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I hereby certify that the enclosed thesis on Dysentery has been composed and written by myself for submission to the Medical Faculty of the University of Edinburgh on my becoming a candidate for the degree of Doctor of Medicine, and that I have made dysentery a special subject of study since I received the degree of Bachelor of Medicine

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Dysentery may be defined as "inflammation of the mucous membrane of the colon and rectum, accompanied by fever, nervous depression, griping pains in the abdomen, and frequent alvine evacuations of a slimy and bloody nature passed with straining efforts"

This disease may be broadly divided into the acute and chronic forms. Under acute dysentery are included the mild, sthenic, malarious, and scorbutic forms; and each one of these may pass into the chronic state. Some authors treat of malignant, bilious, and rheumatic dysentery; but never having met with these varieties of the disease, I will not presume to offer any remarks on them.

Causes. There can be but little question that the essential condition productive of dysentery is a malaria, by which I would signify a poisonous vapour evolved by decomposing organic matter, and especially decomposing vegetable matter, in the soil. Impure air and water do undoubtedly propagate this malarious poison; and debauchery, the presence of unwholesome food in the intestines, exposure of the abdomen to cold, &c. may act as exciting causes of the disease in persons exposed to the influence of the malaria; but these must be considered merely as secondary causes.

Dr. Maclean has pointed out that dysentery is a disease prevalent in the tropics simply because few countries there are under proper sanitary supervision, and that just as malaria has been expelled from Britain by improved hygienic measures, so has dysentery declined there both in frequency and virulence.

In Bangkok dysentery is met with in all seasons, no public measures being taken to secure cleanliness; but the cases are most numerous and most severe at the changes of the monsoons. At the beginning of the north-east monsoon, the river is swollen by the heavy rains that have been falling during the south-west monsoon in the northern provinces; and at high tide the water spreads over the whole

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country in the vicinity of the city, leaving at the ebb large quantities of decaying plants on the land. In the months of March, April, and May, when the southwest monsoon is coming on, the ebb tides are so low as to empty most of the numerous canals in Bangkok; and the effluvia that arise from their emptied beds are most offensive. The Siamese well recognise the fact that during those months the "red purging" is caused by the vapours that rise from the muddy soil left exposed to a scorching sun by the ebb tide.

Symptoms.— Mild Acute Dysentery. This form of the disease begins with a chill, followed by slightly increased heat and dryness of skin and accelerated pulse. Then there comes on a sinking feeling in the abdomen, which I have heard patients compare to sensations produced in them by the lurching of a ship. There are at first copious feculent evacuations, passed without much griping and straining, and not always of a very offensive odour. The motions soon become scanty, mucciform, and bloody; they evolve the characteristic dysenteric fetor, and are passed with considerable griping and straining. The tongue is moist, and covered with a thin white fur. The patient seldom makes any complaint of tenderness in the abdomen; but pressure applied in that region will usually elicit from him expressions of pain. From the increase of griping that follows solid food, it is soon avoided, even although the appetite be scarcely impaired, as is frequently the case.

If the patient be properly treated, an attack of mild acute dysentery is almost instantly subdued. The skin is moistened by free perspiration; the urine throws down a red deposit, the evacuations assume a healthy character; and the disease is at an end, leaving the patient in many instances scarcely less vigorous than before his illness. Indeed, if the sufferer will simply take complete rest, and use nourishment of a simple, unirritating nature, in the course of a week or ten days the attack usually passes off in the manner described above. But should the patient flee for relief to the vile brandy or Chinese spirits sold in the East, his

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case will almost infallibly pass into either the sthenic acute or the chronic form.

