"The White Man's Grave:" Image and Reality, 1780 - 1850

There is a "black legend" about the climate of tropical countries, that lives on in spite of the knowledge geographers, meteorologists, and specialists in tropical medicine have gained over the past half century. With all the recent publicity given to West Africa, most people in the Western world carry a half-conscious image of "The White Man's Grave". It is usually elaborated with such elements as "primitive tribes", burning heat, fever-laden swamps, swarming insects, and miles of trackless jungle. Above all, West Africa is thought of as a place where white men cannot work. Only Africans can work there, and Europeans "go out" for brief periods at a considerable risk to their lives. Most of this image is, of course, quite false. Maximum temperatures on the West African coast would be moderate summer heat in the American mid-West. Insects are generally less annoying than they are in the United States. The forest is by no means trackless, but the home of sedentary agricultural people who have for centuries periodically cut it down to burn a place for their farms. Neither physical capacity for work nor immunity to disease is significantly different between Europeans and Africans on racial grounds.[1]

Still, the image was not made up from imagination alone. In its British version, it was based on facts — facts misunderstood in Africa, reported "at home", and repeated over several generations. Both the facts and the image have a part in shaping West African relations with Great Britain, and both the facts and the image have

1. The possibility of some degree of racial immunity is not yet completely out of the question, but recent investigations make it appear to be unlikely or insignificant. Recent studies show that certain haemoglobin characteristics in human blood improve the individual's chance of successfully resisting certain diseases. This appears to be the case especially with the sickle-cell trait, which seems to improve childhood resistence to *Plasmodium falciparum* and is common among African negroes. [A.B. Raper, "Malaria and the Sickling Trait", *British Medical Journal,* II (1955), pp. 1186-1189 (24 May 1955)]. This trait, however, is not strictly parallel to racial type. Some West African peoples have a very large incidence of it, while others have a relatively low one. The ultimate answer must wait for further studies, not only of sickle-cell trait but of other blood characteristics as well. For the time being the answer seems to be sufficiently clear for historical purposes: the really striking immunities of Africans in the eighteenth and nineteenth centuries were overwealmingly acquired in childhood and not inherited.

changed through time in significant ways. The early nineteenth century represents a crucial phase in these changes. British traders had been on the Guinea coast for two centuries before 1783, but the loss of the American War and the thirteen colonies brought a new phase in Anglo-African relations. The old economic contact through the slave trade was under increasing fire in Parliament, and demands for reform implied demands for new forms of overseas enterprise. Any thought of West Africa, however, had to begin with the facts of European mortality on "the Coast".

In rough quantitative terms, any group of European newcomers to the African coast in the later eighteenth century died at a very high rate indeed during their first year on the coast, usually somewhere between 300 and 700 per thousand per annum. After the first shock, the mortality of the survivors was less severe, perhaps 80 to 120 per thousand, but still high enough to cause concern, and several times higher than the death rates in tropical America or Asia. These figures can be explained easily enough in the light of modern medical knowledge. The West African coast is equipped with a full range of unpleasant diseases, from sleeping sickness through Guinea worm, bilharzia, yaws and dysentery, but the principal killers were two, malaria and yellow fever.

Of these two the more serious was probably malaria, and here West Africa was different from other parts of the tropical world where the British had a commercial or political interest. Virtually the whole of West Africa provides an extremely favourable environment for *Anopheles gambiae* and *Anopheles funestus.* Both are among the most efficient vectors for carrying plasmodial parasites from one individual to another. The prevalent form of malaria is *Plasmodium falciparum,* one of the most dangerous of all malarial infections – much more likely to cause death than the *Plasmodium vivax* of the West Indies, which is debilitating but seldom fatal. Furthermore, the relatively dense population of the African coast provides a human reservoir for the disease.

There is no reason to believe that conditions in the later eighteenth century were very different from those of recent years, when virtually the whole of West Africa is classified as an area of hyperendemic malaria. This means, among other things, that the chance of an individual's living as long as a year in West Africa without receiving infective mosquito bite is extremely slim. In some areas the average number of infective bites per person per year may range up to a hundred or more. There is no escape from the infection, but its consequences may vary considerably.

Among the local population, a child is normally infected shortly after birth. During the first years, he fights a life and death struggle with the parasites, and West African children under five years of age show a rate of infestation sometimes approaching 100 per cent. Infant mortality was and is extremely high. Those who survive childhood, however, acquire an apparent immunity from further attacks. This immunity, however, is completely effective only against the same strain of *P. Falciparum* they have known in childhood. Nor is it a true, permanent immunity of the kind that is acquired from an attack of smallpox. It can weaken and even disappear unless an individual is constantly re-infected; but if he is re-infected often enough he will rarely show any clinical symptoms of malaria. Even if re-infected only occasionally, the symptoms will be very mild – nothing more than chills and a slight fever.[2] In a certain sense, then, the African population pays a price in infant mortality for its later protection. European visitors in the past paid this same price in high mortality – but they paid it as adults and not as infants.

