering for fully a week from Epistaxis coming on between 11 and 5 o'clock in the morning. Every other day, the haemorrhage was very abundant, stopping of itself after two hours duration, the loss of blood had caused great weakness, he could no longer keep his watch on deck, he said he had never suffered from any serious illness, neither had he had Scurvy, nor Purpura: There was no polypus. The patient, however, gave rise to the suspicion that he had at one time suffered from Intermittent Fever. On inquiry it was found that he had been in Batavia on a voyage about a year.
previous to this I had suffered for a few days from a mild attack of Japa fever which showed itself occasionally on the passage home (always disappearing immediately upon the administration of Quinine). He was ordered 14 grains of the Sulphate of Quinine to be taken in 3 doses, three hours between each, and after two days reported himself as not having had another attack. The hemorrhage came on again in about a week but after that he was not again troubled. He continued taking Quinine for some weeks but after left it off altogether. This is rather interesting as it happened in one of the first of ships, where I was ship Surgeon, while in the Typhus, I contracted a severe fever and was troubled with epipasses which puzzled me not a little at first, they disappeared very soon however as I was continually taking anti-malarial medicine. If I remember correctly I had about a dozen attacks, one every third day.

It is noticeable that the hemorrhage in these cases (where the fever at the same time is in any way marked) always takes place during the cold stage.

In the journals many cases are reported following operations in the French Congress at Montpellier on Oct. 4th, 19. Mr. Massat (Honfleur) spoke on this topic. He quoted a very interesting case of a lady, (after having had a tooth extracted by him) being troubled
Troubled with profound haemorrhage three times, this came every third day; he prescribed quinine and the phenomenon ceased.

Mr. R ally also gave his experience of pulmonary and cutaneous haemorrhages of tuberculous origin. The following case is of unusual interest; it happened in the Royal Infirmary, Edinburgh, and is reported by Professor Grainger Stewart in the British Medical Journal for July 20th, 1878.

Daniel Gardner, aged 37, single, born in Edinburgh, for eighteen years a private in the 7th Regiment, had been at various times in the Edinburgh Infirmary for inflammatory phthisis and pleurisy with effusion. He was in India, and had been seven or eight years there. The rest of his period of service was spent in Britain, with the exception of about six months on the west coast of Africa, during which time he was exposed to wet. His general appearance was that of a phthisical patient, anaemic and emaciated. The virile hepatic dulness in the mamillary line was 6.25 in., the spleen vertically 4.4 in., laterally 3.5 in. The other systems were normal. About once in four or six years, the patient had fits of paroxysmal haematuria, they commenced in 1877, & he had had twenty of them. The fits were usually as follows. After being exposed to slight colds, such as a walk outside, or from no ascertained cause, the shivering came on suddenly, temperature sub-normal, shivering for about
about an hour or a half, sometimes more, sometimes less. During this period he was very cold and miserable, but as the fit went on, his temperature gradually rose until it reached from 100 to 103° F., or less, according to the severity of the fit. Although his temperature reached so high at the end of the shivering stage, yet he felt all his body cold, but his hands and feet were the only parts really cold during this stage. The pulse and respiration also increased in frequency during the shivering stage. At the end of the shivering stage, the fit suddenly changed into a sweating stage. The whole integument now broke out into a copious perspiration, lasting about two hours, sometimes more, sometimes less, the hands sometimes sweated, the feet never, they felt cold throughout the whole fit. Almost as soon as the shivering began, the patient was seized with a desire to pass urine, which was of a dark red colour, muddy and turbid when he passed it. As the shivering fit went on, the urine became darker in colour, contained more and more albumen, until, as the shivering fit passed into the sweating stage, the quantity of urine, intensity of colour, albumen, pulse, respiration, and temperature reached their maximum. He passed urine almost every half-hour during the fit, but in small quantities, although the whole quantity passed for the twenty-four hours was about seventy ounces. The sweating stage lasted always about
about double the shivering stage; generally from one to four hours. As it progressed, the temperature, pulse, and respirations declined, the temperature becoming sub-normal after the fit was over. The urine, during the progress of the sweating stage, gradually became clearer in colour, diminished in quantity, it contained less and less albumen, until the second or third micturition, when the urine was normal. He had no pains in the loins during these attacks; the nerves had had one without the sweating stage, which was said by some authors not to occur. Examination of urine passed during the fit:—

