Thesis on

Malaria and Intermittent Fever.-

by.

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Introduction.

As it is a rule in this university, that every student before taking his degree must write an essay on any subject he chooses. it is but natural to think that that subject will be the one with which he is most familiar. I have consequently chosen as the subject of the following Thesis. "Intermittent fever and malaria," having had many opportunities of studying the causes, symptoms &c of Intermittent fever, and the dreadful effects of malaria in Egypt, that country of waving palms and clear and cloudless skies.

In writing it I have had a great difficulty to encounter in being compelled to do so in a strange language. Egyptian thoughts and ideas, cannot rightly be expressed in English; and I

hope I will be excused if my sentences are not so finely turned, and my expressions not so neat and concise as they would have been, had I not been, as it were, "A stranger in a strange land." If, however, I have succeeded in conveying my ideas in language which can, at least be understood, I will be satisfied, and more than repaid for the trouble and care I have taken to do so.

In describing intermittent fever it will be necessary to consider it under several heads; first. its

History.

Since the time of Hippocrates low and marshy places have been looked upon as the localities in which the disease principally rages. They were likewise known to Galen; and the architects of the middle ages Paladius and Vitruvius make distinct mention of the insalubrity of marshy countries. This doctrine however seems to have been lost sight of so as to be utterly unknown to Sydenham. The Italians also seem to have been equally unacquainted with it until the time of Lancisi, who has the great merit of having again noticed it, and revived the subject in a treatise entitled "De noxiis paludum effluviis." This work, which was a matter of great interest to this country on account

of the rapid extension of its colonies, attracted the attention of the profession, and has laid the foundation of that more free investigation of the laws of Paludal diseases, which affords evidence of having been prosecuted by Lind, Pringle, and a host of other British and continental writers.

The Effects.

The effects of paludal malaria are evident in our times as those arising from the Pontine marshes, those of Essex, those of Cambridge, Lancashire, the East Riding of Yorkshire, and Berwickshire. In Holland also the same diseases prevail in the towns situated on the banks of the Meuse. In France, the alluvial soil seems to extend over a large surface of ground, such as in Normandy. In various other parts there are some other places in which intermittent fever prevails to a great extent, as in

Seville, Cadiz, and many other towns situated on the southern coast of Spain. In Italy also, the Mantuan, Florentine, and Roman marshes are celebrated for malaria as well as the Pontine. The islands of Minorca, Sicily, Sardinia, and the Ionian islands have similar effects on the inhabitants of producing this disease. It is a well known fact, that, when the English and the French are staying at these places, this disease frequently proves fatal to them.

Rosetta, and Damietta are productive of malaria; but Scanderine, Tripoli, and Tairout are most exposed to this disease. In some of these places, Intermittent fever prevails as commonly as in Holland, England, and some other places, generally accompanied to a great extent by dysentery. This fever is not however confined to marshy districts, as miasmata arises even more frequently from want of

cleanliness, & want of ventilation, or from a number of persons being confined together in a close district of a large town. especially in a manufacturing town where the atmosphere is rendered still more impure by its mixture with noxious gases.

Causes

of Intermittent Fever.

They are divided into two great divisions, the one is the predisposing and the other the exciting.

The former may be enumerated as follows, - debility of the patient, Plethoric habits, - feebleness from excessive evacuation, excess of fear, either eating or the gratification of the sensual passions, great mental or corporeal exertion, impurity of the atmosphere, or a sudden alteration in the temperature of the body.

The exciting causes are malaria, putrefaction, either of vegetable or animal matter. But the former is the real cause.

