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Some Considerations of the Effects of Certain African Diseases on the Health of the Population *

BY

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Although for long now we have been acquainted with the many diseases occurring in Africa, yet, as our experience grows, we find the subject by no means easy. For instance, one might think that by now we should know all about the clinical effects of malaria on this continent, yet, when the experiences of the different workers in tropical Africa are pooled, one finds so many conflicting opinions that one begins to wonder if our knowledge is really much further advanced than it was some 70 years ago, when we first began to study the disease microscopically. But in spite of this we have advanced considerably.

The mistake made in the past, and still being made in some quarters to-day, when assessing the effects of the diseases, was to look upon them as separate entities instead of viewing the picture as a whole, since the majority of African subjects suffer from more than one ailment at a time. The picture of disease in the African is a complex one. With the European the problem of tropical disease is much more simple. We can assess in him the effects of malaria, bilharziasis, hookworm disease and amoebiasis more accurately, because he seldom suffers from two or more diseases. In the past, knowing the effects of the various diseases on the European, we simply applied our conclusions to the African, forgetting that the vast majority of Africans have built up an immunity to malaria from infancy and probably to bilharziasis and hookworm disease from later childhood and, in addition, suffer from chronic malnutrition. The clinical picture, therefore, is probably very different to that seen in the European. Let me give you a simple example. A Native is found to be anaemic. In former days, if hookworm ova were found in his stools, there was a risk that he would be regarded as suffering from hookworm anaemia. Little consideration might

have been given to the possibility that he might have malaria in his system and very possibly bilharziasis as well, another anaemia-producing disease, and that he was almost certainly living on a diet lacking in the essentials for the formation of blood. In other words, the problem is not a simple one and rarely can the effects of disease be attributed to a single factor. In the African the underlying principle is the existence of a multiplicity of causes. It is thus dangerous to attempt to deal with disease in these people from a single angle, and jump at hasty conclusions. The problem must be tackled as a whole. But as I hope to show later, it is not merely a pathological problem—that is, a problem of disease. It is a problem which involves the appreciation of his outlook and his attitude to disease. One must know not only the diseases of Africa, but also the people with whom we are dealing.

MALARIA

People mostly understand malaria often to be fatal, producing a high sickness rate, anaemia and abortions. This is true in the European, but there is a school of thought which doubts it in the African. There are many allegations in the medical literature that malaria in a hyper-endemic area is an important cause of death in the infant and accounts for many abortions and stillbirths amongst the indigenous population. Other workers disagree. An interesting publication is that by Professor Garnham (1947), who studied the effects of malaria on infants and children amongst the Luo tribe of Kavirondo, Kenya. He found that malaria was the causal factor in only a small percentage of the abortions—slightly over 10 per cent. It seldom caused stillbirths—under 2 per cent. A characteristic feature of malaria in the children was its mildness. In only 10 per cent. of the total number of children studied could the illness be classified as severe. He examined 75 children periodically for two years to study the effects of the disease, and noticed that there was little deterioration in their general physique. The fever was mostly slight and uncommonly above 100° F. During their first attack of fever the normal increase of weight was uninterrupted in a third of the children, and in the remaining two-thirds it remained stationary or showed only a slight loss. The blood count was lowered in 13 per cent. of the children during the first attack, but after five months of continual malarial infection it had returned to normal. By the age of six months, Garnham found that half the children showed malarial parasites in

* An address delivered to the Regional Conference of the Associated Countrywomen of the World in Salisbury on 27th September, 1955, and published with the permission of the Secretary for Health.

their blood, and by the time they were a year old all of them had the infection.

This brings one to an important point, namely, that many children harbour the parasite in their blood at any time, and should they die of tuberculosis, pneumonia or some other disease, the death may be attributed to malaria, if only the blood is examined. Garnham studied 52 autopsies on children whose blood showed malarial parasites, and in only 17 of these (a third) could he attribute death to malaria.

He concludes that whilst malaria may occasionally be fatal in hyperendemic or endemic areas of Africa, it is much less than is commonly supposed.