Yellow fever was also present, and its behavior is slightly different. For one thing, its vector is another mosquito, *Aedes aegypti,* and one that ultimately turned out to be easy to control. The parasite also behaves differently. Instead of giving an apparent immunity, or a prolongued chronic infestation, it kills the victim within five to seven days – or else allows a complete and rapid recovery and life-long immunity to further attack. This immunity, furthermore, prevents the ex-victim from again serving as host. Since yellow fever is also much less serious for children than for adults, an entire tropical population may have the disease in childhood and develop a really effective immunity.

In some yellow fever areas, where the population is relatively stable and non-immune adult victims are rare, the parasite itself has been known to die out for lack of sufficient human hosts. The vector may still be present, and after a generation has passed and a new population of non-immune adults has grown up, the disease can be reimported. This appears to be the explanation of the great West Indian yellow fever epidemics, and it accounts for the behavior of yellow fever in West Africa. Yellow fever was endemic in West Africa, but the Europeans living there were only a handful

2. M. J. Colbourne and F. N. Wright, "Malaria in the Gold Coast", *West African Medical Journal,* IV, 3-17, 161-174 (1955), and works there cited. I should also like to express my thanks to Dr. Colbourne for answering many layman's questions about malariology. Any errors that have crept in are, of course, my sole responsibility.

among a population of many immune Africans. From time to time the parasite would appear and move rapidly among the Europeans for a year or so before declining again to wait for a new group of hosts to be brought out from Europe.[3]

The facts about West African health in the late eighteenth century were first, hyperendemic malaria; second, relatively frequent yellow fever epidemics spaced at about five to ten years apart; third, extremely high initial mortality for any intrusive population from the temperate zone, and fourth, a pattern of behavior on the part of both yellow fever and malaria, which made it appear that Africans were immune.

These facts could be interpreted in eighteenth-century Britain at two different levels. At the level of sophisticated medical science, they were a problem of particular importance to military and naval medicine. The need to keep troops alive in the tropics was especially heightened during the eighteenth-century wars with France, and tropical medicine was already an important branch of British medicine. At the same time, the germ theory of disease and the cellular structure of the body were unknown. Medical knowledge was still dominated by the tail end of humoral pathology, re-expressed through the eighteenth-century tendency to build medical systems. The essence of any of these systems was to see all pathological conditions as the result of a single set of causes. The humoral pathology considered all disease as an imbalance or impurity of the bodily fluids. Treatment therefore aimed at readjusting the balance by bleeding, purging, and the like. The Brunonian system, which was also popular, insisted the problem was rather with the balance of "tone" or stimulation in the nervous system. Thus it aimed at stimulating or relaxing tensions as needed, but the treatment was in fact the familiar bleeding and purging, stimulants, tonics, and dietary rules.[4]

With this background, the explanation of European mortality followed naturally. The striking known facts were that Europeans died in great numbers, and the places they died in were climatically different from Britain. Thus it was quite clear, or seemed to be, that the climate either threw the liquid balance out of order, or overstimulated the body, or performed analogous changes according to fancy or system.[5]

3. H. H. Scott, *A History of Tropical Medicine,* 2 vols. (London, 1939), pp. 322-23; P. M. Ashburn, *The Ranks of Death* (New York, 1947), pp. 135-136.

4. R. H. Shryock, "Nineteenth Century Medicine: Scientific Aspects", *Journal of World History,* III, 881-908 (1957); Thomas Trotter, *Medica Nautica,* 3 vols. (London, 1797-1803), I, 334-344.

5. L. Rouppe, *Observations on Diseases Incidental to Seamen* (London, 1772),

With this, and much earlier than the 1780's, climate and disease were inseparably and equivocally linked. A "bad climate" was a climate where mortality rates were high. It was also a climate different from that of England. Therefore people who had never been to West Africa assumed that very high mortality meant very high heat and humidity. The African coast took on the popular reputation of a blazing furnace, and it held this reputation in spite of occasional travellers' reports to the contrary. In point of fact, and speaking merely of human comfort, the choice between the British and the West African climates is so close that only personal preference can swing the decision one way or the other.