The quantity was about seventy ounces for the twenty-four hours. It was dark red in colour, limpid; specific gravity 1020. Its reaction was acid. It contained a large quantity of albumen, but no bile or sugar. After standing a few hours in a conical glass, a dark red flocculent amorphous deposit settled at the bottom, leaving the upper part of the urine clear, but dark red in colour, but not so dark as port wine. Under the microscope the deposit was found to be made up of granules tube-like, amorphous urate, a few triple phosphate, some epithelial cells. No blood corpuscles could be seen, but Dr. Strang (Resident Physician) deemed one haematin crystal. The blood was examined every hour during the day for several days before some of the fits, but no change was noticed when a fit occurred. The only peculiarity about the blood was that it did not form into rouleaux, some of the
of the corporacles sticking together by their edges; but the bulk of them formed into irregular masses. The colorless corporacles were not increased in number, but some of them were pigmented. There was no pigment floating in the plasma, but there were a great many colorless bodies, something like small white corporacles, to be seen in every field.

On February 14th, 1879, the patient was ordered six grains of Sulphate of Barium twice daily, 1-half grain of Chloride of Ammonium three daily. He had no fit until March 2nd, nineteen days afterwards; the following is a description of the fit which then occurred.

In the evening at 6:30 the patient commenced to shiver. At 7, the temperature was 99.5°; the thermometer went off, and he felt very hot, as if little sick. He also complained of headache, and was very thirsty. At 8:30, the pulse was 75, respirations 22, and the temperature 100. There were a great many small bodies, about one-tenth the size of a red corporacle, floating in the plasma, the urine was not at all discolored, it contained a mere trace of albumen, and on standing, no deposit was seen. Except triple phosphate, the urine was acid in reaction. At 8:30, he commenced to shiver, and continued to do so until 9:10. At 9:15, the pulse was 76, the respirations 24. He had another fit on the 8th, another on the 13th, & another on the 15th. March; all of the same character as the one on March 2nd.

Occasionally in March, when he had no fit, there was albumen in the urine.
G. Neuralgic affections—nerve complications caused by malarial poisoning which follow surgical lesions. On this point we may very briefly that as all traumatic neuralgic affections take an intermittent type whether they are of malarial origin or hot so they give way to quinine and other antiperiodic drugs in the one case equally with the other. The differential diagnosis is thus important from a practical point of view. At the same time the possible cause ought not to be left out of sight in treating such cases. Wiis Mitchell relates a case where neuralgic pains came on in the stump of a toe amputated during an attack of intermittent fever. He remarks as a singular fact that he had observed that purely intermittent neuralgias never take the tertian or any other type except quinoid.

The influence of malarial poison in producing tetanus has not as yet been clearly proved, but instances of tetanus of an intermittent form which have been relieved by quinine are recorded by Mons. Dupre and other surgeons.

Dr. Thomas Watson says "Residues in an intercostal district will sometimes impart a periodic character to other diseases" and apprehends that this explanation will apply to many of the instances which have been observed of hysterical, tetanic or other parasymptomatic complaints occurring at regular intervals. Insanity is by no means an unusual effect of malarial fevers, we find.
a. That it may succeed a series of mild attacks of intermittent fever or may follow a severe attack of remittent fever.

b. It may take any form & be either general or partial.

c. Supervening sometimes at the commencement or during the acute attack & sometimes during convalescence, it always has for its cause want of proper nutrition to the brain.

d. This cause in the first place of reflex origin is maintained by the various alterations in the blood & disturbances to the circulation which accompany in various degress all acute attacks of these fevers.

e. Its appearance is frequently sudden & following upon no symptoms which might predict its appearance.

f. Its duration is generally short. It nearly always ends in restored mental power but cases occur when it becomes chronic or incurable.

g. The treatment does not differ from other forms of insanity.
Causes:-- A. Water.
B. Gases.
   d. Alluvial.
   e. Valleys & Bulks.
   d. Sandy plains.
   e. Granite & Metamorphic.
   F. Iron.