Sthenic Acute Dysentery. The attack usually begins with the premonitory symptoms of listlessness, general discomfort, and fleeting abdominal pain. Sometimes, however, the disease at once sets in with a rigor, a cold clammy skin, and an intensely disagreeable feeling of hollowness in the abdomen which alarms and depresses the patient. Increased heat and dryness of skin, a rapid weak pulse, and frequently recurring calls to stool, soon follow. After the first two or three evacuations the motions consist only of blood and mucus, and are passed with severe tormina and tenesmus, which latter is in proportion to the extent that the rectum is involved in the disease. In those cases unchecked by treatment the discharges soon become more bloody than mucous, and are so frequent that the patient can scarcely be induced to leave the stool, though he may dread the burning sensation in the anus that so often accompanies each motion of the bowels. Frequently the bladder is intensely irritable, the patient passing a few drops of urine every five or six minutes. At other times the muscular coats of that viscus are in a state of temporary paralysis; and it is necessary to draw off the urine by means of a catheter. From the first there has been tenderness of the abdomen: this region now becomes excessively sensitive, and in many instances, swollen and tense. The tongue, at first moist and covered with a white fur, now takes on a dry appearance, and is either red over its entire surface, or red at the edges with a brown cracked coating in the middle. Should the disease be about to terminate fatally, the stools assume a brownish-red colour, are thin and copious, mingled with shreds of mucous membrane and broken-down smooth muscular fibres: their odour becomes insupportably fetid and penetrating, being detectable at a distance of several hundred yards. Pain now ceases, and the patient will hail this as a favourable sign. Soon, however, a low delirium comes on; the stools are voided unconsciously; there

is hiccup, a feeble, irregular, rapid pulse; and finally stupor and death. If, on the contrary, the affection terminate favourably, it does so in the same manner as mild acute dysentery, viz.— by sweating, less frequent and more natural evacuations, cessation of the tormina and tenesmus, and a red deposit being thrown down by the urine.

Acute Malarious Dysentery. This may be divided into intermittent and remittent. The former I have never met with; but in Bangkok dysentery is but comparatively rarely seen in which the febrile affection is not, at the outset, remittent. Cases of ordinary mild and sthenic acute dysentery I have generally seen in seamen who had recently arrived in port, and in whom the exciting causes had been either debauchery or exposure to the cold night air and dew while asleep. Dysentery in persons, whether native or foreign, who have been for some months resident in Bangkok, almost invariably presents a remittent type of fever in the early stages. I have not, however, been able to detect that the dysenteric symptoms proper exhibit in such cases any periods of exacerbation and remission.

The patient attacked by remittent dysentery suffers, in addition to the symptoms of acute dysentery, severe headache and pain in the loins, occasional sickness, loss of appetite, and often, also, slight delirious attacks. The paroxysms of fever generally last for about six or eight hours; and the remission begins, as a rule, at nine or ten o'clock in the evening, being ushered in by a burst of perspiration. The fever assumes more and more a continued character as the disease advances; and often, even at the first, the remissions are only to be detected by careful observation. In other respects, the course of remittent dysentery is similar to that of the simple acute forms.

Acute Scorbutic Dysentery. This variety of dysentery I have only once seen. The case was that of a seaman who arrived in Bangkok after a ninety-three days' passage from Hongkong, where he had entered him-

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self on the books of his ship three days after his arrival from Hamburg, having made a passage from that port to Hongkong in one hundred and thirteen days. His complexion was sallow, his gums blue, tender and spongy, bleeding when touched. He had numerous petechial patches on his legs; and he suffered from dyspnœa on the slightest exertion. When he arrived in Bangkok, although he suffered from slight diarrhœa, his evacuations were of by no means a dysenteric nature. They consisted of undigested portions of food and a dark-coloured liquid, somewhat sanguineous in appearance; but they were free from dysenteric odour, and there was no febrile disturbance. While under treatment for the scorbutus, acute dysentery set in. In this case the fever was continued; the stools were from the beginning of the attack of an odour more offensive than I have met with in any other instance, and consisted of little else than bright-coloured blood and mucus. The treatment for the scorbutus being reinforced by that for acute dysentery, the patient made a rapid recovery.

Chronic Dysentery. Mild chronic dysentery seems to have attracted but little the attention of practitioners in the East. It is certainly by no means so frequent as the severe form of chronic dysentery; still I have repeatedly met with it among the Siamese half-caste Malays, and I have twice seen it in Europeans. The patient seldom has more than two or three evacuations daily, and these usually take place early in the morning. The first portion passed is thin, bloody, and serous; but the remainder of the stool is, to all appearance, normal. Straining is not great, and occurs only during the first part of the act of defecation.