When it came to tropical fevers, the medical men of the late eighteenth century recognised a connection between fevers and "marsh miasma", though the precise nature of the connection was a subject of endless debate. The most common belief took marsh poison as the "exciting cause" after the body had been acted on by the "predisposing" causes associated with humoral balance or nervous tension. The fever itself was thought of as a disease, or a group of diseases, rather than a symptom. Thus "fevers" were classified and sub-classified according to the height, duration, and periodicity of the patient's apparent temperature. (The clinical thermometer was not in common use until the 1830's.) There were "remittents", "intermittents", "bilious fevers", and "climatorial fevers"; but there was no standardised terminology, and the distinctions commonly made did not really separate out the diseases now recognised as typhus, typhoid, yellow fever, and several varieties of malaria. The term "yellow fever" already existed, but it was not always applied to the disease now called by that name. Thus Schotte, who wrote one of the first really accurate descriptions of yellow fever, insisted on calling it *Synochus atrabiliosa* and reserving the term "yellow fever" for certain forms of malaria. When the term "malaria" first came into common English usage in the early nineteenth century, it meant the marsh poison that caused the disease – not the disease itself.[6]

In spite of all these confusions, the medical men of the late eighteenth century had accumulated a wide range of tropical experience. They believed, rightly or wrongly, that they knew something about the prevention and cure of tropical diseases. Prevention

p. 382; William Hillary, *Observations on the Changes of the Air and the Concomitant Epidemical Diseases in the Island of Barbados*, 2nd ed. (London, 1766), p. vii; John Huxham, *An Essay on Fevers* (London, 1750), pp. 2-4.

6. J. P. Schotte, *A Treatise on Synochus Atrabiliosa, A Contagious Fever which raged in Senegal in the Year 1778* (London, 1782).

was possible by two general courses of action. One of these was the special study of medical topography. It consisted of detailed empirical examination of a tropical region in order to find the places where disease was least common and where it was most common. With this information Europeans could proceed with the proper siting of their trading posts, barracks, and settlements. Sometimes their information was accurate and useful. They knew they should stay as much as possible aboard ship at some distance from shore. They knew it was more dangerous to go ashore at night than in the daytime. They knew that certain off-shore islands like Gorée or the Banana Islands off Sierra Leone were safer than other places, and they generally knew that it was safer to be high in the mountains than it was to live close to the shore. In other respects, however, their information was not accurate. Often they merely singled out the place in West Africa with the most recent yellow fever. That place was dangerous. Where yellow fever had been absent for a time, the "climate" was much better.[7]

A second method of preventing tropical fevers was to follow special rules of personal conduct. These rules differed from one authority to another, but the general tendency was in line both with the systems of medicine and with the proscriptions of European puritanism. All rapid changes of temperature were to be avoided, and there was a special concern for perspiration. It both cooled the body and affected the liquid balance. Wearing of flannel next to the skin was extremely important. It prevented both chills and comfort. Rain and dew were dangerous, partly because they were cooling, and partly because they were sometimes thought to be contaminated with marsh miasma. The most common rule, however, was moderation in all things pushed to an extreme degree. Physical exercise was out, especially in the heat of the day. Mental exercise was also dangerous, and both joy and sorrow were to be avoided at all costs. All bodily pleasures were to be drastically restricted — wines and spirits, sexual intercourse, and eating meat were all liable to bring on a fever.

These rules were on the whole less useful than the guidance of

7. Philippe Fermin, *Traité des maladies les plus frequent à Surinam* (Maastricht, 1764), pp. 4-5; Charles Bisset, *Medical Essays and Observations* (Newcastle-upon-Tyne, 1766), p. 11; James Lind, *Essay on the Diseases Incidental to Europeans in Hot Climates* (London, 1768), pp. 51-52, 127-28, 159-63, 191-96; Edward Long, *History of Jamaica,* 3 vols. (London, 1774), II, 506. For slightly later, but more detailed works on medical topography see Charles Stormont, *Essai sur la topographie médicale de la côte occidentale d'Afrique* (Paris, 1822) and James Boyle, *A Practical Medico-Historical Account of the Western Coast of Africa* (London, 1831).

medical topography, but their importance was even greater. Europeans who went to West Africa badly needed psychological support. They saw others dying all round. To believe that life and death were a kind of lottery was much less tolerable than to believe the dead has broken one of a numerous and complex set of taboos. Once mortality and conduct were seen to go hand in hand, the individual could feel he kept some control over his destiny.

The treatment of fevers in West Africa rested on a base of pure empiricism combined with incorrect theory. Remedies were used that satisfied the commands of a medical system or that seemed to bring relief, but practitioners seldom understood why they brought relief. Treatment therefore tended to change through time, as systems rose and fell in Europe, or as empirical observations changed overseas. These alterations had important consequences for changing mortality in West Africa, since some forms of treatment were beneficial while others were downright harmful.

The most valuable of all was chinchona bark, (and after the later 1820's its derivitive quinine). "The bark" had been known in Britain since the seventeenth century, but it was especially prone to phases of popularity and unpopularity. The great Sydenham had disapproved of it, but in the later eighteenth century it was again popular, being supported by Fothergill and by James Lind's *Diseases of Hot Climates,* published in 1768. Lind recommended not only treatment with bark but also regular prophylactic doses of bark in wine, at least for those who had already experienced one attack of fever. This was an important discovery, since the regular use of bark, even in small quantities, would have had some effect in making malarial attacks less serious. Other practitioners tended to use other remedies such as bleeding, blisters, purging or hot and cold baths, but the tendency of British practice in the last two decades of the eighteenth century was to lean heavily on bark.