A. Water:-- It is by no means easy to separate causes in many districts or to distinguish how far the influence of polluted water asserts itself in districts where other causes prevail. At the same time many cases of Intermittent & Remittent fevers have been traced to drinking water from marshes in districts where this condition is likely to cause these fevers are unknown. Malarial poisoning is generally the result of the combined effects of much vegetable debris in the soil, sufficient moisture, a warm or high temperature. That the moisture is an essential factor has been proved by the good effects of sub-soil drains. There is little doubt but that the good effects of Eucalyptus Globulus are derived from the large amount of moisture it extracts from the soil with its growth. It thus permanently lowers the level of the sub-soil water, by this means withdrawing from the malarial organisms the medium favourable to their development.

Hippocrates observed that the spleens of those who drank the water of marshes became large, hard, and...
Rhazes said that it produced fever as well as ulcerated spleens.

The Singhalese attribute periodic fever to drinking impure water especially if elephants and buffaloes have been washing in it. This is the general belief in the South of India, as in Canara, Belaghoot, Kanyakumari. Mr. Bettingham of the Madras Civil Service gives a very remarkable instance of a village which no one escaped fever whilst the people drank the impure water from the tanks full of vegetable debris, until a well was dug after which fever disappeared.

Dr. Townsend, Secretary Commissioner of the Central Province of India mentions that the natives believe that the drinking of water from rivers or tanks during the rainy season is a certain cause of fever. At that season the water is full of vegetable debris. He explains in this way the prevalence of ague in dry elevated spots, streams. He adds “which drain forest rice fields cause ague to a greater extent than those which drain fields of wheat.” There is much less vegetable matter in the water which comes from wheat countries than those from rice fields or forests. The same facts have been noticed in this country. Mr. Bloom, of Bedford, cites an instance of a village when by digging wells the health of the community was greatly improved as respect Agera, it mentions that in the village of Houghton, almost the only family,
That, at our time, Escaped Ague was that of a farmer who used well water whereas the other drank ditch water.

Brigade Major fought in the Army Medical Reports instances, the case of the Artillery stationed at Tilbury Fort, whilst the people at the Railway Station, the Goal... and those in the ship lying outside the fort never suffered: the troops being supplied from underground tanks receiving rain water from the roofs of the barracks whilst the others drew water from a spring near the Railway Station.

Captain Resident Smart U.S.A. described an Intermittent Fever which is prevalent in the Rocky Mountain district of North America, where there is no malarious district anywhere in the locality, while cases of Intermittent Fever from the plains rapidly recover there. This fever occurs mostly at times with coincides with the melting of the snow in May, June, July. Dr. Smart found that the snow contained so much as 0.58 per million of aluminium ammonia of the furiet from 0.19 to 0.28 whilst the springs showed only 0.10 per million. Dr. Smart accounts for the organic matters by saying that it is blown away from the plains precipitated with the snow.
Yommasi-Ondele - The air of marshes contains an excess of carbonic acid gas, varying quantities of marsh gas, ammonia, also hydrogen sulphuretted hydrogen, organic debris forming organisms. Sub-soil contains an excess of carbonic acid, of oxygen a little marsh gas, there are also traces of ammonia and sulphuretted hydrogen, more of the latter where the water contains sulphate.