Intro-duction of Catheter into the urethra

may give rise to this disease. Indigestible food in the stomach, intestinal worms, exhaustion from fatigue or hunger, may produce intermittent fever. After Mental depression during sleep. the poison seems to find its way more readily into the system than at other times. Exposure to the heat of the sun, a cold bath, excessive exertion, or even a dose of purgative medecine may occasion the paroxysms of this disease. The contrast between the cold of the morning and evening and the midday heat favours the development of this affection. in the latter part of Summer, and the beginning of Autumn. The inhabitants of Miasmatic districts even after their removal to healthy districts, are nevertheless frequently attacked by most diseases, in consequence of their susceptibility to the new exciting influence to which they are exposed. Swamps and marshy grounds, from irrigation of fields, gardens &c. and places where vapours abound after sunset are favourable

to the production of intermittent fever. Scanderine, Tripoli, Bairout, Acre and Jaffa, are places much exposed to this malady. That it arises from swampy and marshy places we have strong proof from what occurred when Ibrahim Pasha attacked Syria. He was told that the people were harrassed by the ague. He immediately drained the pools and the stagnant waters. The effect was salutary for two years, after which the negligence of the inhabitants in continuing the draining brought the disease back worse than it was before. Syria affords a most striking feature From its extensive fields, irrigated by numerous rivers which pass through it, besides from the filth of the inhabitants, and the collection of smoking heaps of animal and vegetable matter in the court-yards and corners of the streets, from the crowded state of the houses and their want of ventilation, and from the offensive smell of their open sewers, running

through the bazaars and streets, the effluvia breaks out in hot weather. the people become depressed and lazy. they have no appetite for eating. they fall to sleep, and, unable to work their vital power diminishes. After all these phenomena have occurred, intermittent fever prevails over the country. In Egypt, during the Hammasine, this disease appears to take place more frequently than at any other time. Obstructed viscera may be the cause of this affection: but this very rarely happens except during the summer season. While Ibrahim Pasha was returning to Egypt with his troops from Syria, it is said that he lost a great number from intermittent fever, and the heat of the weather, as well as from the want of water in the midst of the burning sands where there was not a tree to shelter the poor wretches. "This malady is almost always to be met with in every locality all over the surface of the globe. Where there is a large surface of stagnant water exposed to

the action of the rays of the sun." I have seen wherever there is a thick cluster of date trees in our country, very often intermittent fevers exist in its neighbourhood, especially if there is also a large forest of palms. as is to be observed at Fayoum, Assouan, and some other towns in Egypt. and Abyssinia. It often occurs also during the date-harvest. The construction of our burying-grounds is favourable for producing plague. seeing that they are situated in the hearts of the towns. and the bodies being laid in shallow graves without lores, soon putrefying, scatter around an effluvium, which being inhaled by the inhabitants of the surrounding districts, becomes the origin of the death-dealing plague which annually cuts off thousands of victims. Hence, lately, the bodies have been prohibited from being buried in these cemetries, and they are now buried further out from the cities. About 14 years ago we had a severe attack of murrain among the cattle in Egypt. and the eating of their flesh engendered

intermittent fevers. Malaria prevailed at that time to a great extent for this simple reason. The dead bodies being thrown away into some stagnant pool, small canal, or stream, became putrefied and the atmosphere was rendered unhealthy to the inhabitants of the surrounding districts.

Having thus described the causes of this disease, I will now proceed to give a particular description of malaria. one of the principal causes of intermittent fever.

Malaria

is the cause of both ordinary and intermittent fevers. cholera plague dysentery, and nervous diseases. This miasm is the great cause of death to one-half of the human race. Marsh-fever exists in this country, Oliver Cromwell and James I. died of it. "The value "of life, of longevity, of survivorship, the "average chance of approaching the "proverbial limit of threescore and ten.

"is the measure of the salubrity of a coun-
"try. That salubrity depends merely on
"the presence or absence of malaria."
In England the average of life is a-
bout fifty. In Holland 25. In some parts
of France it is 20 or even 18 years.
In Italy and Sicily malaria prevails
to a fearful extent.
What is commonly called a marsh is
not necessary for the production of malaria;
for we may have no marshy ground, and
yet malaria may appear in these places.
All believe that a marsh or swamp will
produce this disease. It is fallacious to lim-
it our decision of the presence of malaria.
by the occurrence of ague; for other diseases,
such as the summer and autumn fever of hot
climates, are produced by this cause. as is
also dysentery. Physicians who have not travel-
led are apt to be mislead, and imagine all such
diseases to be typhus, and call them so with great
laxity. Hence we must believe that wherever
dysentery and non contagious fevers are present,
malaria exists, even although there be no ague.