In the 1790's, however, there was a change. It came about because different fevers were not clearly distinguished, and chinchona bark is a specific only for malaria. Dr. Colin Chisholm in Grenada reported very poor results with chinchona bark in treating an epidemic that was clearly yellow fever. The anti-chinchona school gained further converts for similar reasons in the early decades of the nineteenth century. By the 1820's, bark was very little used, and the accepted remedy for tropical fevers was a combination of bleeding and mercury treatment with calomel.[8]

8. Colin Chisholm, *An Essay on Malignant Pestilential Fever,* 2 vols., 2nd ed. (London, 1801), I, 365-68, (first published 1795); Henry Clutterbuck, *An In-*

The decline of chinchona and the rise of these new treatments almost certainly had some effect on European mortality in West Africa, though it is impossible to say in quantitative terms what it may have been. We have numerous partial statistics on European mortality, but too few of them distinguish between the new arrivals on the coast and old residents.[9] Two separate kinds of evidence are, however, available and throw some light on the matter. First, the subjective impression in the press comments, government reports, and travellers' accounts indicates that Sierra Leone's reputation as the White Man's Grave was somewhat stronger in the decade of the 1820's than it was at any other time before or since. Second, modern medical opinion throws some light on the probable consequences of medical treatment at this time. The prophylactic use of chinchona had been given up except in the navy, where it seems to have been used only irregularly. After about 1815, the bark was taken only as a tonic to aid recovery and not in sufficient quantities and at a sufficiently early stage to do as much good as the treatment prescribed by Lind would have done. Thus, the most valuable form of treatment known was out of fashion. Furthermore, the new forms of treatment were positively harmful. General bleeding from a cut vein was increasing, and the quantities of blood taken were heroic. Twenty ounces of blood is the amount normally taken for a blood transfusion today, and the human body is generally accounted as containing about 180 ounces of blood. The normal practice of doctors in West Africa was to take twenty to fifty ounces at the onset of a fever, and more later for a total that could exceed one hundred ounces. Since anaemia is a common condition accompanying malaria, any victim needs all the blood he has.

The effect of mercury treatments must have been similar. Malaria is seriously dehydrating. Calomel is a strong purgative, and would dehydrate even more. But the dosage was not simply that of a purge. The intention was to give mercury to bring about a profuse salavation, it being observed that a patient who salavated following mercury treatments usually lived. In this case, however, the doctors mistook the mark of recovery for the cause of recovery. They tended therefore to load the patient with more and more calomel until he either died or recovered. At times the dosage went

quiry into the Seat and Nature of Fever, 2nd ed. (London, 1825), pp. 404-05; James Johnson, *The Influence of Tropical Climates on European Constitutions,* 2 vols., new ed. (Philadelphia, 1821), I, 53, (first published London, 1813).

9. See R. R. Kuczynski, *Demographic Survey of the British Colonial Empire* (London, 1948), I, 286-300, for some representative estimates.

as high as fifty or sixty grains a day for four or five days, in some instances rising as high as 500 grains within this period.[10] These two treatments in combination, and in their more extreme forms, might well be enough to kill a healthy person. For obvious reasons, we lack modern experimental data on this point, but the consequence for the patient in a critical condition is clear enough. Some, at least, of the high mortality was a direct result of treatment.

A second level of British interpretation of West African health conditions paralleled the development of medical science. As the doctors struggled unsuccessfully with the problems of survival in the tropics, the popular image of Africa as the "White Man's Grave" was borne home to the educated public. The facts were known to some in the 1780's but they were not widely publicised. Over the half century from about 1780 to about 1830, the "deadly climate" of the African coast gradually became more common knowledge. It was still possible for ordinarily well-informed men to plan settlement colonies in West Africa to replace the lost thirteen in America. One scheme picked the Gambia as a convict settlement.[11] Others hit on the Banana Islands, Sierra Leone, Bulama Island, Cape Mesurado where Monrovia now stands, and South West Africa.[12] Three of these projects were actually attempted — two successive settlements at Sierra Leone in 1787 and 1791, and one at Bulama Island in 1792. This last was the only one with a substantial number of European colonists. The original settlers leaving England in April 1792 numbered 269. By November 1793 all but nine had died or deserted, and the project was given up by those who remained.[13] The first settlement at Sierra Leone failed for reasons that were only partly medical, but the second and successful effort experienced an initial mortality of 49 per cent among its European staff. The Sierra Leone Company, however, only lost 17 per cent of its better-cared-for "upper servants", and it still hoped the "climate" would improve once the ground was cleared and cultivated.[14] They were banking

10. E. Doughty, *Observations and Inquiries into the Nature of Yellow Fever* (London, 1816), pp. 11-12; Nodes Dickinson, *Observations on the Inflammatory Endemic . . . Commonly called Yellow Fever* (London, 1819), pp. 121-168; Alexander Bryson, *Report on the Climate and Principal Diseases of the African Station* (London, 1847), pp. 240-247.