In some marshes besides the usual gases, the air is very rich in sulphuretted hydrogen, the symptoms of anaemia & fatality characteristic of marsh poisoning have been thought to be partly due to this gas. The suspended matter in marsh air consist of vegetable debris, detritus, algae, fungi, bacteria & other micro-organisms. These suspended particles or some of them, the bacillus malariae of Kieb & Tommasi-Ondele & the organism of Lavazan are supposed to be the active agents in the propagation of marsh poisoning.

In Professor Grant's Stewart's Lecture for '90-'91, I made the following notes which will be very interesting especially from a practical point of view. "The blood when examined showed a peculiar mobile body, an animal parasite or something between an animal & a vegetable; it was found within the red corpuscles in hyaline or granular masses, containing pigment, exhibit spontaneous movements like an ameba, varies in size from a 1/1 of a corpuscle to its whole size, these corpuscles lose their pigment and
I become pale appearing like shells or shadows outside of a pigmented mass within. Much more rarely are there corresponding ones in Leucocyta, sometimes these bodies are found as large as corpuscles taken from their eroding division & break up into smaller bodies which are spores or young individual animals: this is said by some to occupy three or 4 days or even in one day, therefore some say this is the rate of growth corresponding to the Diphtheria, Tétanous & Luetian agues. There are also crescent bodies, five or larger than corpuscles which are in our stage of transformation, also free flagellated organism like an Infusoria, sometimes larger forms (spore) are found during the paroxysm, it disappears in the mullusks, but the intracellular bodies are constant, therefore it is supposed that they develop when they are destroyed then the fever disappears, and as a patient is cured by pus, the organism makes its disappearance. This organism has also been found in the brain, kidney & spleen. The blood of acute patient containing these parasites produces the condition in other patients, they either act on the heat, center, or in some other way. The suspended particles may be washed by the wind, great distances still retaining their various properties, uneffaced by dilution or oxidation. Differing therefore from specific poisons from infected Excreta.

C. Soils: As yet we have few good analyses of malariac soils, it would appear the constituents are of little importance in the production...
of the meagre influence, the soils have most productive of malaria may be said to be marshes, alluvial soils, tropical valleys or Nallaks, Sandy plains, Granite & metamorphic rocks, & Iron soils.

(A) Marshes:—These contain a large quantity of water without being flooded, 10 to 25 per cent of organic matter, with abundant vegetation & slight drainage. The mineral constituents are chiefly of Aluminium, Calcium, Magnesium, alkaline sulphates, with Calcium Carbonate. Vegetable matter embedded in soil decomposes very slowly.

(B) Alluvial soils:—These recently formed without being marshy especially give out malaria, the tsaral soils such as we find in the deltas of large rivers such as the Niger when there is a flat-surface & bad outlet are very highly charged with vegetable matter & there is great variation in the height of the ground water & found air.

(C) Tropical valleys & Nallaks collect large quantities of vegetable matter & narrowings of outlets or inlets to the valleys under certain conditions of the prevailing winds may cause the meagre to rise high up the sides of the hills.
D. Sandy plains especially at the foot of tropical hills or in the Tera are constant sources of malaria. This is also the position of the ground on which the town of Lagos is built; at this place there are no surrounding hills yet it is a major zone in the Army Medical Reports. Moor “There is not an acre of ground on the whole island without malaria.” Experience shows that sands overlying alluvial soils exposed to tropical heat are particularly productive of malaria.

E. Granite and Metamorphic Rocks as in Hong Kong, the malaria in these valleys would seem to be caused by a Cryptozanic vegetation in the crevices of the rocks.

F. Iron soils: The red soil of Sierra Leone (which is porous and easily percolated) contains about 30 percent of Oxides of iron but considering that the town is built on the banks of the river and the bare character of the soil and that the Government buildings which stand on the hill are fairly healthy, the cause may not be from the iron oxides. Indeed the oxides of iron being a strong oxidizing agent would tend to have an opposite result; this matter has not been fully settled.

