

## History of Medicine

# David Livingstone — As I See Him Now

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### INTRODUCTION

If one were to look at the map of Africa as it was in 1841 when Livingstone first arrived at Kuruman, and then again after his death in 1873, one would be struck by the new pathways extending into the interior from Luanda to Quilimane and from Kuruman to the Congo. Such a vast terrain was brought to the notice of the outside world directly and indirectly through Livingstone's explorations. The concentration of Christian missionary endeavours in the 1870s and 1880s, followed by British political influence over this territory, can all be associated with this man. We ask ourselves what exactly did he mean to do? What was his object in moving across Africa in the way he did? Surely if he had been simply a contented missionary doctor, was there not enough room for him at Kuruman or somewhere in Bechuanaland to spread the gospel and heal the sick? Why was it necessary for him to leave Bechuanaland and move as far as the Zambesi, and then to wander around from about 1853 until his death in 1873?

He seems to have been happy enough to persuade others to settle at various mission stations, such as at Inyati in 1859 and at Magomero in July 1861. He encouraged James Stewart to start in the Lake Nyasa region, yet when he returned to Africa in 1866, he did not come out as a missionary but to continue his explorations. Was he simply desirous of spreading the gospel or might he not have been a type of Victorian empire builder interested in Christianity as well? When he first came to Africa he was imbued with a keen Christian desire to convert and serve the heathen. Conscious of Afrikaner opposition to him and his missionary work, and perhaps disappointment with the Bechuana, might have induced him to look northwards from whence he had heard rumours of the great Chief Sebituane and his big nation. This may have influenced him to go there to found a mission in a healthy spot among these people. But even in his early days in Botswana, he seemed to move around rather more than necessary. One might expect his undertaking the 700-mile exploratory journey among the Bechuana in July 1841, and perhaps again in February the next year, when he set out a second

time. A year later, however, in February 1843, he journeyed to meet Sechele, chief of the Bakwena, and in June the same year received permission to establish a mission north of Kuruman. That year he moved out again to investigate a site for his mission at Mabotsa among the Bakatla and was given land there. The following year, he moved again to the Chonuane mission, 40 miles north of Mabotsa, in Chief Sechele's country. For the next two years, however, he still travelled around the country. In 1847 he moved to Kolobeng and then went on a journey with Oswell and Murray into the Kalahari to discover Lake Ngami in 1849. From Kolobeng he decided to reach Sebituane in Makololo country (Barotseland), and from then onwards until 1852 he moved backwards and forwards between Kolobeng and Makololo country. In his writings we read that his object in leaving Bechuanaland was simply to start a station among the Makololo, but, as this would require easy communication with the sea in order to maintain supplies for the mission, he set out to find one from which the sea could readily be reached. Since he considered the south unsuitable on account of the hostility of the Boers, he looked for a route to the sea to the east or west. Not being impressed with the west coast route, he decided to go down the Zambesi to the east. It seemed that he considered this the more likely way.