Somewhat similar findings were reported by Colbourne (1954) from Accra, which is in a hyperendemic malaria district in the Gold Coast. In Accra it had been estimated that 500 deaths each year occur from malaria in children under five. This impression was gained because about two months after a heavy rainy season there was a rise in deaths, whilst in a dry year fewer deaths were recorded. However, when anti-malarial schemes were introduced in 1943, 1944 and 1945 the death rate in the children remained almost the same in a high rainy season, and was in fact higher than in the dry season before anti-malarial measures were undertaken. Therefore there must be some other connection between high rainfall and the death rates. Schwetz, working in the Lango district in Uganda, found that *P. falciparum* infection was present in 85 per cent. of children four to six months old, and in 83 per cent. of those seven to twelve months of age. He noticed that a large number of parasites were found in the blood of the infants, but none had fever and they all seemed in good health.

The picture presented by malaria in an area depends on the altitude and rainfall. As the altitude increases, the transmission period becomes shorter. For instance, in the lower altitudes along the African coast and for some distance inland, in an altitude under 1,400 metres, the transmission of the disease takes place almost throughout the year. But above this altitude the transmission period becomes shorter. Now in hyperendemic areas, which are those in which the period of transmission is long, a high tolerance to the disease results. In infants under a year a certain proportion suffer from the disease and may die in the absence of treatment, but the survivors are out of danger in the second year. Opinion remains uncertain as to what extent the individual is physically handi-

capped by it, but it is probably only slight and, as already mentioned, the infant morbidity may be due to other factors besides malaria. Epidemic malaria is not the rule in places where the transmission period is long, but in regions above 1,800 metres, where it is shorter, epidemics may occur. This is probably because the people are not subject to the constant re-infection that takes place at a lower altitude.

BILHARZIASIS AND HOOKWORM DISEASE

It is generally agreed that in the European, bilharziasis is a debilitating and often serious disease. In the African most agree that it has serious effects on the health of the individual. But there is a smaller school of thought which believes that as the African is constantly re-infected from childhood onwards by repeated exposure to the disease, he builds up an immunity or resistance to it, resulting in a *status quo* between the host and parasite. I personally do not believe this and consider that anaemia, chronic ill-health, abdominal pains, uraemia and death are not uncommon. There is much argument as to whether or not cirrhosis of the liver, a frequent and serious malady in the African, is due to bilharziasis. This view is supported, particularly in Egypt, but because cirrhosis of the liver is found in territories such as Uganda, where in certain areas there is no or little bilharziasis, other workers do not accept this theory.

Hookworm disease like bilharziasis is common, although not to the same extent. The parasite may infect a high percentage of the population in an endemic area, which is usually in the low-lying and moister parts of the continent. The disease causes abdominal pains and anaemia, depending upon the degree of infestation, and is, I think, a cause of chronic ill-health. Hookworm disease is rarely seen in infants, but its incidence increases from early childhood, when the child is allowed to wander around.

An interesting study was made in Northern Rhodesia by Beet (1949) on the effects of malaria, hookworm disease and bilharziasis on the haemoglobin levels in African children. He investigated 630 rural Lala children and found the blood levels under 12.3 gm. per cent. in 48 per cent. of the children. As his control he estimated the blood level in European school children in the Broken Hill area and found it to be 13 gm. per cent. He found that the Lala children with hookworm disease (47 per cent. in his series) had similar haemoglobin levels to those without the disease. He then compared the haemoglobin levels in the children suffering

only from bilharziasis with those with multiple parasitic infections (bilharziasis, malaria and hookworm disease, and again the levels were practically the same.

diseases are often responsible for permanently crippling the health of the individual and even for death.

Haemoglobin Levels in Children With Hookworm and Those Without

Total No. Children.	Haem. Level. Below 12.3. No.	Children With Hookworm.	Haem. Level. 12.36 G%	Children Without Hookworm.	Haem. Level. 12.3 G%
630	301 (48%)	299		331	

Haemoglobin Levels in Children With Schistosomiasis and Those With Multiple Parasitic Infection.

Total No. Children.	Children With Schistosomiasis.	Haem. Level.	Children With Multiple Parasite Infection.	Haem. Level.
630	116	11.6 G%	117	11.7 G%

Beet therefore concluded that hookworm was not an important cause of anaemia. He came to the same conclusion with regard to malaria by comparing the haemoglobin levels of children with the disease, and those without, both during the wet and dry seasons. However, he did not exclude altogether malaria, hookworm disease and bilharziasis as leading to anaemia, and believed that they played some part in affecting the health of the children.