To sum up the various known suspected causes of malaria it would seem that the active agent or microorganism...
- Organisms require like other Bacteria a suitable medium that this medium requires certain conditions (climate) to prepare it for the proper nourishment of the organisms. Thus, purity water or water containing much vegetable debris is alone insufficient but must be associated with certain conditions of soil. There again would appear not to be dangerous until prepared dried or certain temperatures. The higher the temperature the more virulent the poison which emanates from it, ranging from the range of northern climates to THE YELLOW FEVER HEMORRHAGIC REMNANT OF THE TYPHOUS.

Climate conditions modifying the spread of Malaria:— In many instances we find that the change from a malarious district exists in our particular direction - that removal to a certain distance minus malaria. This of course must depend greatly on the prevailing winds and the state of the country. It has been found, e.g., in the Welcheren, that malaria spread rapidly but not to a great distance over water, if fresh water favours its spread more than salt. This may be owing to the presence of salt over salt water or to the purifying effects of winds. Various attempts have been made to estimate how much distance is required to check the poisonous emanations from a given centre. It is well known that low elevations are more dangerous than valleys as in many parts of Sylhet but as a rule unless the malaria is carried from a partially closed outlet of a valley a height of 5000 to 200 feet would
would give fair immunity. There is no doubt that a malicious atmosphere has the tendency to drift up hill just as we see fog drift away from valleys.

In 1816 the British garrison at Antigua was disposed in three separate barracks on fortified hills surrounding the dock-yard. One of the barracks was on an eminence named Monk's Hill, six hundred feet above the level of the marshes. The other two were situated on an eminence called the ridge, one at the height of five hundred, the other three hundred feet. So peculiar were the marshes among the dock-yard was placed that it often happened to a well armed soldier, coming down from Monk's Hill, assuming the night guard in perfect health, to be seized with furious delirium while standing parade. He expired within less than thirty hours after being carried up to his barracks, with a yellow skin, having had black vomiting. Those in the barracks on Monk's Hill, who did not come down, the superior officers, women, children, drummers, had no fever of any kind. Seventeen artillerymen in the barracks at the height of three hundred feet did not come down to the night guard. Malaria reared at night with the night fog from the Earth. Every one of these was attacked with brilliant fevers, some died. At the barracks on the top of the ridge at the height of five hundred feet there rarely occurred any fever worthy of notice. Thus in the same place, the malaria in the level plain, caused
caused continued fever, resembling Yellow Fever, at the elevation of three hundred feet it gave no to intermittent fever, at 500 or 600 feet its influence was scarcely felt at all.

In the neighbourhood of the plains marshes the insects are sported on the intervening hills, the Italians having been taught by experience that these elevated spots afford comparative security against the effect of the Malaria.

Precautions in Malaria:— I now wish to point out a few precautions which I have personally found of great importance in trying to avoid the contagion. In the voyages which I have made to Singapore, Penang, Java, Lisbon & the neighbourhood of the Talgu, Malagosa & the North Brazil, (particularly the River Amazon) the European residents & the natives agree that so far the risk of infection at night, as heat received by the Earth during the day is given off again at night by terrestrial radiation as soon as the Sun disappears below the horizon the air is consequently chilled. This chilling process is at first slow, but as the Earth radiates more heat than it receives from the layers of air immediately above it, the process becomes gradually more rapid. Hence we find that about 3 a.m. in the morning the chilled air is at its coldest, the human frame most liable to infection, if our hair is to be covered, sleep with little or no covering he is glad.

5 Army Medical Report.
Glad to feel the effect of his summer breeze. To draw some covering over him during what a short time previously he felt as an extremely sultry night. (This is an expression which repeatedly happened to myself.) This is the most dangerous hour of the night on land, though it is certainly not so on water, hence the necessity for sleeping under a light covering. The reason for this difference is not far to seek. The specific heat of water allows it to cool much more slowly than land, so the land cools as dew falls, or still more, as fogs arise bearing with them the agents or microorganisms from the surface. The effect is soon felt by those rash enough to expose themselves to the dew or fogs of night.