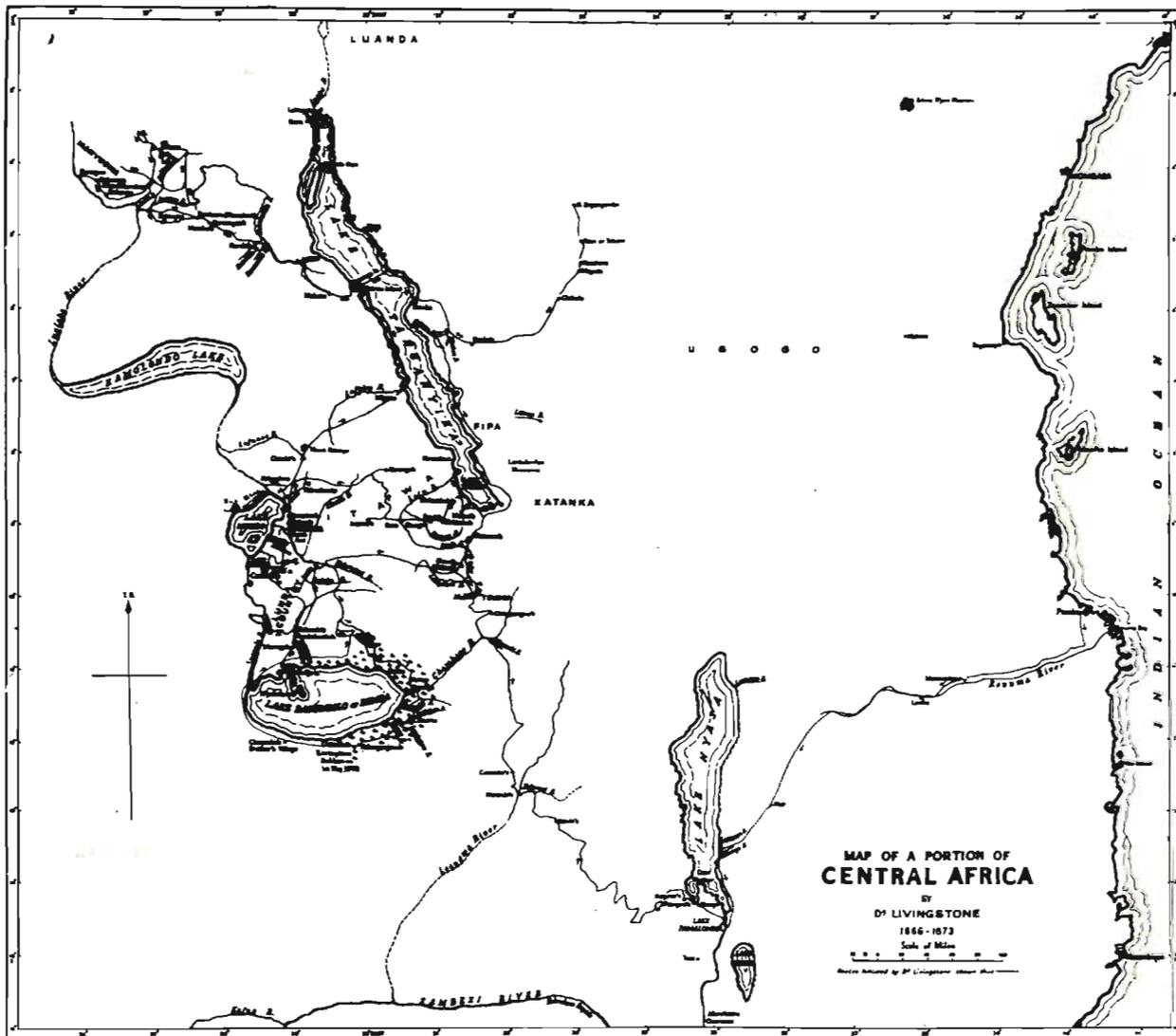
### EARLY BACKGROUND

His early background is of great importance in understanding his make-up. He was born at Blantyre, 7 miles from Glasgow, on 19 March 1813. He was brought up with a deeply religious background. Poverty was a striking feature of his early days, and he quickly learnt to be industrious and thrifty. At the age of 10 years, he worked in a cotton factory and went to Latin classes at night. He developed an interest in botany and used to search for botanical specimens. At the age of 20 years, he consecrated his life to God and decided to become a medical missionary in China. He never drank any alcohol. He left Blantyre in 1836 to go to Anderson's College in Glasgow. In his second year there, he made up his mind to join the London Missionary Society, and in September 1838, after 2 years studying medicine, went to London for a 3-month probationary course at Ongar in Essex. Already his restlessness was apparent. There he had to prepare and deliver sermons as part of the course. One Sunday he could not remember what he had prepared, and as a result the Board almost refused his application to join the Society, but agreed to give him another chance. This time he was able to satisfy those training him, and was accepted. He asked to be

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allowed to finish his medical training, and in July 1839 they agreed in order to fit him for service in South Africa or the South Seas. Then followed a happy year in London with Risdon Bennett at Charing Cross and Moorlands hospitals. About this time he met Robert Moffat who excited his interest in South Africa.

In November 1840, he went to Glasgow to obtain the licentiate of the Faculty of Physicians and Surgeons of Glasgow, which was cheaper than the London conjoint. Again he nearly failed the examination, this time on account of an argument he had had with an examiner concerning the merits of the stethoscope, which was just coming into use. Livingstone was in favour of it and he was not going to be put off for reasons of expediency once he had made up his mind about it.

One of the reasons for his popularity among the natives was his readiness to supply them with medicine (and gunpowder) wherever he went. He showed respect for their doctors, never belittling them, and his medical practice was always popular. He was always willing to try new methods. At Kuruman in 1841, he began obstetrics and removed tumours surgically, and as early as 1852, he used the

clinical thermometer. He was observant too. In 1850 he noticed the relationship between the tampon (a tick) and relapsing fever.

His restlessness and determination were soon evident in Africa where he quickly came into conflict with the Boers and started to travel. Once he was faced with a problem he simply had to find an answer. Even in Bechuanaland, with no-one to advise him, when he realised he had to find the answer to the problem of treating malaria, he did not let it baffle him, but read about the experiences of others and puzzled over the symptoms they described until he worked out his famous 'Livingstone pill'.

In 1853, when he arrived in Linyanti, a new chapter started in his life. Until then, for nearly 13 years he had wandered around in Bechuanaland, and from then onwards he was constantly moving. In 1853 he travelled from Linyanti to the West Coast. On his way to Luanda he noticed the visual defects in Africans in Angola who lived on a predominantly cereal diet, and was thus among the first to draw attention to malnutrition in relation to disease. From Luanda he returned to Linyanti in September 1855, and then reached Quilimane on the East Coast in May



Fig. 1. The Cabora Bassa Rapids on the Zambesi River.

1856, having discovered the Victoria Falls the previous November. He returned to Britain after that for a short time.

He arrived in England, pleased that he had kept his plan of opening up a way to the sea from his healthy locality on the Batoka plateau north of the Zambesi, where he was going to start his mission. However, at this stage he was beginning to talk about commerce, civilisation and Christianity, which would rescue Africa from slavery.