11. "Sketch of a Plan for Erecting a Colony in the Territory belonging to the River Gambia in Africa," enclosed in Edward Morse to Lord Sydney, 26 April 1784, C.O. 267/8. (Here and below, C.O. refers to Colonial Office series in the Public Record Office, London.)

12. See C. B. Wadstrom, *An Essay on Colonialization, Particularly Applied to the Western Coast of Africa . . .*, 2 vols. (London, 1794-95).

13. Philip Beaver, *African Memoranda* (London, 1805), is a full account of this effort.

14. Sierra Leone Company, *Account of the Colony of Sierra Leone . . .* (London, 1795), pp. 47-49.

here on North American experience. It was known that fevers were reduced in North America following cultivation, and it was assumed that the same would happen in Sierra Leone. It is, indeed, likely that *Anopheles quadrimaculatus* was reduced by cultivation in America, but *Anopheles gambiae* breeds under quite different conditions. It was clear by the first decade of the nineteenth century that the Sierra Leone "climate" was not going to improve. Any attempt at European settlement was therefore out of the question.

But officials and merchants had been living on the Coast for centuries, and the impact of high mortality had not been enough to discourage activity on this small scale. By the 1820's, however, even this was called into question. There were serious yellow fever epidemics in Freetown in 1823 and 1829. Some English publicists wished to damn the whole Sierra Leone enterprise as the hair-brained adventure of impractical humanitarians, and the mortality seemed to show how impractical it was. In 1826 the Commissioners Wellington and Rowan visited the African coast and presented a most pessimistic report. During the next few years the image of the White Man's Grave came into its own, and the reputation of West Africa touched bottom. Three governors of Sierra Leone died in three successive years between 1826 and 1828. The Gold Coast forts were turned over to a committee of merchants. Finally in 1830, and mainly for medical reasons, the Government announced its decision to evacuate all possible European personnel from Sierra Leone as well, and ultimately to fill all the posts there with men of African descent.[15]

In this same half century between about 1780 and about 1830, the growing image of the White Man's Grave was having important side effects on British thought. Biologists in Europe had been concerned with the classification of fauna in the Linnaean tradition. The system was steeped in the concept of a "Great Chain of Being". It sought to arrange living things in a heirarchy from higher to lower. Questions of race came naturally into the picture. If the species of animals could be classified, why not the varieties of man? It was possible, indeed, that men were not one species but several. By the 1780's discussion already centered on the famous controversy between the monogenists and the polygenists. The first believed that all men descended from Adam and were essentially as God

15. Commissioner's Report, Parliamentary Papers (cited hereafter as P.P.), 1826-27, vii (312); Report of the Select Committee on Sierra Leone and Fernando Po, P.P., 1832, x (661); Sir George Murray, Commons, 15 July 1830, 2 H 25, pp. 402-405.

created them, in his own image. In spite of a lot of subsidiary arguments, their case rested ultimately on the fact that the varieties of men could breed together and produce fertile offspring. Polygenists, on the other hand, argued that each separate race of man was separately created and endowed from the beginning with its special characteristics. They too had their subsidiary arguments, but the core, that even their opponents had to accept, was the apparent "fact" that in respect to disease the different races of men *were* differently endowed. Differences between European and Negro mortality in the West Indies figured heavily in the argument from the mid-eighteenth century onward. As the image of the White Man's Grave was more and more firmly impressed, the strength of the argument grew. By the middle of the nineteenth century, the deadliness of the African climate to white men, while Africans were apparently healthy there, had been enshrined at the very heart of pseudo-scientific racism.[16]

Still another line of thought stemming from the image of the White Man's Grave was directly concerned with the policy Britain should pursue in West Africa after 1830. The decision of that year was not fully implemented. Among other reasons, the British commitment to maintain the anti-slavery blockade was still widely supported, and the cruisers needed the kind of base Sierra Leone supplied. One problem during the 1830's was to lay down some line of further policy. The human and financial cost of maintaining even a few posts for the anti-slavery patrols was immense, and the slave trade was not in fact effectively hindered. Slavers in greater numbers than ever ran the blockade to Cuba and Brazil. Out of a variety of suggestions, the new policy finally adopted by the Melbourne Government was one that required more activity in West Africa rather than less. The plan was drawn from many sources, but its most famous proponent was Thomas Fowell Buxton, in two books, *The African Slave Trade* (1839) and *The Remedy* (1840). The essence of the plan was to stop the slave trade by encouraging Africans to produce tropical staples themselves, rather than selling the labor force to tropical America.