Somewhat similar results were obtained by workers in a West African village on the Gold Coast (Colbourne, Edington and Hughes, 1950). They studied the incidence of parasitic diseases (malaria, bilharziasis, ascariasis and hookworm disease) amongst children with or without signs of malnutrition, choosing two age groups—the young from one to five years and an older one, six to fifteen years.

THE NUTRITIONAL FACTOR

The whole emphasis to-day seems to be placed on the part played by nutrition. Whereas until recently malnutrition was largely ascribed to lack of vitamins, especially those causing pellagra, scurvy and night blindness, the blame now is laid on the lack of proteins. The African's diet is notoriously poor in protein and rich in the cheaper carbohydrates. The authorities claim that kwashiorkor, a most fatal and prevalent form of malnutrition in the African infant, is due to protein lack. The same is said of cirrhosis of the liver, and the latest view is that the common anaemia of Africa results from lack of protein rather than by the parasites of hookworm disease, bilharziasis and malaria (Woodruff, 1955).

Percentage Incidence of Parasitic Infections in Children With and Without Signs of Malnutrition.

Age Group.	Malaria.	Ascariasis.	Hookworm.	Bilharziasis.
1—5 years—				
23 with signs of malnutrition	86.9	85.7	61.9	4.7
27 without	70.4	84.6	34.6	3.8
6—15 years—				
19 with signs of malnutrition	26.3	68.4	57.9	16.6
47 without	44.7	85.1	48.9	12.8

Again they failed to demonstrate any significant difference. Malnutrition did not appear to be much more frequent in those with the diseases, and they conclude that parasitic diseases do not seem to have much effect on the production of malnutrition.

At this point I wish to say that when studied in groups the conclusions tend to show that malaria, bilharziasis and hookworm do not appear to have much serious effect on the individual, yet in my experience these diseases should not in any way be ignored and each individual case should be studied on its own merits, when one finds that these parasitic

Kwashiorkor is an acute and fatal disease frequently seen in tropical Africa, affecting children mainly in the first two years of life. It first appears typically shortly after weaning and is characterised by diarrhoea, swelling of the face and limbs and peeling of the skin. The child becomes very fretful and death often follows. This disease, although first recognised in Kenya in 1926, was more fully described by Cicily Williams, a woman doctor in West Africa. It was originally attributed to a lack of vitamins or too much starch. To-day a deficiency of protein is held to be the cause, and it is true that protein given to these babies cures more than

hitherto, although not all of them. It has been noted that African babies are generally in good health for the first six months of their lives, due largely to the excellent supply of breast milk. But the African mother feeds her baby for about eighteen months, often after she no longer has sufficient milk. The baby fails to gain weight, and when it is weaned, especially if it acquires an attack of enteritis or malaria, the balance is upset and its health breaks down, often with the disease kwashiorkor. Silvera and Jelliffe (1952), working in West Africa, claim that, when studying the livers of stillbirths or infants who had died shortly after birth, they were already damaged. They believe that kwashiorkor actually commences *in utero* and becomes apparent when the child is taken off the breast and put on to a predominantly carbohydrate diet.

It has also been suggested that African children are lighter and smaller than European boys and girls, and this is attributed to their poorer diet. Several surveys have been carried out in different parts of Africa, and they all tend to show the high incidence of nutritional changes in African children. For instance, in a health study of 800 Bantu children, Kark (1944) found a lustreless skin in 61 per cent. and skin changes suggestive of vitamin B rash in 20 per cent.

Jelliffe (1952) has shown that mother's milk is adequate in protein but not sufficient in quantity after the first year, and therefore the real breakdown occurs when the child is weaned and taken off its protein. The outlook with regard to breast feeding in the African is not a happy one, as the more educated the woman becomes, the less she tends to breast feed her child, and unless she can replace her milk with more protein, malnutrition is likely to become accentuated.