By this time he was regarded as a great explorer, and had become a national hero in the UK. Sir Roderick Murchison, President of the Royal Geographical Society, suggested that he undertake an exploratory expedition of the Zambesi area, and paved the way for him to see the Earl of Clarendon of the Foreign Office, to whom Livingstone confided his plan of opening up the Zambesi to introduce commerce into the interior, and of ending the traffic in slaves through legitimate trade. Cotton could be grown there, he said, and, since the Portuguese controlled only the coastal belt, he was sure his travelling in the interior would not upset them.

He had not as yet finally broken with the London Mission Society, who were interested in his suggestion that they should start missions among the Makololo (Sekuletu's country). These people could be moved away from the river to higher ground where it was more healthy. The Directors of the Society would have liked Livingstone to take an active part in this, but he refused. He was willing to organise the missions, but not to work there himself. His own plans for opening up Africa were not quite what the Society wanted from their missionaries. Although he still spoke about the cause of Christ, the Directors were not convinced that the little preaching he managed on his travels was helping to spread the gospel. So it was not surprising that he resigned from their service. He gave John Moffat £500 for the mission he was about to start in Inyati, an ox wagon, and £150 per annum for life to be used towards his work with the Matabele or Makololo.

About this time came the offer from the British Government to finance an expedition headed by Livingstone to open up the Zambesi. When negotiating with the Earl of Clarendon, Livingstone was very careful to play down any fear of upsetting the Portuguese. He said that the 'enlightened governments of England and Portugal should unite in an attempt to open up South Central Africa to the commerce of the world'. The establishment of trading posts on the upper Zambesi could be a combined effort by the two governments. This is in sharp contrast with his actions a few years later, when he tried to find a route to Lake Nyasa along the Rovuma River in order to circumvent the Portuguese. His scheme for exploring the Zambesi was approved by the Foreign Office, and their decision was brought before the House of Commons. The Earl of Clarendon, however, was probably not deceived, and hoped that the results of this expedition might lead to important commercial consequences, especially in the cultivation of cotton.

After his famous lecture at Cambridge in 1857, Livingstone returned to Africa, no longer as a missionary, but as Her Majesty's Consul at Quilimane for the Eastern Coast and Independent Districts of the Interior and Commander of an expedition to explore Eastern and Central Africa (1858). He was the leader of the expedition with Naval Officer Commander Bedingfeld as commander of the vessel, John Kirk (botanist and medical officer), Charles Livingstone (general assistant moral agent), Thomas Baines (artist and storekeeper), George Rae (the ship's engineer) and Richard Thornton (the geologist). In May 1858, he arrived at the mouth of the Zambesi with his expedition. There he was to look into the Zambesi trade routes for Britain, and possible settlement of the English.

This is perhaps the most revealing part of his career. Although he was still imbued with the idea of furthering Christianity, he had a new theme, a mixture of Christianity and British colonial settlement — opening Africa for

British trade — and, not so vociferously of course, ousting the Portuguese.

Again his obstinacy was most evident. When he moved up the Zambesi with his expedition, he found his way barred by the impassable Cabora Bassa Rapids. He had already heard about them, but was determined to see for himself, quite sure that they were only two small rapids on the river. The first time he reached these huge rocks, he still would not believe his own eyes. He was certain that when the river was higher, he would be able to take a ship across them. Soon afterwards, he came back and realised this plan was doomed, but returned a third time (so typical of a person with an obsessional neurosis), just to make sure that he had not been mistaken.

He thought the Portuguese were decadent because of their slave trade activities, and he was not impressed with what he had seen in Mozambique and Angola. The Portuguese were aware of what was going on, and did not react favourably to Livingstone's criticisms. Their officials were uneasy about this so-called missionary travelling round in the interior, believing he was not just an evangelist but a colonial politician, with his ideas of trade and settlement, running down the slave trade. It was very likely, they thought, that he might even attempt to deprive Portugal of her colonies.

Livingstone hoped the Portuguese would not claim the healthy interior (now Zambia), which there is little doubt he wanted for Britain. Professor Sedgwick of Cambridge quoted a letter in the Rhodes Livingstone Museum, in which Livingstone hoped that this expedition 'may result in an English Colony in the Healthy Highlands of Central Africa, (I have told it only to the Duke of Argyll).' He was a little chary, perhaps, of telling his ideas to the British Government at this stage, hoping to persuade them later, after they had become more involved. He did not think much of the Boers or Portuguese as colonists, believing Britain to be more suitable to occupy these territories. Martelli says that he deliberately deceived both the Portuguese and his own government. It is likely, however, that the Foreign Office was well aware of the delicate situation he was creating, but, at the time when Empires were considered so desirable, they were probably also tempted.

The British Government had suggested making him Consul for Quilimane, Senna and Tete, but the Portuguese refused to accept this, agreeing only to his being Consul at Quelimane. Obviously they did not regard the Zambesi as a free waterway, and even though they allowed him to ascend the river, they watched him very carefully. Most revealing is his intention in this passage written in his journal before he left England on his mission in 1858: 'It is the mission of England to colonise and plant her Christianity with her sons on the broad earth which the Lord has given to the children of men. I am now working out the problem of a way into the interior healthy highlands.'

