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AN

# INAUGURAL DISSERTATION

ON

*Malaria*

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## UNIVERSITY OF NASHVILLE,

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BY

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Malaria; Its source and effects upon the human system, and the remedies by which it may be eliminated from the economy.

In reference to the source of Malaria, the major portion of the Medical profession (as well as the "rest of mankind") have pretty generally agreed, that Malaria is the product, of vegetable decomposition.

Whilst others maintain that Water is the element out of which the malarial poison is produced and that heat is the agent in its production.

The former theory brings much to its support which seems plausible. But which has no foundation in truth. It has long

been taught and believed, and has in the fullest sense of the term, the Confidence of almost the entire Medical World. In the investigation of this subject, we are aware of the fact that we labour under many disadvantages, so far as public opinion is concerned. For when we dare say, that we do not believe that the source of Malaria, is generally known and understood we are told, that it is impudence in the superlative degree, to say that our "fathers" in medicine, (great as they claim, and as we acknowledge them to have been) had wrong and did not know from whence came the Malarial poison; We should consider it a herculean task indeed, to undertake to remodel public opinion on this subject. And surely we do not expect to convince any of the "foggy" family, that

We are right, and thus induce  
them, to abandon the old and  
time honored theory, for such  
are the partialities, and prejudices  
of our race, that we fondly  
cling, to those things which  
now, come up with us from  
infancy to maturity, and, <sup>which</sup> are  
destined to go with, us down the  
steep hill of decline.

Nevertheless, we are thoroughly  
satisfied, that by the statement  
of a few facts, we shall be  
able to give a plausible, if  
not a good reason, for the  
"faith that is in us".

We now live twenty one years  
in West Tennessee twelve  
miles from the Mississippi  
river, half way between  
the Kentucky & Mississippi  
lines, with the Forked deer river  
on the north, and the Hatchie,

On the South with a territory of thirty miles in extent between them, all of these rivers have wide spread bottoms, which are annually overflowed. The overflows occurring, some years, as early as the month of February, or the middle of March, and passing off, by the first of April,

Occasionally however, these late towns are not overflowed until the middle of April or the first of May, and the overflows, may not pass off, probably sooner, than the first or the tenth of June.

We have given these overflows and what we believe to be their results, in reference to the healthfulness of this district, our attention, for the last ten years, and do not

believe anything about it, But  
we know, that after a late  
overflow, the inhabitants  
suffer, dreadfully, on account  
of Malaria, whereas when  
the overflow comes early, we  
know, few of the pangs, caused  
by malarial fever,

Take as an instance the year  
1854, when the overflow did  
not come, until the last of  
April, and passed off, about the  
twenty fifth of May, In this  
instance the Citizens of this  
District, suffered more, for  
a period of some six or seven  
weeks, (commencing about,  
the tenth of June) than  
they ever had before, or have  
since in any one year,  
And we undertake to account,  
for this Malaria in this way,  
While these bottoms, now

Course, with water, a considerable amount, of it found its way into the Sandy Subsoil (for such it is) the Lakes, Ponds, and Gloughs, and then there are Sand banks made up by deposits from the Channel of the Mississippi and covering thousands of acres to the depth of from one to eight or ten feet, all this serves as a grand Reservoir and will contain a vast amount of water. Then came the hot Sun of June, July, and August upon it malaria was produced and in, twelve or fifteen days those persons living adjacent to these low lands were prostrated with good old fashioned malarial or autumnal fever,

We will now call attention to the year 1834, and in this instance those bottoms were not overflowed until the 15. of March, the overflow going off by the first of April.

During this whole Spring summer and fall, the "natives" of this district, had decidedly better health, than they have ever had, in proportion to the population, during any year since the settlement of the country.

Here we undertake to say without the fear of successful contradiction, is proof irrefragable, going as far as justice will demand, to establish the fact, that Malaria is produced from water.