The project took on physical shape, though somewhat modified

16. For representative opinions in this discussion see: Long, *History of Jamaica;* Charles White, *An Account of the Regular Gradations in Man* (London, 1799); John Hunter, "An Inaugural Disputation on the Varieties on Man" in T. Bendyshe, (Ed.), *Anthropological Treatises of Johann Friedrich Blumenbach* (London, 1865), pp. 360-394 (first published 1775); Sir William Lawrence, *Lectures on Physiology, Zoology and the Natural History of Man* (London, 1819); J. C. Prichard, *Researches into the Physical History of Man,* 2 vols. (London, 1826); Robert Knox, *Races of Man: a Fragment* (London, 1850).

form, in the famous Niger expedition of 1841-42.[17] The planners were fully conscious of the medical problem, and they tried very seriously to take it into account. They equipped the ships with elaborate chemical filters. They consulted medical authorities. They planned to steam rapidly past the "miasma" of the Niger delta, and they based their hopes on many reports of a more healthy interior. For a half-century and more medical speculation had associated fevers with marshes, high rainfall, and dense vegetation. The open savanna country of northern Nigeria was to all appearance a reasonably safe place for at least a few Europeans to live, and Buxton himself was convinced that malarial poison would not be found at elevations higher than 400 feet above sea level.[18] The expedition sailed, therefore, in a mood of popular optimism. As it turned out, the medical planners were wrong on all counts. The filtering system did not filter mosquitos. *Anopheles gambiae* is not, in fact, a swamp dweller. Recent medical research indicates that the incidence of infective bites by anopheles mosquitos is, if anything, higher in the West African savanna than it is in the forest.[19] The results of the expedition were completely in line with earlier experience on the coast. Thirty-five per cent of the Europeans who went to Africa on this occasion died there.[20]

The high mortality was the more discouraging in contrast to the optimistic publicity of the planners.[21] The full impact of the news also came just after the Melbourne Government had fallen. The new Peel government was less prone to humanitarian ventures in any case. It seized on the excuse of the death rate and ordered the expedition to evacuate. Thus the image of West Africa as a "White Man's Grave" was more solidly set than ever. The opponents of the anti-slavery squadron rallied. The hope of the West Indian planters revived. They saw the opportunity during the remainder of the 1840's to try some regulated equivalent of the old slave trade. By importing contract workers from Africa, they could perhaps turn the tables on their Cuban and Brazilian competitors. Thus the

17. See the forthcoming work of R. Robinson and J. Gallagher, *Africa and the Victorians*, and C. C. Ifemesia, "British Enterprise on the Niger, 1830-1869" (unpublished Ph.D. thesis, London, 1959) for recent authoritative treatments of the expedition and its aftermath.

18. J. M. MacWilliam, *Medical History of the Expedition to the Niger during the Years 1841-42 . . .* (London, 1843); T. F. Buxton, *The Remedy: Being a Sequel to the African Slave Trade* (London, 1840), p. 67.

19. Colbourne and Wright, "Malaria in the Gold Coast", p. 167.

20. P.P., 1843, xxxi (83), p. 1.

21. An earlier, private expedition by steamer to the Niger in 1832-34 had lost 83 per cent of its European staff without causing notable comment in the British press.

Niger expedition is usually, and in many respects quite rightly, taken to be another major turning point in British African policy — another impetus to withdrawal, like the nadir of 1830.

From another point of view, the Niger expedition marks the beginning of a new phase — and in quite a different way. From the 1780's onward to the early 1840's, the facts of European mortality in West Africa were relatively constant, while the European image of West Africa was gradually coming into line with the facts. After the early 1840's, they had learned their lesson, and the image was set; but the facts themselves began to change. In significant ways, the British were learning to cope with the "climate" even though they knew little more about the nature or causes of malaria and yellow fever.

The improvement was not the invention of any one man, or any single line of effort. It was the result of a continuous and continuously more careful and systematic collection and analysis of empirical data from the African coast. Naval surgeons supplied part of the information. Local doctors writing on topographical medicine supplied some. Government investigators and commissions gathered other parts. By the later 1840's naval regulations had come to incorporate a good deal of practical information about the behavior of mosquitos, even though no one knew it was mosquitos they were in fact describing. The navy, for example, had found out that crews going up rivers in boats or ashore for wood and water were liable to fevers and these trips were restricted as much as possible. It had accurately calculated the incubation period for malaria so that a case of fever could be traced back to the probable source of infection. Enough was known about the behavior of yellow fever epidemics aboard ship to save some lives: with the first suspected yellow fever case, ships on blockade duty were ordered to leave for a cold climate. Enough was known about the range of *Anopheles gambiae* and other African mosquitos to keep ships at anchor at least a mile from shore.[22]

Another line of development was even more important, and it grew out of actual experience on the Coast rather than academic science in England. Heroic blood-letting and heroic doses of calomel remained fixed in British practice into the 1850's and even later. Medical men in the navy in Africa, however, had more occasion to see fever patients year in and year out. Their rebellion began in some cases even before 1830, but the important reforming publication was that of James Boyle, the Colonial Surgeon at Sierra

22. Bryson, *Principal Diseases,* pp. 178, 212-218, 220-228.

Leone, in 1831. He opposed the practice of general bleeding and increased the use of chinchona bark, especially for the control of recurrent attacks. Within a decade the free use of the lancet was uncommon on the Coast, even though the less harmful leeches and local bleeding continued.