His expedition was planned with the meticulous care and minute detail that he devoted to all his ventures. He discussed in extraordinary detail with Kirk, the malarial treatment he wished to be followed, and arranged for everyone

to receive quinine in wine from the time when they came to the river. He would permit no deviation from his orders, and when he discovered that Captain Bedingfeld was not taking his quinine, he was furious and dismissed him instantly. He might not go down in the annals of history as a great physician, but had it not been for his management of attacks of malaria, he would have shared the fate of those who attempted to penetrate these unhealthy regions before him. The Zambesi Expedition of 1858-1863 would have ended in disaster had it not been for his control of the malaria.

When still at Kuruman, hearing about the great tribe under Sebituane, who lived further north in a most unhealthy fever-ridden belt 200 miles north of Lake Ngami, he made up his mind that he would like to found a mission in these parts, but it could never be a reality unless it were in a healthy place. So he thought deeply and devised a method of treating the fever. Although he personally did not succeed in establishing his healthy mission to the north, he paved the way for others by proving that, with the proper use of quinine, the White man could survive. While practising in Southern Botswana, he read avidly, and regularly received the *British and Foreign Medical Review* and the *Lancet* which Robert Moffat had ordered.

Since he was so engrossed with the fever belt beyond Lake Ngami, it could not have been mere coincidence that he obtained a copy of the *Medical History of the Expedition to the Niger during the years 1841-1842*, by James Ormiston McWilliam, the Medical Officer in charge of the expedition. McWilliam mentioned his medical findings, which probably led to the failure of the expedition. His method of administering quinine left much to be desired, for it was generally withheld until late in the course of the illness. This Livingstone must have noticed. McWilliam also gave details of the 8 autopsies performed. All these patients died of malaria, and he observed that in 3, the gall bladder was distended with bile, 'of the colour and consistency of tar'. This made a deep impression on Livingstone, and caused him to prepare his famous pill of quinine and purgatives to rid the system of bile.

He felt it was most important to find a remedy for the fever before he left for Sebituane's country. On 10 August he visited Lake Ngami and the Zougga River to see Lechualatebe, and to ask for guides to accompany him to the Makololo Chief. He was prepared for any attack of fever that he might contract on his journey. He would take quinine as soon as symptoms appeared, together with strong purgatives to rid the liver of its excessive bile. This would be followed up with large doses of quinine until the ears rang. Unfortunately he could not go beyond the Zougga River, since he was not able to obtain guides, and consequently he did not have a chance of trying out his treatment.

He returned to Kolobeng, where he remained until April 1850, when he left again for Sebituane's, this time taking his wife and three children with him. On his way he heard that a party of Englishmen, who had gone to the lake in search of ivory, were all laid low with fever and that one of them, Alfred Rider, had died of it. He reached Lechualatebe and arranged with him for guides to take him to Sebituane on ox-back, while his family would wait

for him at Lake Ngami. When all was ready for his departure, his little boy and girl were seized with fever and the next day all the servants developed the same complaint. He was thus forced to give up his plan to go to Sebituane that year. He now had the opportunity of trying out his remedy and all his patients recovered rapidly. He noticed that the fever responded immediately to quinine.

In 1851, when he reached Linyanti, Sebituane's capital, with his family, Livingstone was in no doubt as to the virulence of the fever there. His attention was drawn to the fact that the majority of the people who Sebituane had brought into these parts were much more affected by it than the indigenous or 'river races', the inhabitants of the country. Here he offered himself as 'a forlorn hope to ascertain whether there is a place fit to be a sanatorium for more unhealthy spots'.<sup>3</sup> Instead of again exposing his family to these unhealthy regions, Livingstone decided to send them back to England before he set out on his second journey to Linyanti in 1852.

Sebituane had died when he was there in 1851, so Livingstone went to see Chief Sekeletu, his successor. Although he had tried out his remedy at Lake Ngami and had been satisfied with it, Livingstone still appreciated that there might be an even better one which he was prepared to use if it became available. Even if it came from a witch-doctor, he would have no qualms about trying it. He was a man with an open mind and respect for the ideas of others, so that when he had his first attack of fever on 30 May 1853 at Linyanti, and then relapsed on 2 June, he submitted to a trial with an unorthodox remedy. He wrote, 'Anxious to ascertain whether the natives possessed the knowledge of any remedy of which we were ignorant, I requested the assistance of one of Sekeletu's doctors. He put some roots into a pot with water, and when it was boiling, placed it on a spot beneath blankets thrown around both me and it. This provided no immediate effect; he then got a small bundle of different kinds of medicinal woods, and burning them in a potsherd nearby to us, he used the smoke and hot vapour arising from them as an auxiliary to the other in causing diaphoresis. I fondly hoped that they had a more potent remedy than our medicines afford; but after being stewed in their vapour baths, smoked like a red herring over green twigs, and charmed *secundum artem*, I concluded that I could cure the fever more quickly than they could.'