The drought set in pretty soon after the overflow passed off,



The Spring was cool and pleasant and instead of having the usual winds common to the month of March, This month was calm, and in April, we had a constant and strong wind such as we usually have in March, and by the 20.<sup>th</sup> of May these bottoms were dryer than they were ever known to be by the first of August before, Thus we saw that the overflow passed off early, and the strong winds of April came along, and by the aid of the mild sun of April and May, the water in the soil sloughs and ponds was carried away, the whole of these bottoms (except some three or four small lakes) were left perfectly dry and the hot sun of June, July, and August, found comparatively

Nothing to make Malaria of,  
Consequently, there was, not  
more than, One Case, of Malaria  
fever, for twenty, compared  
with 1850, When Men, Women,  
and Children, all were,  
prostrated with Malaria  
fever.

Here those who contend  
that Malaria, is the product  
of vegetable decomposition  
will come in and tell us that  
all this water in the Lakes,  
Ponds, Sloughs, Sand banks, and  
Subsoil, has only furnished  
the necessary amount of  
"Moisture" requisite to the decom-  
position of vegetable substances  
This assertion of theirs is in its  
nature, well calculated  
independent of all other Consider-  
ations, to make the impression  
that their Theory is the only true one.

For the idea of decomposition or decay seems to carry with it also the idea that something is generated while decomposition is going on with which the atmosphere is to be impregnated, and which is capable, of making an unwholesome impress upon the economy, But then we ask is it probable that vegetable decomposition would go on so rapidly that in ten, fifteen, or twenty days a sufficient quantity of Malaria would be generated at one point, and transmitted by the winds to another point five or ten miles distant and in a few hours make its impress and develop in half the people of a densely populated neighbourhood Bilious, Remittent, or Intermittent fever. We do not think so,

But in as much, as it is contended  
so strenuously, that vegetable  
Substances have something to do  
in the production of the Malarial  
poison, we will grant, something  
now as we think, that we have  
a purpose for these Substances  
to subserve, which is strictly  
in accordance, with our view  
of this Subject.

Then we claim, that all those  
Vegetables, since our purpose  
tree, in forming Parasitis, and  
during the period of growth  
they are being filled with a  
fluid, and by the time they  
reach the state of maturity  
there is a considerable amount  
of water, collected. Then comes  
decomposition, and all this  
water is acted upon by the  
Sun, and an amount of  
Materia, is produced proportional

to the amount of water  
contained

We will call attention to the  
statement, made by our opponents  
in reference to the time Malaria  
is found making its developments  
They tell us that we have  
more malarial fever in Au-  
tumn, than at any other time  
and that this is owing to there  
being a greater amount of decomposi-  
tion at this time, True there  
is more decomposition, But  
we do not admit that there  
is more Malarial fever  
For we have seen more  
Malarial fever in June and  
July, than we have seen in  
our August and the three  
Autumnal months all put  
together and, and we have this fact  
established in our Malarial district  
in the year 1850,

And the same may be said of every year, in which we have a late overflow. Thus how we endeavored to exhibit, our opinions, in reference to Malarial Poison, & its source, Chemically, nothing is known of Malaria, hitherto, as we think that it is necessary that we should know its Chemical Composition, since we know it as soon, as we see it make its impress in the economy, and knowing also that we <sup>know</sup> close at hand its antidote,

Malaria, finds its way into the system, most probably through the Lungs, passing into the Circulation, from the air cells by the process of absorption. Some are of the opinion, that it is absorbed through the skin, and possibly it may find its way to the

Stomach in Connection with the  
Saliva food &c,

Be this as it may, we know  
that it gets into the system,  
Its characteristic morbid effects  
in the economy, are Intermittent  
and Remittent Bilious Fevers  
which prevail Endemically, and  
are characterised, by febrile paroxysms  
The varieties of these fevers  
and their characteristic phenomena  
now claim our attention.