Some consider that wherever there is a clayey soil, it must be unhealthy, whereas, a gravelly soil is healthy to the human race. The reason is that, the latter soil is easily drained and prevents the fermentation of vegetable matter, which is the cause of malaria. But sometimes we find it unhealthy when the vegetation deposited on it ferments; while on the other hand clayey soil which does not form this vegetation is healthy.

The test of the presence of malaria is human susceptibility. Those who have once suffered from ague, are very liable to be attacked by it again, on the presence of the slightest exciting cause. Hence if we find the revival of this complaint we may suppose the presence of malaria has produced it.

Circumstances favourable to the production of Malaria.—

First. Marshy districts are peculiarly liable to malaria. Some believe that a certain extent of marsh is necessary to pro-

duce it: but it is not the case. For every part of a large marsh produces malaria. And consequently if the surface, which generates the poison be diminished, the fumes will be still there. It is quite possible that all the effects of malaria could be produced by a very small quantity of it. For it is equally invisible and imponderable with the matter of contagion. Fresh-water marshes are commonly considered to be dangerous to health. but it was thought at one time that salt-water ones were not so. however, malaria is produced by salt-water marshes especially in hot climates. The salt marshes of Normandy, especially around Dieul produce intermittent fever. The French shores of the Mediterranean, the shores of the Adriatic, Greece, Italy, Sicily, Sardinia the Crimea, Spain, Rosetta and Damietta are all liable to intermittent fever. It has been observed that some of the most violent fevers of Holland resulted from eruptions of the sea which left behind dense masses of putrefaction

and an insupperable smell. We know that putrefaction will take place in salt water as well as in fresh.

Woods generate Malaria, especially in Tropical climates. The jungle fevers of India prove this; but it is merely to the low-lying jungles and to the forests around Mysore that the production is attributed. But there are some highly wooded places in the world, where malaria is unknown. A country which was healthy before may, by cutting down the woods be made unhealthy, as Dr Rush observed in Pennsylvania. Often epidemics follow the cutting down of a forest, and do not disappear till the land has been under a long cultivation. Some districts of France which were healthy before, by cutting down the woods which surrounded them were rendered the very opposite. This probably results from the action of the sun on the ground, as Pliny says. Rice grounds are productive of malaria being generally nothing more than mere swamps,

In France the growth of rice has been prohibited as being most injurious to the health of the inhabitants, having introduced diseases unknown previous to its culture. Summer fevers, dropsy and the different affections of the viscera, have all resulted from this cause. Life in these parts of France seldom extends to more than 40 years, and the people are every year decimated by the diseases resulting from rice-ground malaria.

In some parts of Russia the cultivation of rice has been prohibited for the same reason. Napoleon intended to do the same with France and Italy. In India it is said that the rice-grounds do not produce malaria but this is doubtful. It may be possible that rice-grounds vary in healthiness and unhealthiness according to the soil, situation, peculiarities of cultivation &c But it is well known that at certain periods there are fevers of peculiar virulence, which are productive of immense mortality. The inundations of the Ganges

and other large Indian rivers, have, doubtless, a good deal to do with it; but it is questionable if they are a sufficient cause for those fevers, if we exclude the rice-grounds.

Some maintain that rushy pools and swamps in high situations are incapable of producing malaria. For we find in Wales, according to Dr MacCulloch's observation that intermittent fevers are common even at high elevations. It has been stated by travellers that the inundations of the Nile are not productive of malaria but I think this is not quite correct. for there are doubtless a great cause of malaria in Egypt. And it seems as if Providence, whilst fitting the Nile for fertilizing the country had also endowed it with a supernatural power of scattering along its course death and disease. At the overflowing of that mighty river, lower Egypt becomes like a sea in which the towns and villages appear like so many islands.