Armed with his quinine and antimalarial pills, Livingstone left Linyanti in 1853 *en route* for the nearest coast to find out how easy it would be to reach the sea for supplies if he were to set up a mission in a healthy spot in these regions. He reached the West Coast, and then, dissatisfied with that route, he returned to Makololo country and from there set off to Tete and the East Coast, roughly following the course of the Zambesi River. He thus crossed Africa from west to east, but not without suffering severely and repeatedly from acute pyrexial bouts of malaria. However, he always took his quinine and as soon as a paroxysm was over, he struggled on with his journey.

By the time he returned to Sekeletu, he was able to throw off each attack with increasing ease, owing to the resistance his body was building up to the various strains of malaria. He was becoming what was often referred to

in later years as 'salted'. With his quinine salt and relative care he was able to overcome the attacks of malaria regularly, although he still ran the risk of contracting black-water fever, which, somehow, he escaped, and which was not yet realised to be a complication of malaria. He tells us on many occasions of the prescription he used. First of all he prepared the pill, which became known as the 'Livingstone pill'. For an adult, 'take resin of jalap and of calomel, of each 8 grains; of quinine and rhubarb, of each 4 grains. Mix them all together in a mortar and preserve for use. When required, make the mixture into pills with the spirit of cardamoms. Dose from 10 to 20 grains. The operation of this dose in from four to six hours removes all the violent symptoms as racking pains in the head, back and loins, and all the bones, dry skin, thirst, etc. If this time passes, a dessertspoon of salts promotes the operation. Then quinine in four to six grain doses every two or three hours till the ears ring or deafness ensues, completes the cure, without, in general, any loss of strength being sustained . . . with it fever is not worse than a cold!!'

When he was making arrangements for his Zambesi expedition with the Foreign Office, Livingstone had already learned of the medical findings of the 1854 Niger expedition under Dr William Baikie. It will be recalled how heavy was the loss of life from malaria in the 1841 - 1842 expedition. A naval medical officer, Alexander Bryson, had found that malaria could be prevented by serving daily amounts of quinine bark in wine to men serving in tropical climates; thus in the 1854 expedition Baikie issued prophylactic quinine to all his men. As a result, the expedition remained on the Niger River for 4 months without a single White death.

Livingstone was confident he could cure the fever. Perhaps he could prevent it; so he instructed Kirk that before they entered the Delta of the Zambesi, all Whites were to be given two grains of quinine in sherry every day. He left no stone unturned and paid attention even to the smallest detail in order to ensure that his expedition reached the mouth of the Zambesi in the dry, more healthy season. They arrived there on 6 May 1858, and from 11 May the men were issued with quinine in sherry each day. The health of the men was excellent at first while they were in the lower river, and Commander Bedingfeld, the Naval Officer in Charge of the steam launch, *Ma-Robert*, appeared to be critical of the fuss Livingstone made about malaria. But at this time the weather was almost temperate.

Things soon changed. When the men reached Expedition Island, a few miles up the Zambesi, fever appeared, and at times Baines was delirious with it. Livingstone himself was beginning to doubt the value of prophylactic quinine, but no-one can be certain that the men really took it as ordered, for, by July, Livingstone and Bedingfeld were at loggerheads. More than one factor was responsible for this, but it is interesting that one of the reasons advanced by Livingstone for their quarrel that led to Bedingfeld's resignation was that he refused to take his prophylactic quinine.

There is no doubt that the Livingstone regimen saved the men and the expedition, for whenever the fever appeared, large amounts of quinine were given early. 'Quinine', Livingstone wrote, 'has a good and prompt effect in all

cases if used with other remedies and in sufficient quantities. I took about 30 grains in six hours and it made me deaf soon after.' By March 1859, after a whole rainy season in the lower Zambesi, Livingstone and Kirk considered that it was time to make an official report on the African fever. They submitted a despatch on it to Sir James Clark, referring to the quinine which was taken regularly by all the Whites with a single exception (Bedingfeld). Two grains were taken in sherry every day and the writers were disposed to attribute their tolerance to malaria to the prophylactic which had been praised for its efficiency on the Niger River in 1854. They proudly quoted in their despatch the following figures for sickness on the expedition. No case of sickness occurred in the lower part of the delta among 10 officers, 37 seamen and 12 crewmen. Anyone who developed fever was cured by the Livingstone regimen and his convalescence was rapid. They concluded that the fever was only formidable when allowed to go on unchecked.

Although bitterly disappointed and irritable after his failure to cross the Cabora Bassa Cataracts, Livingstone was even more determined than ever to find a river route into the interior. In spite of taking preventive quinine, he and his men were all far from well, and since, in any case, he was not easy to get on with, human relationships in the party were deteriorating rapidly. The morale of everyone was low. Livingstone therefore decided to explore the Shire river, because that might provide an easier route into the interior than the Zambesi. In January 1859 he entered this river but soon came up against the Murchison Cataracts, which he named after his sponsor. Again he was disappointed, but did not show his feelings. Also he had learnt of the existence of two inland lakes not far distant and was convinced that from the larger, there was bound to be an outlet to the sea. He returned to the *Ma-Robert* and wrote a despatch to the Foreign Secretary, the Earl of Malmesbury, on 4 March 1859, telling him that these healthy highlands should be of great value, and suggesting that England start a small colony beyond the Portuguese sphere of influence.