First the Intermittent variety,  
with its subdivisions,

First, the quotidian occurring  
most frequently in the forenoon  
and passing off by night  
Second, the tertian, occurring  
on alternate days, generally  
between eleven o'clock A.M.  
and two P.M., the paroxysm  
terminating at from six to  
nine o'clock at night.

I find the quartan, in this variety  
there are two rest days between  
the paroxysms, the paroxysm, being  
as apt to occur, at one hour  
(between eight in the morning  
and two in the evening) as an-  
other. Let us bear in mind, too  
that there is no fixed regular  
hour, for the recurrence of the  
paroxysm, in any of the vari-  
eties, for they all frequently  
recur at different periods,  
of the day.

There is a difference, in the  
length of the paroxysms, in these  
three varieties. The quartan  
has the longest Cold stage  
but take both the Cold stage  
and the hot <sup>and</sup> the whole  
paroxysm, is the shortest.  
We have not observed any marked  
difference, in the length of the



Other varieties. We might add  
that we not unfrequently meet  
with double quotidian, two  
paroxysms a day.

Double tertians, and double  
quartans, are sometimes met  
with, but we will pass by them  
different, changes. There are  
also, some minor divisions, which  
we do not deem important  
from the fact that we scarcely  
ever meet them, and think  
it only necessary, that we  
shall be able to know them  
when we see them, The cold,  
and hot stages, are sufficient  
guides to enable us to make  
a diagnosis of the character of disease,  
There is not as much difference  
in reference to the season of  
occurrence, as there is generally  
said to be, For we have seen  
all the ordinary varieties

in all the Chill Seasons.

The most striking uniformity that we have observed is that the quartan, occurs mostly in the latter part of autumn,

Symptoms with the Three Stages,

First the Cold stage is frequently preceded a day or two with "Aching of the bones," When the Chill is ushered in with shivering, Constriction, Skin harsh or rough, Chattering of the Teeth, The precordial region is oppressed, Nausea and some times vomiting, Pulse quick & Small, head and back-ach, with yawning and stretching,

Then comes the hot stage with slight febrile flushes, at first, soon however the

Whole body is hot, and dry  
There is great thirst, the Carotids  
Throb, pulse frequent and full,  
The hot stage will last some  
four six or eight hours, and  
then the Secretory stage comes  
on, Perspiration, begins on the  
face, forehead and neck, and  
pretty soon, the whole body is  
bathed, in a profuse perspira-  
tion. If however, this does  
not occur, there will be  
excessive urination.

Treatment: If there was  
anything outside of the chills  
and fever requiring an  
Emetic or Cathartic we  
should administer them,  
Quinine, is the only sure  
remedy. But if we had a  
patient, whose stomach  
was loaded, and there was  
nausea, and little or no,

determination to the Brain, we would give an Emetic, Warm water might meet the indication, if it did not, we would give 10. or 15 grs of Ipecac, or in other words graduate the dose to Suit the Case, by this treatment we would not only expect to relax the Stomach, but also, to Overcome the Constriction relax the System, and favour Deaphoresis.

The Circumstances requiring a cathartic, would be Torpidity of the bowels, or if the patient were throwing off small portions, of Bile, and his whole System, was saturated, with it, we would not hesitate to give a cathartic.

Our prescription would be 10. or 12 grs each of Calomel and Rhubarb, or Calomel & jalap.