Properly treated, the patient will soon recover; but, if neglected, the disorder becomes worse and worse until it assumes the characters of the severest form.

The aspect of a sufferer from severe chronic dysentery is truly wretched. Pale, wasted, prematurely old, irritable or sullen, the patient often seems to have given up hope and broods over his miserable condition. The skin

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is dry and harsh; the tongue either slightly furred or red and glazed; the mucous membrane of the mouth, lips, and cheeks pale and anaemic; the pulse frequent and thready, especially towards evening and during the night; and the heat of skin, which may not have been perceptibly greater than what is normal during the day, increases as the pulse rises in frequency. The patient sometimes complains of a perpetual dull aching over the whole belly; but usually there is no tenderness save in the region of the caecum and sigmoid flexure of the colon. In chronic dysentery the alvine discharges are less frequent and more copious than in acute dysentery, and their odour is somewhat different, but not less offensive. In each case that I have seen the stools varied much from day to day both as regards quality and quantity. Sometimes they are abundant and not frequent, passed with violent expulsive efforts and without much straining. In such cases I have always observed them to be semifaeculent, mingled with mucus and serum, and streaked with blood. At other times the dejections are more numerous and less copious, and are voided with painful straining. In these cases they are usually composed of thin serous fluid and bloody coagula. The blood may either be uniformly diffused throughout the discharges or exist separately in the liquid or coagulated state; and on close examination streaks of muco-purulent matter are often to be detected in them. More or less undigested food is always present in the stools of chronic dysentery; and this circumstance accounts for the fact that however keen the patient's appetite may be, he continues to lose flesh while the disease continues.

Crops of boils on the shoulders, thighs, and legs, often spring up in cases of long standing.

Under proper treatment the sufferer will often slowly recover his health; but chronic dysentery, if left to itself, will almost certainly prove fatal, the patient sinking from hectic and irritation or occasionally from syncope. Not unfrequently the feet and legs become oedematous, and even ascites comes on, as the disease nears a fatal termination.

Diagnosis. Dysentery cannot be mistaken for any other disease

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except diarrhœa; and it is mistaken for that complaint only when the evacuations are copious and of a yellow or brown colour. But even in these cases the griping and straining ought to rouse suspicion; and the diagnosis may be rendered certain by washing away the colouring matter of the stools, when flocculi of mucus stained with blood will be left in the vessel. In ordinary acute dysentery the mucous and bloody evacuations accompanied by griping and straining at once point out the nature of the disease. The dysenteric odour, too, can never be mistaken.

The chronic forms of diarrhœa and of dysentery are often difficult to distinguish by regarding only the appearance of the evacuations. Apart from the history of the case, however, although blood may be found in the stools of sufferers from either disease, in chronic diarrhœa it has undergone greater change than in chronic dysentery, the bright scarlet tint never being seen in the former affection. Then, too, the peculiar cadaveric smell is always more or less detectable in the motions of chronic dysentery; and this is of itself sufficient to establish a correct diagnosis.

Morbid Anatomy. In my own experience I have met with but two deaths from dysentery, and in neither case was a post-mortem examination permitted. I can, therefore, offer no original remarks on the subject.

From Dr. Maclean's article on dysentery in Reynolds' System of Medicine I learn that in the early stages of the disease, before ulceration has set in, portions of the mucous membrane of the colon and rectum are seen to be swollen and softened, and exhibit a rosy, purplish, or brown discoloration. The amount of swelling, softening, and discoloration, varies much in different parts of the bowel. From the beginning of the affection the solitary glands were observed by Dr. Parkes to be enlarged in various degrees, being distended by exudate, and surrounded by a circle of congested capillaries. Usually in the glands themselves, but occasionally in the surrounding tissue, ulceration begins. Dr. Maclean believes that in the rapidly destructive sloughing form of dysentery, the morbid

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process begins by diffuse submucous purulent effusion detaching the mucous membrane, which rapidly becomes gangrenous, its vascular supply being thus cut off.