He reached the Shire again that month, and this time discovered Lake Shirwa and Mount Zomba in April. He was delighted with this elevated, healthy fertile land, about 3 500 feet above sea level. Both he and Kirk moved freely there without contracting fever.

They came to the conclusion that there were two strains of malaria. There was the milder form existing in the high plateau, in contrast to the deadly, severe form in the mangrove swamps of the Zambesi. Whichever type became established had a tendency to recur. On their return to the *Ma-Robert* they found Walker, one of the crew, severely ill with malaria. This puzzled Livingstone since Walker had taken his preventive quinine regularly. He decided that Walker had not taken sufficient exercise while he and Kirk were on shore, and on this inadequate evidence, abandoned the prophylactic quinine temporarily. But when fever broke out severely among the crew on the *Pioneer* in 1861, as it ploughed its way through the Elephant Marshes of the Shire, Livingstone reinstated its use.

Although he was glad that he had discovered the country for which he had looked for such a long time, he

realised that he had awakened the jealousy of the Portuguese. By this time he was faced with difficulties with his men. Firstly he dismissed Thornton for laziness, and then, on his brother's evidence, charged Thomas Baines with 'skylarking with the Portuguese and giving them large quantities of the expedition's stores. This high-handed action resulted in great acrimony towards him by modern writers. It is possible that both these men, so exhausted by fever, had been inefficient, but Livingstone made no allowance for their plight.

Late in 1859 he sailed up the Shire a third time and discovered Lake Nyasa. He was charmed with this healthy, fertile land, considering it far better than the Batoka plateau. Again he wrote to the British Government about settling her people there. This time he spoke about how much it would help the English working-class; cotton could be grown to feed the cotton mills of Britain. The only obstruction to his plans was Portugal; the Portuguese were now putting up a customs house at the Kongone Mouth (off the Zambesi), which made him all the more determined to find an outlet to the sea from the lake itself.

He decided he would need a boat further up the Shire to take British colonists from above the cataracts to the lake. If a vessel were left beyond the Murchison Cataracts to sail up and down to the lake, there would be adequate communication with the land around it. He was becoming more and more colonial-minded. Now his ideas seemed to centre around colonisation. He wanted people to come out from overpopulated Britain to underpopulated Africa, where he said there was room for 'these emigrants to settle and work the virgin soil'. He felt that both English and Africans would benefit. The latter would find wholesome employment instead of being enslaved, and there was 'room for all in the glorious domain of the Lord, King of the Earth.'

Livingstone was now fairly well off with the royalties he had earned on his books. His first one brought in £12 000 (R24 000). He was happy to use his own money to further his great plans. He gave £6 000 (R12 000) to his children, and with some of the rest, ordered the *Lady Nyassa*, a steamboat, to launch on the lake.

After his famous speech at Cambridge University, and the decision to set up the UMCA mission, the first party of missionaries was ready to come out to Central Africa, and Livingstone had arranged to escort the new arrivals to a suitable spot to set up a station. While waiting for them and for his steamship to arrive, as might be expected, he was on the move again.

When he had come east from Linyanti he had brought with him 120 Makololo to act as porters, and had left them at Tete after promising to take them home again. He had not forgotten his promise, and this was a suitable opportunity. He took them back to Sekeletu's country, where he heard about the fateful Helmore Price expedition.

Despite his frequent writings in medical journals, the missionaries were slow to accept his advice. At times they even neglected it. This could be said of the Helmore Price expedition, for, as soon as the missionaries and their families settled at Linyanti, described by Livingstone as

a most unhealthy spot, they became ill with malaria. They were so ill that in the course of 11 months, 6 out of 9 Whites died of the acute form of the disease. The mission was abandoned and the Reverend Price and the 2 other survivors escaped from there.

So when Livingstone and Kirk reached Linyanti in 1860 and learned of the disastrous start of this mission, Livingstone was greatly distressed. He was surprised that no attempt had been made by the members of the mission to treat the fever according to his earlier writings. He was so upset that he sent a special despatch to Lord John Russell, again giving details of his regimen for malaria. It seems surprising that, knowing how deadly the fever was in these parts, the first missionaries failed to take precautions to protect themselves after choosing to work in such unhealthy regions.

After an absence of 6 months, Livingstone arrived back at the coast to wait for the UMCA missionaries. There he found the *Pioneer*, which had been sent out to replace the *Ma-Robert*, on which he had sailed since the beginning of the expedition. The missionaries arrived, but their doctor had not yet joined them. Although warned by the Navy that his efforts would be in vain, Livingstone not only insisted on an exploratory journey up the Rovuma, but on taking the missionaries with him. The river was so full of rocks that he had to turn back.