Given at bed time, and it might  
be advisable, especially if the  
patient, ~~was~~ a nervous one to  
add, a  $\frac{1}{2}$  gr Opium, to ensure rest.  
And if necessary, give a dose  
of Oil, or something else to  
"work off" the, Calomel, in 6 hours  
if donat. Conceive that we  
have commenced. During the  
case, This Emetic and Cathartic  
have been given, for something  
else, without reference to the  
Chill and fever,

Quinine, is the great remedy  
and upon it we place our  
Main reliance, It, acts as  
a neutralizer and makes  
the Malarial poison ineffi-  
cient, equalises and tranquillises  
the System. — Given true to the  
general System, — and quells  
nervous excitement,

During the hot stage, if there

was great pain in the head and  
excessive throbbing of the Carotids,  
Cold water poured in a gentle stream  
on the head would prove beneficial  
and if necessary to acid perspiration  
an aromatic, diaphoretic. The bark  
of the Sassafras root or something  
of the sort, should be admin-  
istered,

But now we come to the  
curative treatment which is  
the exhibition of Quinine,  
As soon as the paroxysm has  
passed off, we would give  
6 or 10 grs (measuring the dose by  
the patient) of Quinine, and then  
every four or five hours give  
4 or 5 grs, in order that the patient  
might be properly under its  
influence at the time for the  
next paroxysm to come on  
Assuming that we are  
treating the case after the first,

Parapsyche, we cannot tell so well, whether we have one or the other of the varieties to treat, and in order that we make sure work we should guard the patient, against, both the tertian and quartan.

In the mean time, we would throw in a few grs of Opium, along with the Quinine Pills - Remittent Fever with is two Varieties

Here too the attack comes on with Chillsiness or rigors followed, by a reactionary fever which lasts, six, eight, ten, or twelve hours. When there will be a remission of the febrile symptoms yet the fever does not intermit

Symptoms. For a few days before the attack there is more less general indisposition, the patient

is neither well nor is he sick (to  
to use his own language) all at  
once he is forced to bed. Has pain  
in the head, back, & limbs,

Uneasiness at the epigastrium  
Tongue generally coated or  
furred at the root, Complex-  
ion Sallow. All of these

Symptoms, may manifest  
themselves, before the rigors  
come, After which comes the  
reaction, accompanied with  
violent pain in the head,  
Throbbing of the Carotids  
with more or less determination  
to the Brain, Nausea and vomiting,  
Skin dry and hot, Thirst great  
bowels constipated. Pulse quick  
and full. Urine scanty,  
After delirium, These symptoms  
may continue, sixteen or eighteen  
hours, When profuse perspiration  
comes out, and pretty soon



the violence of the paroxysm will have passed off, the patient feels comparatively pleasant, yet the fever, does not intermit. The remission may last, from four to twelve hours, when another paroxysm comes on, which will probably be longer than the first. The remissions, getting shorter and if not arrested, it may end in a continued fever. The paroxysms are frequent or infrequent, according as the type of the fever may be quotidian or tertian, and it may infrequently terminate in its original type, an ordinary Bilious Fever will run its course within, fifteen days, and some times in seven days. Treatment, Malaria being the cause, Quinine, will make the

Cure in ordinary Cases, it should be given in doses of 3, 4, or 5 grs every four or five hours, to the end of the disease unless there was great determination to the brain, with threatened inflammation, of that organ then the Irium should be withheld and if necessary, blood letting resorted to with a hope not only of arresting inflammation but also of getting the system in a proper condition for the Irium to produce its legitimate effect. We would not give emetics for fear, of producing or aiding Congestion, Castorics might be indicated to relieve Constipation and to carry off bilious matter the whole system not infrequently being saturated with bile, might be relieved, by Blew Mass and Jalap, Cold Sponging, Cooling drinks Opium &c, given, to make the

patient as comfortable as possible, To sum up, briefly our treatment, it would, be, Diemium given freely. Cathartes if there was excess of bile, or Constipation, Blood letting if there was threatened inflammation, Opium &c.