EFFECT ON WORK AND THE IMPORTANCE OF KNOWING THE AFRICAN

It is frequently stated that if one treats malaria, bilharziasis, ancylostomiasis, venereal disease, amoebiasis, malnutrition and other chronic disorders with which the African is likely to be affected, he can be expected to do a better day's work. This is not necessarily correct. Several surveys in Africa have shown that there are other factors necessary to obtain good work out of a man. Let me quote briefly a survey made by Dr. Cowan Young (1955) on a tobacco farm in Southern Rhodesia. The farmer gave his employees a good diet, including fresh milk and vegetables, and Dr. Young found little malnutrition amongst them. On the other hand, a high number of the labourers were in-

festes with bilharziasis, amoebiasis and hook-worm disease. Those infested were given the recognised treatments, and when re-examined six months later, 74 per cent. (69) were found to be free of these diseases in contrast to the previous examination, when only 14 per cent. were fit. The farmer was most disappointed to find no obvious improvement in the quality of their work. In other words, poor work is not only a matter of disease. This brings me to the point I wish to stress to-day. The great difficulty with which doctors are concerned is the outlook of the African. To the vast majority the causation of disease is bound up with their religion, and therefore they still resort to their primitive methods of treatment, in spite of the good facilities available to a great number of them. Their religious beliefs intrude into their methods of agriculture and diet and therefore it is not simply a matter of our deciding to make changes.

An interesting study of this subject in the urban areas of Johannesburg was made by Laura Longmore (1954), of the Witwatersrand University, a non-medical person. She found a great clash in the African between the Western and African cultures. They had assimilated much of the European culture, not necessarily the best, and retained a good deal of their own—often the worst. She found that they distrusted many of the hospitals and clinics and that two-thirds of their sick children were not taken to the clinics.

THE HIGH INFANT MORTALITY RATE AMONGST AFRICANS

When the various figures of the infant mortality rates in Africa are studied, it is evident that the mortality rate in African infants is enormous and at least six to ten times that of the European one. Even admitting that there are probably errors in the determination of these figures, they are still extremely high. For instance, a sample survey taken in Southern Rhodesia (Demographic Survey of Southern Rhodesia) by Shaul (1955) shows the infant mortality to be 120 per 1,000, whereas the European one is about 30. In the Union of South Africa the figures differ in various centres. In Pretoria in 1949-50 the European infantile mortality rate was 32.34, and that of the African 181.97. In Durban it was 369, in Port Elizabeth 313 and in Vereeniging 176 (Sacks, 1953). In 1947 Dr. Nelson, the medical officer of health, Pretoria, said "the rate was appallingly high."

I believe that a great advance in the health of these people can be made by reducing the high infant mortality rate. This can be achieved

by improving their environment—better housing and feeding—and better education. Speaking for myself, I would say that the greatest handicap to positive health in the African is his backwardness in education and religion.

Health measures in themselves are not sufficient and are unlikely to be successful without education and religious guidance. This is the aim of the Pholela Health Centre near Durban, established by the South African Government. Here a group of people live in a defined area in which the care of the sick and prevention of disease are undertaken, as well as a programme of health education by trained health assistants. At the same time nutrition is watched, cooking demonstrations held, periodic garden competitions arranged and vegetable gardens maintained around the health centre. In 1942 the infant mortality rate was 275 per 1,000, in 1948 it was 138, and in 1951 it was 100. The crude mortality rates (that is, for all ages) were 38.3 per 1,000 in 1942 and 13.63 in 1950. Thus much can be done for the African by establishing these family services in which the education and health side are both stressed. I realise that this can only be achieved on a small scale, and to attempt it for the whole of Africa would be impossible.

CONCLUSION

To sum up, I have tried to show the difficulty in assessing the effects of disease on the African population on account of the multiplicity of disorders from which they suffer. In the European the picture is more clear cut and the effects better known.

Although all agree that malaria, bilharziasis and hookworm and other tropical diseases contribute towards ill-health in the African, opinion appears to consider these as subsidiary and to favour malnutrition, particularly the lack of protein, as the major factor. But given a good diet, and whenever possible freedom from infection, there is still no assurance that the African will give of his best in his work, because he lacks the urge and drive to make a worthwhile and successful effort. His greatest handicap is

his lack of appreciation of the value of health measures, due to his low educational standard and to his religious beliefs. Improvement can only follow with education and a belief in modern health methods, as well as with a *co-ordinated* drive to eradicate the diseases as a whole.

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