This stage of progress was reached at the time of the Niger expedition where patients were spared large-scale bleeding but still treated with calomel to produce salavation. During the 1840's, however, mercury also began to decline. This change went back in part to the work of Dr. William Stevens in the Danish West Indies, but it also found echoes on the West African Coast. Both reforms were taken up by the navy through the efforts of Dr. Alexander Bryson in his official *Report on the Climate and Principal Diseases of the African Station* in 1847. Bryson had both the sense and the humility to realize that there was no direct cure for "fever". It could be partly controlled by quinine. Beyond that all the doctor could or should do was to make the patient as comfortable as possible. (Seamen would still die of fever, but at least they were spared the additional agony of a "night-cap blister" covering the whole of the scalp.)[23]

The third important reform in medical practice during the 1840's was the introduction of regular quinine prophylaxis against malaria. Like the abolition of bleeding and calomel treatments, it began with empirical experimentation on the coast, found its way into the official practice of the navy, and from there was spread widely. It is impossible to say just who invented quinine prophylaxis, since prophylactic chinchona had never died out completely. It held its place in the official Admiralty instructions to naval surgeons, in spite of the general trend against chinchona in the first decades of the century. The printed *Instructions* of 1814 called for dram of Peruvian bark in wine to be given to each man sent ashore on duty in a tropical climate, and the same in the evening when the men returned. These orders were carried without significant change in the later editions of 1825, 1835 and 1844.[24]

Even this much chinchona bark would do some good, though the quantity was too small and it was not taken with enough regularity to give real protection. It was not, in practice, often taken at all. The men disliked the taste and many surgeons followed their

23. Boyle, *Medico-Historical Account,* pp. 84-137; Dr. R. R. Madden, Commissioner's Report, P.P., 1842, xii (551), pp. 424-25; MacWilliam, *Medical History,* 194-98; Bryson, *Principal Diseases,* especially pp. 232 ff.

24. *Instructions for Surgeons of the Royal Navy* (London, 1814).

times in distrusting the drug.[25] Really useful chinchona prophylaxis had to wait for the development of more palatable chinchona derivatives, cheaply produced, and backed by medical authority. The first step was made in 1820, when Pelletier and Caventou isolated two of the basic chinchona alkaloids, one of which was quinine. It began to be produced commercially in Britain in 1827, and by the early 1830's the price was low enough to make general use possible.[26] By this time quinine was gradually coming into popularity on the Coast as a superior substitute for the bark, but the major change came only with the Niger expedition.

The surgeons on the expedition were ordered to give the men the usual bark and wine at their discretion, and they were allowed to substitute quinine and wine if they thought necessary. Some of them followed this advice at least irregularly, and two of them were very favourably impressed with the results. Dr. T. R. H. Thomson continued his experiments after the expedition withdrew from the river. He found the earlier dosage had been too small and too irregular, and that maximum protection could only be had with six to ten grains taken daily. He experimented on himself and had no fever in Africa, even though he was ashore a great deal. When he returned to England, however, he stopped taking quinine and came down with malaria.[27] Thomson was the first to publish his results in a prominent journal, but similar experiences were reported by other naval surgeons. Alexander Bryson studied the accumulated evidence and showed in 1847 that there was a close correlation between the incidence of regular bark or quinine prophylaxis and both mortality and morbidity.[28]

As a result of this work, the navy changed over to quinine as the usual prophylactic and new orders were issued extending its use by shore parties. At the end of 1848 the Director-General of the Medical Department of the Army sent a circular to West African Governors, advising quinine prophylaxis. The knowledge immediately became almost universal among Europeans on the Coast, and it was already spreading even before official notice had appeared. By the early part of 1848 it had become common practice for Europeans on the Gold Coast to keep a bottle of quinine on the

25. A. Bryson, "The Prophylactic Influence of Quinine", *Medical Times and Gazette,* VIII (new series), 6-7 (7 January 1854).

26. P. F. Russell, *Man's Mastery of Malaria* (London, 1955), pp. 105-6.

27. T. R. H. Thomson, "On the Value of Quinine in African Remittent Fever," *The Lancet,* I (1846), pp. 244-45 (28 February 1846).