A process of exudation begins at first in the solitary glands, but soon extends itself to the Lieberkühnian crypts, and spreads over portions of the mucous membrane. I have sometimes seen this exudate expelled in fragments with severe griping and straining efforts; and I have then been able to verify the observation that it consists of columnar epithelial scales in a granular fibrinous matrix. At other times, the exudate having become in some measure organized, it separates by ulceration in tubular portions. In the instances where I have seen the latter process, it was invariably accompanied by smart haemorrhage. Microscopic examination of the exudate in such cases discloses the fact that loops of bloodvessels have begun to pass into it from the mucous membrane. The fibrinous matrix, too, is denser than when mere fragments of the exudate are voided. In chronic dysentery the exudate is in many cases found to have undergone ulceration like the natural tissues.

Contrary to the general opinion of practitioners, it would appear that the symptoms in chronic dysentery are not invariably due to the presence of uncicatrized ulcers in the bowels. Frequently, though there may be numerous cicatrices, indicating ulceration at one period of the disease, there is not a single unhealed ulcer to be found in the whole intestinal tract. In these cases the mucous membrane is infiltrated with a black granular substance, which Dr. Ritken believes to be extravasated blood undergoing decomposition. But in other cases ulceration is found in all its stages, and the bowel in a state of extreme atrophy.

The earlier stages of chronic dysentery show great exudation of lymph into and between the intestinal coats; and when the patient is much wasted, the colon may be felt like a hard cylinder through the walls of the abdomen.

Complications. The most common complication of dysentery in the

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Siamese and Chinese races is enlargement and softening of the spleen; but the symptoms of the intestinal affection when thus complicated are not in any degree different from those of the simple form. Among Europeans and Americans who have lived long in Siam, a case of dysentery is seldom seen in which the liver is not more or less affected with congestion or inflammation. I have never, however, been able to diagnose abscess of the liver complicating dysentery in natives either of the East or of the West. When abscesses of the liver do occur as a complication of dysentery, they are usually, if not always, small and multiple. In those instances where dysentery is complicated with hepatic congestion or inflammation, superadded to the symptoms of intestinal disorder we have the usual tenderness over the liver, pain in the shoulder, sallow skin, and yellow conjunctiva.

Scorbutic dysentery cannot be considered as other than simple dysentery complicated with scurvy.

Prognosis. So far as my own experience goes, the only ground for anticipating a fatal result in acute dysentery is the sudden cessation of pain, followed by the copious, brownish-red, intensely foetid stools. I have seen many instances where there was great nervous depression with an extremely weak and rapid pulse, and where the urinary bladder had to be emptied by means of a catheter, that nevertheless went on to a favourable termination under treatment; and I cannot, therefore, regard these symptoms as particularly alarming.

In mild chronic dysentery the prognosis is always favourable; this form of the disease yielding most satisfactorily to proper treatment.

The prognosis in severe chronic dysentery is eminently unfavourable when there is a large proportion of blood and undigested food in the dejections, and is favourable in proportion as the stools are feculent and free from blood and undigested food.

Treatment. Perhaps there is no disease that demands more prompt treatment than does dysentery. Left to itself, it will almost infallibly

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destroy the patient either in the acute or chronic stage

Both in mild and sthenic acute dysentery I have the greatest confidence in the use of the hot vapour bath as the first step in treatment. The patient is placed in a basket chair below which there is an evaporating basin of water kept at the boiling point by means of a spirit lamp. A blanket envelops the whole of the chair and all of the patient but his face. Copious perspiration invariably comes on in from five to fifteen minutes, when the patient is thoroughly and rapidly dried and put to bed. Thirty grains of ipecacuanha with twenty minims of laudanum are then given either in about two drachms of water or the same quantity of tincture of calumba or compound tincture of cardamoms. A sinapism is at the same time placed over the entire surface of the patients abdomen; and he is directed to keep lying on his back with his head and shoulders well raised. He must abstain from all solid or liquid food for at least three hours after this: simple and nutritious food must then be given, such as sweet milk, soft-boiled eggs, beef- or chicken-tea prepared cold according to Liebig's process; and in four hours after taking this nourishment the treatment by medicine must be resumed as before.