Towards the end of September the seeds be-

gin to germinate. After this takes place, a west wind and fogs commence, producing Ophthalmia and the other diseases which are peculiarly destructive in Egypt. such as Plague, dysentery, diarrhea. elephantiasis. leprosy, catarrh, intermittent fevers. scurvy bilious fever, diseases of the liver and contagious fevers, as well as other diseases of inflammatory type. It may be worth mentioning that during the campaign of 1801, in Egypt. the French army was chiefly harrassed by these diseases. These diseases are more common in some places than in others. Such as the Ague is found in Rosetta and Damietta, and some other villages on the banks of the Nile more frequently than in any other place in Egypt. And the reason of this is.- they are more exposed to the overflowing of the river. and the water, becoming stagnant, produces malaria to a great extent, which, being inhaled by the inhabitants, depresses the nervous system and acts as a poison. The patient is then attacked by twitchings in

the spine and a violent headache, during which his pulse beats like a hammer. & a fever succeeds, which, unless checked results in death.

Canals are said to be productive of malaria as is seen in the case of Holland. The canals in France are most injurious to the inhabitants according to Macfarlane. The canals in our country from what I have seen are productive of malaria. For instance, the canals which run through Grand Cairo. during the inundation of the Nile, become filled with water, which, when that river again returns to its usual channel, becomes stagnant and being the receptacle of all the sewers of the city, proves a fertile source for the production of malaria. On the other hand those houses which are situated on the banks of the Nile are much more free from the accumulation of putrefied matter, which is carried by the running stream past them.

The draining of a loch is attended by noxious matters which will for the time being greatly increase the evils which resulted from

its waters. It is quite possible that where dry land exists malaria may be generated principally by the drains which pass through it. All common summer fevers of this country are in all probability the result of an unsuspected malaria. Hence we must take care not to confound miasmatic with Typhus fever.

Living vegetation is not necessary to produce malaria for we have seen the process of steeping flax and hemp proved to produce miasmatic effluvia. This in some places is greater than in others. Lancisi mentions a case of this kind. So also M. Bourges gives instances in which it is injurious both in France and Germany. In our own country the process is carried on to a greater extent, and the result is proportionally greater. These places are very often situated near the towns and villages and produce an immense amount of harm. I had a friend who, being in the habit of visiting one of these places was attacked by intermittent fever. He was advised to remove to a place free

from all miasmatic effluvia, and the result was that he was cured without any medicine being given to him.

The manufacture of Indigo is productive of malaria. This is especially seen in tropical climates, such as, India, Egypt, and some other parts of Africa. The effect produced are, I believe something similar to those produced by the manufacture of hemp. Spring-water may induce fever, which, however, has not commonly been looked upon as typhus.

Bilge-water is always very noxious in ships, the mortality in those which contain any being much greater than in those which are dry-bottomed.

Dung-hills and pools about Farm-houses, &c are common causes of malaria. Putrefying seaweed is a great cause of fevers, as has been proved in Holland and France. Volcanic soils are said to be productive of miasmatic effluvia, but no evidence has been adduced to prove this. Dr Ferguson considers that a highly advanced stage of the draining process is necessary to produce malaria, but what that stage is we can-

not determine. Nor can we even tell what that poison is which, varying greatly, according to the temperature elevation, cultivation and depth of the soil, generates typhus, small-pox and other diseases. Dr. Lind considers that it depends on animal and vegetable putrefaction; but M'Culloch says, that it is impossible to know the nature of the miasmatic exhalation.

Physiological condition of the blood during Intermittent Fever.

Generally speaking if the ague is of a simple form the blood is found in its natural state, nor is it changed in quantity, quality, constituents or colour. But when the intermittent fever is accompanied with other diseases such as an affection of the liver or spleen, then we may have the white corpuscles of the blood enlarged in quantity, a result consequent upon the mal-action of the above organs. as we know that the spleen is one of the principal organs in the formation of the blood, so that when we have a diseased spleen the action of that organ being changed,

our blood becomes also abnormal in condition. During Intermittent fever the mucous surfaces of the digestive organs are more or less altered. They may become softened, or be injected with dark blood in patches or spots. Ulceration very seldom occurs in these organs, unless the disease is accompanied with diarrhea or dysentery. The mesenteric glands are very often enlarged. The brain and its membrane are rarely affected, unless there is coma present. Sometimes this disease is accompanied by Pneumonia or Pleurisy, or we may have a dropsical effusion, especially in the peritoneal cavity.