He now escorted the missionaries up the Shire, anchoring at Chibisa at the foot of the Murchison Cataracts, full of excitement now that the highlands were to be occupied at last. The mission started at Magomero, the site chosen by Livingstone as a healthy one, but it was not a success. Bishop MacKenzie, the head of the mission, became involved with the local population and their rivalries and wars, supporting one faction against another, and rescuing slaves. He did not take the fever as seriously as he might, being a layman, and by the time the doctor, John Dickinson, arrived, malaria had already started to take its toll. In addition, dysentery was rife, and the food stores were sadly depleted because of the many local inhabitants taken in at the station after their release from slave traders. It seemed to have escaped the attention of the mission that only by complete, regular dosage of quinine could the hazards of the fever be reduced, although there would still be some degree of suffering. Whatever can be said about the failure of the first UMCA Mission, it should be remembered that it was the fever that drove these men from the Shire highlands.

Malaria and food shortage drove them to Chibisa, which was a fatal blunder. There on the river they were even worse off than formerly. The Bishop died of cerebral malaria, and when the new Bishop eventually arrived to replace him, he decided that the area was far too unsafe, and withdrew the mission altogether. In the meantime, after leaving the missionaries at Magomero, Livingstone went to have another look at Lake Nyasa, trying to discover whether the Rovuma flowed out of it. After spending about 8 weeks, wandering around without any results, he had to go back to the *Lady Nyassa*, his wife, who had come out to join him, Dr James Stewart of the Free Kirk of Scotland, and Bishop MacKenzie's sister, who were on the *Heity Ellen*, which arrived early in 1862. On his way

down he heard of the death of the Bishop, and had to break this sad news to his sister.

The *Lady Nyassa* was launched on 23 June 1862 and taken up the Zambesi to Chibisa, where it had to be dismantled to be carried beyond the Falls and from there it would be assembled once more. All this took a long time. Meanwhile Mary Livingstone died of cerebral malaria and Livingstone was shattered by her loss. But no matter how great his suffering, he would not let himself be deterred. He had a mission to carry out and had to go ahead with it. He explored the Rovuma again as to its navigability (a further example of his obsessional personality) and had to admit that it was impossible to navigate.

Kirk was upset by this insistence in spite of advice from all sides, and began to wonder if Livingstone were out of his mind. Livingstone was most disappointed, for after 5 years on the Zambesi, his dreams of introducing legitimate trade and civilisation to the interior seemed more remote. Yet he was quick to recover his spirits, still hoping that once he had his boat on the lake, he might find a way out to the sea from there. At least, he felt, it would stimulate legitimate trade around the lake and its environs, and thus strike at the slave trade. So he went back, but was unable to go up the Shire because the river was too low. Later, in January 1863, it was high enough for him to travel and he set off.

Unfortunately he was stuck in the Elephant Marshes for three months and there fever played havoc with his crew and destroyed their morale. Thornton and Rowley died of fever. By this time more deaths had occurred on the UMCA Mission. Dr Dickinson, Bishop MacKenzie, Burrup and Scudamore had all died. At last Livingstone was able to leave the Elephant Marshes and reached the cataracts. He could not take his boat across them yet, since his road was not completed.

By this time the British Government was worried by the number of deaths on the Zambesi and felt the expedition was not warranted, so when Bishop Tozer arrived to take over the mission, he brought with him an official letter recalling it. This was a great blow to Livingstone, who had not yet found an independent route into the interior.

What was he to do now? Should he retire in Britain? He quickly made up his mind that whatever happened, he would return to Africa on his own. He realised by this time that he was a lone worker and would be happier without the responsibility of others or having to depend on a sponsor. All his capital had been sunk into the *Lady Nyassa*. In order to free it to finance his travels, he would need to sell the boat. So he sailed it from Quelimane in February 1864 via Mozambique and Zanzibar, across the Atlantic to Bombay, to dispose of it.

This was the most dangerous of all his journeys. It took an amazing amount of courage, especially with his little experience of sailing, to take that small steamboat across the hundreds of miles of rough ocean. He certainly lacked neither determination nor courage. He taught his African crew to steer by the compass. It was such a task that even he felt he might die on this voyage. He reached Bombay safely, but once there, decided not to sell the boat, but to take it back to the lake later when he had found a passage from the lake to the coast.

In spite of its recall, the Zambesi Expedition had been a success in many ways. It proved that the fever could be held in check if properly controlled. Livingstone's men were exposed to it in its worst form in the marshlands of the low-lying Zambesi. He and his party had lived in these dreadful parts for five years plying up and down the rivers, yet, because of his strict regimen for the management of the fever, the expedition survived instead of undergoing a similar fate to that of the Great Niger Expedition. The number of deaths was small in comparison with those of the UMCA Mission that settled first at Magomero in the Shire highlands, and later on the shore of the Shire river itself. Another earlier, much smaller expedition, had ascended the lower Zambesi in a canoe in 1821. All three naval personnel on this expedition were carried off by fever in a matter of weeks. No mention was made of quinine.