Ship crews often escape entirely if they sleep on board; however, much of the day they may spend on shore rambling about even in the marshy regions. That this is not always the case, however, is illustrated in my own experience, I never stayed on shore all night in Java yet I was a victim of the terrible malaria, several of the crew were also attacked with Java fever, but they had not even been ashore in the daytime of course the risk is far greater after the heat of summer, or as in the Brahils the dry season. I have known several Portuguese gentlemen who came home to Lisbon to pass that time of the year there. It is well known that persons may be troubled with malaria a considerable time after

being
Being exposed to the poison, the longest period in my experience is six months, in my own case we were nearly a day away from the Java coast when I had the first attack, the other two cases on board were only fifteen days away.

I believe it is a well known fact that harvester going down to work in the rice experience intermittent fevers after returning to their homes.

Habit seems to mitigate the injurious effects of the poison, our Government has utilized this fact by keeping a regiment in a certain place to try and season the man to the malarious influence as it is said that natives do not suffer nearly to the same extent as Europeans, this is not my experience in all the agglut districts I have been in Java struck with the powerful influence it had on Europeans & natives alike, they have a peculiar clayish complexion, headache, belly, little muscular development, short wind, in fact you have in difficulty in recognizing the malarious constitution described by Professor Searle in 1890. This occurs after repeated attacks or in fevers eruptive but who have not had fever, dark complexion, eyes of a metallic blue, kidney hemorrhage, feverish delirium, liver spleen enlarged very often, alimentary system disturbed, blood corpuscles affected who are always kept below 5000.000 per cubic millimeter in the male. Circulatory system heart weak & quick action. Respiration asthma may result but constant cough. Integument: very much perished. Urine of this albumen, if nephritis occurs it is mild. hematie very common, digests, shingles, arthritis, muscle tendinitis, perhaps paralysis. Cerebral: insomnie, delirium, sleep like coma, sometimes insanity. Psychotic seizures always made out.

In the West Indies the negroes do not seem to suffer in this way. Another precaution when possible is to stay indoors, until the muddy fogs have cleared away in the morning, this is the general custom in some parts of India.

I believe that houses in all malarious districts should...
should not be treated on the lee side of a swampy district & should be precluded to those generally seen on the West Coast of Africa where the lower apartments are used for keeping stores & while the upper rooms are used to live in, statistics showing that the rate of mortality is much lower among those people living in the upper stories.

Another prophylactic measure on the West Coast of Africa is sowing all kinds of seeds in the streets. The recent Opium Commission has clearly shown the good effects of this drug as a prophylactic measure in malarious districts among the natives of India.

**Treatment:** As regards this important point the sheet anchor of which is Quinine, personally I found that I derived more benefit from small rather than large doses, the latter tended to upset the stomach even to bring on Jaundice (This frequently happened in my own case) though of course large doses must be given at all hazards for the Remittent & remittive forms. I found the greatest benefit from taking two grains of the Sulphate of Quinine twice daily, about an hour or half after meals in the intervals between the attacks of Epson Salt every second morning, I took this for three months after the last attack & at intervals.
intervals afterwards especially when I returned to
an aguish district.
In the severe forms of ague with very high
temperature, muttering delirium, vomiting during
the cold stage and haemorrhages I found
Phenacetin invaluable in reducing the temperature
during the attack. Aspirin and Antifebrine having
failed to keep it down.
The usual custom in Java is to drink Chort as
soon as they feel the cold stage coming on.
They unanimously affirm that it shortens
the cold stage considerably.
I found great benefit from living in the hilly
country, taking abundant exercise especially
horse riding. To avoid chills getting wet
of all things.
In my notes on ague I find the following “
the best way to take Lumine is two or three
hours before the attack is due, when sure
then it destroys the parasites, whereas when
taken during the attack it fails to influence the
parasites.” I have always found the above
correct, in fact after repeated trials I found
that taking the drug during the attack was
utterly useless.