Symptoms

An ague is generally divided into three stages, the cold, the hot, and the sweating. The first stage is marked by the patient sighing, yawning and stretching himself. He soon feels chilly, especially in the back along the course of the spine. He

grows pale and his countenance shrinks. his skin is dry and rough, and he feels very cold, and is obliged to rub himself with the bed-clothes. He shivers over all his body, his teeth chatter, sometimes very loudly. His cheeks, lips, ears, and nails become blue, The respiration is quick and irregular, His pulse is very quick. Severe pains are felt in his head, back and loins. all secretion is diminished. He may make water though generally he voids but little. The tongue is dry and white. He feels as it were a weight upon his chest; and his appetite is impaired.

After the abatement of the symptoms of the first stage those of the second begin to make their appearance. They commence by an increase of heat. A burning heat is felt about the face and temples. Then the whole surface of the patients body gets warm, the capillaries of the skin begin to fill with blood. The face becomes red and rigid and the whole surface of the skin becomes hot and dry. The temples throb

The temperature of the body is increased according to Fordice to about 105°. Dr Macintosh states that he has known the temperature of the body to be as high as 110° in Gt Britain, and 112° in Warm climates. The mouth is hot and dry. the tongue is furred. The patient complains of thirst. The respiration not like what it was in the cold stage is regular. The pulse is full and strong. even more so than it is in health. Secretion is diminished, the skin is hot the urine is scanty, and what is voided is highly coloured. Convulsions sometimes occur during the hot stage, but this is not common, and happens chiefly with young children. The patient may take delirium, but not often. In fine the symptoms of the second stage are mostly those of the first aggravated.

Third Stage. Moisture begins to appear on the forehead and neck. This by degrees becomes a sweat, After a short time it covers the whole body. This sweat continues to flow, the heat of the body abates and the thirst ceases. The duration of this stage is from six to eight hours. If the ague is simple, nothing is to be feared from this stage.

Types.

We have various types of the ague but the principal are the quotidian, Tertian, quartan, semitertian, complicated, and irregular. The interval of the quotidian is about 24 hours. its paroxysm commencing in the morning. It is of less frequent occurrence than any of the other types. and from the similarity of its paroxysms it has little resemblance to the double tertian in which only every alternate paroxysm is alike. The interval of the Tertian ague is about 48 hours. This is the most common type of ague, and is considered the primary type of fever. It is called tertian from happening every 3d day. It makes its appearance about noon, and lasts about seven or eight hours. finishing on the evening of the same day. It is the only type which is to be found in our country. Sometimes we may have another type but very, very, rarely. The interval of the quartan is about 72 hours, and the usual duration of the fit, which generally begins at noon, is under 9 hours. The par-

oxygen is short in this kind of ague and the cold stage of it is the longest.

Ague leaves behind it a strong disposition to reoccur annually, and in all chronic cases it is attended with enlargement of the spleen. This malady prevails during the autumn and the spring. In our country soldiers and sailors are more apt to be attacked by it than civilians. & next to these the peasants are the most liable to be attacked. Adult and young persons are more likely to be attacked than old persons. Females are less liable than males. The middle and lower classes of society are more exposed to this malady than those who move in the higher circles.

Treatment

Before entering on the treatment of this disease, I think it will be as well to speak first of the Prophylactic, or preventive treatment.

Miasmatic districts must be avoided with great care. People should if possible never sleep in the open air. The intense heat of the

Sun in the middle of the day should be shunned. In fact all kinds of excess either of heat or cold must be guarded against. People should be careful never to expose themselves to cold when heated, and never to remain in wet clothes. A sudden alteration in the temperature is very apt to induce the disease. All exciting or predisposing causes must be avoided, Good lodgings, clothes, and diet must be carefully attended to.