28. Bryson, *Principal Diseases,* pp. 218-19.

side table, to be taken at the slightest feeling of danger.[29]

But even yet the knowledge was fragile. No one understood what the quinine actually did. Some feared that it might have harmful side effects. The final mark of popular success came only with the *Pleiad* expedition to the Niger in 1854. With medical orders prepared by Bryson himself, and under the command of Dr. Baikie the expedition sailed up the Niger and the Benue further than any Europeans had done before, and Dr. Baikie returned to the coast without a single fatality. Coming as it did after the medical failure in 1841, this set the reputation of quinine in the public mind, both in Britain and on the African coast. Curiously enough, Baikie himself at first played down the role of quinine. He thought his care in selecting the proper season of the year had been more important.[30] The general and overwhelming impression, however, was that quinine prophylaxis had made the Niger usable by Europeans as it had not been in 1841. This was so much the case, indeed, that some authorities used to give Dr. Baikie credit for inventing quinine prophylaxis.

For the future health of Europeans in West Africa, quinine prophylaxis was probably the most important of the medical reforms introduced in the 1840's, but its consequences cannot be separated from the general improvement that came in the late 1840's. The direction and approximate magnitude of this change is clear enough. The best statistics for West African mortality are those for the African squadron of the Royal Navy. Mortality per thousand mean strength dropped from 65 per thousand in the period 1825-45 to 27 per thousand in the period 1858-67, and the sharpest decline centered in the mid-1840's.[31]

Striking as these figures are, they cannot be taken to be absolutely representative of changes on shore, where in any case the death rates would have been much higher. The trend on shore, however, shows a similar timing and magnitude on other evidence. As to timing, officials and other observers in all three of the existing British colonies reported a very marked "improvement of the climate" in the later 1840's and early 1850's — and this in spite of a

29. Fitzpatrick to Grey, 10 March 1850, P.P., 1850, xxxvi [C. 1232], p. 95; "Reminiscences of the Gold Coast", *Colburn's United Service Magazine,* III (1850), 584.

30. A. Bryson, Memorandum for the Chadda Expedition, Nigerian National Archives, Ibadan, Calprof 1/9; Dr. W. B. Baikie, in *Reports of the British Association for the Advancement of Science,* XXVI, 106-7 (1856).

31. The annual average mortality from all causes was still 58 per thousand during the three years 1840-42. By 1846-48 it had already dropped to 27 per thousand. (Bryson, *Principal Diseases,* pp. 177-78; P.P., 1850, xxiv (35), appendix, p. 211; P.P., 1867-68, lxiv (158), p. 7).

yellow fever epidemic in Sierre Leone in 1847.[32] Some suggestion of the probable magnitude of the change between the early and late nineteenth century is found in the two surveys most nearly covering statistically viable groups of Europeans. Between 1819 and 1836 the annual average death rate per thousand mean strength of European troops on the West African coast was 483 for enlisted men, and 209 for officers. Between 1881 and 1897 the annual average death rate for officials was 76 in the Gold Coast and 53 in Lagos.[33] Since there were no further medical reforms between the 1850's and the 1880's comparable to quinine prophylaxis or the abolition of dangerous treatments, it is fair to assume that the medical reforms of the 1840's reduced European mortality on shore by at least half and perhaps more.

A change of this order was certainly not enough to abolish the image of the "White Man's Grave", but it was enough to bring about a new note of optimism in certain missionary and government circles from the late 1840's onwards. It stood behind Earl Grey's efforts to give further reality to the judicial protectorate on the Gold Coast. It encouraged the missionaries to push into Yoruba in greater numbers, and the new spirit of intervention in African affairs was represented on one hand by the treaty policy all along the coast and on another by the capture of Lagos in 1851 and its erection into a new colony in 1861. It encouraged further commercial, missionary, and government efforts to make use of the Niger as a route into the interior. While the medical reforms were not a direct cause of the later scramble for Africa, they were clearly a technological leap forward. As such, they were necessarily an important permissive factor. Whatever other influences were at play in the second half of the nineteenth century, the history of tropical Africa would certainly have been very different if European mortality had continued at the old rate.

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32. [Elizabeth Melville], *A Residence in Sierra Leone* (London, 1849), p. 77; Benjamin Pine, Annual Report for Sierra Leone, 1847, P.P., 1847-48, xlvi [C. 1005], p. 196; N. W. Macdonald, Evidence to Lords' Slave Trade Committee, 14 May 1849, P.P., 1849, (Lords) xxxviii (32), p. 123; Bannerman to Grey, 7 April 1851, P.P., 1851, xxxiv [C. 1421], p. 198; Stephen J. Hill, Annual Report for the Gold Coast, 1851, P.P., 1852, xxxi [C. 1539], p. 186; and three opinions from the Gambia, quoted in Kuczynski, *Demographic Survey,* I, 386.

33. P.P., 1840, xxx [C. 228], pp. 7, 24; Kuczynski, *Demographic Survey,* I, 535-536.