This treatment I have never known to fail of success when it has been adopted from the beginning of the attack. Free action of the skin and feculent evacuations passed without griping and straining are almost always obtained after two or three doses of ipecacuanha have been kept down. After this result, I continue for some days to administer ipecacuanha twice or three times during the twenty-four hours, but only in doses of ten grains with an equal quantity of subnitrate of bismuth

Should the ipecacuanha cause troublesome vomiting in the large doses given at the beginning of the treatment, I at once proceed to place the patient under the influence of quinine, giving twenty grains dissolved by the aid of diluted nitric acid for the first dose, and repeating it in doses of ten grains every two hours until the characteristic effects of

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cinchonism are produced. This done, it is rare indeed that the ipecacuanha causes much uneasiness if given with the adjuncts I have mentioned and the patient retain the posture recommended.

In malarious dysentery there is great intolerance of ipecacuanha until the patient is cinchonized; but this once accomplished, the results are scarcely less satisfactory than in ordinary acute dysentery.

Scorbutic dysentery must be treated with fresh fruit and vegetables as well as with ipecacuanha. Indeed it is said that the use of a fresh vegetable diet is of itself sufficient to effect a cure in many cases of this form of the disease. But in the only case of acute dysentery that I have seen complicated with a scorbutic taint I employed the ipecacuanha treatment also, and I had no reason to regret having done so.

When dysentery has lapsed into the chronic state, treatment is by no means productive of as happy results as in the acute stage. Still, we are fortunate enough in many instances to be able to restore the patient to health by judicious dietetic and medicinal treatment. Ipecacuanha in the same large doses recommended in acute dysentery now and then proves eminently successful. This is generally the case in the mild chronic form, and in the severe chronic form when the disorder temporarily assumes a subacute character. Solution of the pernitrate of iron, as recommended by W. Maclean, will frequently exercise a truly marvellous influence on chronic dysentery. I give it in doses of fifteen minims with two grains of sulphate of quinine three or four times daily. Under its use the quantity of undigested food in the evacuations often diminishes, they assume a more normal appearance, and colour shows itself in the blanched cheek of the sufferer. Unfortunately, it is by no means rare to find that the patient vomits his dose of iron almost immediately, whether quinine be added to it or not. Under such circumstances, great benefit may be obtained by the administration of nitrate of silver in quarter-grain doses with one grain of opium and ten grains of subnitrate of bismuth. Injections into the bowel of a solution of nitrate of silver containing five grains in each ounce sometimes act like a charm.

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In all the forms of dysentery the food should be as nutritious as possible, and at the same time easily digestible. Raw eggs switched up with sweet milk and sugar and a little good brandy or liqueur form a food which is always grateful to the sufferer from this disease. It must be cautioned, however, against drinking it off as a beverage, and enjoined to sip it slowly, keeping it for some seconds in the mouth and allowing it to be mixed with saliva before swallowing it. This diet may be agreeably varied by beef-, mutton-, or chicken-tea, which I always advise to be prepared cold in the manner recommended by Liebig. The patient should not be allowed to return to solid food until he can be pronounced fairly out of danger; and he should resume it gradually, taking care that every morsel is thoroughly masticated.

A flannel belt should be worn over the abdomen by every western resident in the East; and this is to be particularly impressed upon the sufferer or convalescent from dysentery.

When there is scalding at the anus, great and immediate relief is afforded by the use of an ointment of belladonna and tannin.

The therapeutic value of ipecacuanha in dysentery has been variously ascribed to its emetic, laxative, and diaphoretic properties. It is, however, the desire of every practitioner in treating dysentery with this drug to prevent its acting as an emetic; and while it does now and then exercise a purgative action, this is a comparatively rare occurrence, and is by no means desirable. Dr. Warburton Begbie's opinion that its virtue depends on the influence it has on the secerning function of the liver seems to me much nearer the truth. The true dysenteric stool I have always observed to be singularly free from bile; and the absence of this natural deodorizer of the faeces accounts for some part, at least, of the fetid odour evolved by dysenteric dejections. Now the effect in dysentery of even one large retained dose of ipecacuanha is the production of an evacuation or evacuations at once bile-stained and less fetid, which I think is conclusive proof that it is in a great measure by acting on the liver that ipecacuanha effects cures in this malady.

Thesis on Dysentery,

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Examined & Sanctioned as Report on Satisfactory

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