In the present state of our knowledge we possess a great number of remedies for intermittent fever; but none superior to Cinchona bark, whose influence over this disease, points it out as one of the most powerful medecines which can be used in its cure. The quantity of Sulphate of Quinine, which is Cinchona in a particular form, recommended to be administered by the practitioner is from 12 to 24 grs. during the paroxysm until it be stopped. The effects of this dose is different in different individuals. Some persons are more easily af-

jected by medicines than others, and in administering them, we must consider the sex, the age, and the constitution. These being taken into account, we may administer the dose with more confidence, and a better chance of success. The next remedy is one which is even preferred by some to the foregoing, viz. Arsenic, which although a virulent poison is of incalculable value in endemic intermittent. — Opium is another remedy for this disease recommended by Dr Lind. — Charcoal is a substance which has been used with great effect in the cure of intermittent fevers, particularly in those patients in whom the disease is accompanied by a great disturbance of the digestive organs, nausea, flatulency, hiccup, diarrhœa, or dysentery.

Chamomile flowers are of great benefit in removing ague; but this is attributable to the piperine contained in them, which was tried by the Italian Physicians, and given in a dose of from 6 to 8 grains with good results. — The preparations of Iron and

zinc are used in this malady. according to Sir Gilbert Blane in the West Indies and London. Sir James Mc Gregor also speaks highly of this remedy. from what he saw of its effects during the Peninsular war.

Willow-Bark is another remedy used in this disease.- Spider-webs are also used according to some American Physicians.

M. G. Dow, attached to the Walcheren expedition, administered 5 grains of sub-carbonate of Ammonia. with an equal quantity of camphor. & a scruple of aromatic confection successfully. Cascarilla Bark and nux vomica are both used in this malady. the latter is especially used when intermittent is accompanied with diarrhoea.

In the cold stage emetics are given at its early approach. Diluent drinks have been recommended. External warmth. & warm or vapour baths are good. The patient should be kept in a warm bed, and have bags of hot salt or bran applied to his epigastrium. A hot-bottle or brick, wrapped up in warm flannel should be applied

to his feet. Blood-letting is used in our own country in the second stage, and it is believed by the common people and physicians that it relieves the patient. According to Dr Machintosh, bleeding in the cold stage arrests the paroxysm and with it the disease, while on the other hand Pringle and Colbingham say that bleeding is a safe and proper practice, in hot climates and warm seasons, rendering the intermission more complete, taking off the inflammatory diathesis which counteracts the beneficial effects of cinchona, and removing the pleuritic and rheumatic effects. and the symptoms of congestion in the brain, spleen, and liver, which are superadded to fevers of endemic origin. Blisters may be used sometimes during the intermission of this malady. Local blood-letting is sometimes used, and this is very often done in hot climates, specially when the disease is accompanied by the enlargement of the spleen or liver. Besides this there is another remedy which is of great use in Tropical climates, and is

used by our Physicians in Egyptian ague, viz. Calomel. — This medicine is given to produce three effects. - First, to calm the irritability of the stomach. Second, to correct and promote the secretion of the intestinal surface of the stomach and intestines, and of the glandular organs, and third to promote an increased action of the great secreting organs. — Cold-water baths are very beneficial in hot countries and warm seasons. I have seen during the hot stage, the patient emersed in cold water and kept for 5 or 10 minutes. When he comes out, he feels great relief, free from headache and with an inclination to sleep. This remedy seems to produce a shock on the nervous system. I hope I may be allowed to state a few facts I have witnessed. A gun was unexpectedly fired off behind a patient and the shock brought him great relief. Had he been aware of what was about to be done it would have had no effect. - In the same way if a person standing beside the patient startles him in any way he brings him great relief.

I have thus endeavoured, as far as possible, to state the causes, symptoms and cures of intermittent fever, and the causes and effects of malaria; but in all the means which may be employed to remedy that fearful malady, it must be remembered that there is One, in whose hands is the disposal of all things. and, that unless His blessing be upon the work, it is vain for poor feeble man to attempt to drive away from his diseased body, any malady which may be sent by the Great Creator of all things.