Comparing Livingstone's expedition with that of Tuckey up the Congo in 1816, and the later ascent of the Niger (1841 - 1842), we realise what a tremendous difference the Livingstone regimen made in the control and management of the fever. Only 4 Whites died from May 1858 to 30 June 1863, during a period of 5 years' continuous exposure to a most severe form of malaria. Had it not been for David Livingstone's training as a medical man and his malaria regimen, he could not have survived the crossing of Africa. Even if a miracle had happened, and he had lived through this ordeal to lead his expedition up the Zambesi to discover Nyasaland, this would have ended in disaster. Most interesting were his allusions to malaria and mosquitoes on this expedition. He was probably one of the first to notice this, even though he had no idea as to how the relationship occurred. He wrote: 'myriads of mosquitoes showed, as they probably always do, the presence of malaria.'

When Livingstone arrived in England after the Zambesi Expedition, he did not receive as cool a reception as he had expected. The Foreign Office was still interested in his ideas of expansion in Africa. Other countries were interested, so why should Britain not be interested, and what better excuse was there than that of ridding the country of the slave trade? Livingstone was therefore able to arrange with Sir Roderick Murchison to return to Africa under the auspices of the Royal Geographical Society, to explore the watershed of Central Africa and the inner lakes. At the same time he was to preach the gospel and open the country to missionary enterprise and commerce. The Government and the Royal Geographical Society each gave £500 towards this project.

Livingstone left England in August 1865, stopping in India, where he bought buffalo and camels, and engaged men to look after them, hoping they would stand up to sleeping sickness. With his usual obstinacy, he would accept no advice, and when they started dying as they sailed up the Zambesi, although it was obvious to everyone else that they had been bitten by tsetse fly, he insisted at first that they must have been ill-treated by the men in charge of them. In March 1866 he sailed up the Rovuma again, this time to avoid the Portuguese.

From this time onwards he seemed to be wandering around as though he were lost, hunting for the source of

the Nile — not only physically, but perhaps also in his own mind. He made his way to Lake Tanganyika, reaching it in April 1867, and in September he linked up with an Arab party. He wandered round Central Africa with various Arab parties, discovering Lake Mweru in November 1867, and Lake Bangweulu in July 1868. Still with Arabs, he explored the country around the Lualaba River in July 1869. He has been criticised for travelling with Arab slavers when he was so against the slave trade.

He was not as much opposed to the Arabs individually as to the system; he believed the only way to rid the country of this nefarious trade was for it to be occupied by a decent government which would soon dispose of the traders. At this stage in his travels he was more concerned with avoiding the Portuguese, whom he had thoroughly upset.

His health was bad, too, and physically he was but a shadow of his former self. He had broken down with a tropical ulcer and his haemorrhoids frequently bled. Only his indomitable will remained unshaken. At all costs he felt he should explore the Central African watershed, but he seemed to be wandering around rather aimlessly, often lost.

In July 1871 he returned to Ujiji on Lake Tanganyika, where Stanley met him. He was quite oblivious of the search that had been going on for him and of the rumours that he had perished. Stanley must have been very concerned about his health, since he tried very hard to persuade him to return to England with him. This was fruitless. Livingstone was determined to find the source of the Nile even if he died in the attempt. Finally Stanley left him in March 1872 and went on to Zanzibar.

Livingstone continued his journeys, arriving back at Chitambo's village near Lake Bengweulo, where he died in May 1873 — probably from anaemia, due to gradual exsanguination from bleeding haemorrhoids of such long duration. His dogged perseverance in the face of ill-health, and his almost superhuman courage in proceeding almost single-handed across Africa, almost amounted to an obsession.

Most extraordinary was the way in which his followers took his body across Africa to the coast and found a destroyer to take them back to Britain with it. Chuma, a half-caste, who had worked in a mortuary in Zanzibar, organised the removal of the organs and parcelled up the body for the journey. His heart was not specially buried, as such, as romance would have us believe, but with the rest of the internal organs.

When these people reached England, Sir William Fergusson carried out an autopsy and found the shortened arm that confirmed that it was indeed David Livingstone, and he was buried in Westminster Abbey with national honours on 18 April 1874.

What puzzles us most about this episode is why his followers took his body so many hundreds of miles to the coast. As far as we know from his journals, Livingstone did not make such a request. Did Stanley ask them to do so when he met them at Ujiji? How did they know that his body was of such importance?

Not long after his death, some of the objects for which he strove came into being. The Inyati Mission in Southern Rhodesia was founded and the Scottish Missions started around Lake Nyasa. The UMCA Mission returned to Nyasaland and legitimate commerce was begun by the African Lakes Co. in 1878. In 1891, the Protectorate of British Central Africa was declared over that territory, and in 1895, the Arab slavers were finally defeated. Northern Rhodesia, too, became a British Protectorate and thus the aims of David Livingstone were realised.

In 1957 I wrote: 'It was he (Livingstone) who, by his discoveries and revelations, was responsible for the opening and settlement of South Central Africa. It was he who

was directly responsible for the first mission parties which entered what is to-day Rhodesia and Nyasaland and which were followed later by the colonists. Livingstone was, in truth, the founder of the Federation of Rhodesia and Nyasaland, and Rhodes the one who brought it into reality with an established Government. He was like Rhodes in some ways — an Imperialist.' I have no reason to change my views.

#### REFERENCES

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