Infamatory, Remittent fever, In this form, the great difference, is mainly in the attack being more violent, and the treatment should be the same, varying however, to meet and overcome the inflammatory symptoms,

Pernicious, or Congestive Fever. This may be intermittent, <sup>or</sup> remittent, and it is said to be a continued fever, Why it is that some have one

Variety of autumnal fever and  
Others how other varieties  
cannot, be satisfactorily explained  
unless it be that some are more  
easily impressible with malaria  
than others, Or that by a longer  
exposure a greater amount  
of the malarial poison finds  
its way into the economy,

Symptoms, - Some times the  
functions of organic life  
are mostly involved,

Then again the animal functions  
suffer most in some cases,

Some times the first paroxysm  
resembles an ordinary intermittent  
At others it has its own peculiar  
features,

The attack may come on at  
any hour of the day or night,  
A. remittent fever of a few  
days standing may suddenly  
run into a congested chill and,

take the life of its victim in a few hours.

The paroxysms, may return every first, second, and some times though not often on the third day. The latter part of summer and the early part of the fall are the periods of their occurrence. Oppression and depression are frequently the chief diagnostic signs. More frequently however there is a sense of chilliness, restlessness, great thirst, breathing slow but quick, pulse weak, extremities icy cold, and clammy presenting a shrivelled appearance while the chest, is warm or hot, pain in the head and back. A death like, palor, shows the continuance, hope seems to have fled and the patient yields to despair. These symptoms will continue for two,

Three or four hours, and reaction will come on slowly, or it may be eight hours, or even two or three days before there is a perfect reaction.

Treatment. If the patient was in the paralytic, we would know that some one or more vital organs were in a state of engorgement and should not attempt to bring on reaction by pouring in hot teas brandy<sup>s</sup> peppers &c, and thus invite more blood to those organs which are already engorged and overloaded. But we would adopt the practice of those wise Medical philosophers, who, aided by experiment have demonstrated the fact, that by the application of Cold water to the whole Surface, blood is invited to the extremities and thus the engorged organs are relieved.

If we were called to such a  
Case, we would, put the patient in  
a cold bath, (Ice Cold if possible)  
or pour Cold water on him, until  
Chilliness, came on, then, the patient  
should be put to bed, & rapped up  
well, ~~nothing~~ or nothing could  
be accomplished by Quinine  
in the Paroxysm, and should not  
be given until it had passed  
off,  $\frac{1}{2}$  gr. 7.2, or 100 grs should  
divided into, 8, or 10, doses and given,  
in the intervals, between the paroxys-  
ms, relying upon this remedy  
in this disease  
as we do in all Malarial  
fevers, we would persist in its  
administration, until, the patient  
was freed from the disease,  
Emetics, nor Aemesection, should  
not be employed, But if the  
bowels, were, inactive some  
mild Cathartic, should be  
given, the Liver will not allow the use  
of Calomel here,

## Anatomical Characters.

These differ mainly in degree  
In intermittent, remittent and  
Congestive fevers, there is engorgement  
of the Liver, enlargement of the  
Spleen, inflammation of the  
Brain, or its Membranes, In  
remittent and Congestive, the Stomach  
and bowels are more or less  
involved, In intermittent they scarcely  
ever suffer, In Congestive fever  
the force of the disease is frequ-  
ently spent upon the heart,  
This organ always suffers more  
or less, and being paralysed fails  
to perform its office to the proper  
extent, The ordinary amount of  
blood is not carried to the extremities  
and the Veins being busily engaged  
all the while carrying blood to the  
heart, that organ becomes  
engorged, nearly all the blood  
in the body is collected at



One point in the system, hence the  
Cold, extremities, and hot chest  
hence the Venæ Cavæ, pulmonary veins  
Lungs and heart suffer,

Malarial fevers prevail in that portion  
of the United States, lying between  
the northern lakes and the Gulf  
of Mexico, being most prevalent  
in the middle and southern states,

Thus have we attempted to acco-  
unt, for the production of Ma-  
laria and to allude briefly to  
its chief characteristic effects,  
and also a few leading reme-  
dies requisite to counteract these  
effects. And much might be  
said of Bilious Colic, Bilious  
Diarrhoea, Bilious Dysentery, Bilious  
Pleurisy, Bilious Pneumonia,  
Neuralgiae,