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East Africa High Commission:
(3) East African Medical Survey

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Dear Mr. Rogers:

Citing the high disease rates of natives as a great barrier to progress in East Africa, the several annual reports of the East African Medical Survey plead that a switch to preventive, as against curative, measures will be necessary to reduce serious effects of disease upon the economy of the area. The successful initiation of large scale preventive measures, the reports continue, cannot be undertaken without improved knowledge of such things as vital statistics and of the relative economic importance of various diseases. To gain this knowledge and subsequently to test and prove preventive methods together constitute the mission of the Survey.

The East African Medical Survey was established following Professor McSwiney's Report on his visit to East Africa in 1946. As early as 1947 survey work at Malya was being carried out by two junior medical officers, but troubles with housing, recruitment, resignation of staff in 1949, and selection of a headquarters site slowed growth. A director was not appointed until January 1949, and the experimental survey which he carried out that year was partially invalidated due to the lack of laboratory staff which could not be recruited because of the lack of housing. Following "difficulties" the director and one medical officer resigned in October 1949.

During the visit of Professor MacDonald of the London School of Tropical Medicine and Hygiene and the Director of the Bureau of Research in Medicine and Hygiene plans for enlargement and rehabilitation of the Survey were discussed. Proposals subsequently were presented in a memorandum to the Colonial Medical Research Committee. Meanwhile, in October of 1949, the residue of the unit shifted headquarters to Mwanza, came under the acting directorship of Lt. Col. W. Laurie, Director of the Filariasis Research Unit, and shared temporary accommodations with the F.R.U. It was decided to integrate the physical plant of the two units, and combined plans for housing and laboratory accommodation were drawn up. In certain administrative and technical aspects, the two units could be regarded as a joint undertaking.

Under the clause regarding "further Research Services" of the Order in Council establishing the East Africa High Commission in 1948, the administration of the Survey was assumed by that body at the beginning of 1950.

The Director of the Survey is administratively answerable through the Administrator, in the latter's capacity as a Principal Executive Officer of the High Commission, to the High Commission. The Bureau of Research, however, serves to advise and coordinate the Survey's research programme with others in East Africa, and to stimulate useful communication with other research bodies within and outside the area. The laboratory staff at Mwanza and outlying field teams comprise the sub-groups of the Survey.

Recruitment of staff has been a major difficulty. In 1948 only two junior medical officers were recruited for field work. In 1949 an administrative officer was obtained and a director was appointed who resigned late in the year along with one of the junior medical officers, leaving one medical and one administrative officer. Assignments of a Senior Medical Officer, a statistician and four technicians were not arranged because no housing was available. The result was a lack of laboratory support for the field work during 1949. In 1950 only one quarter of authorized staff had been recruited, all locally, and it was complained that "the situation as regards recruitment is serious."¹ In the second half of 1950 an entomologist and another physician were secured, and by the end of 1951 the European staff had been enlarged to include a laboratory staff consisting of the Director, a pathologist, a statistician and technical personnel numbering three. An additional post of Bio-Chemist was vacant. The field staff had been rounded out to five Medical Officers, with a vacancy existing for a sixth. The office staff consisted of an administrative officer and a Charge-of-Stores, with a third post of secretary vacant. By the end of 1952, however, the laboratory staff was still inadequate.

Careful training of staff in field diagnosis where laboratory verification is impractical was especially arranged for 1949. The Inter-territorial Leprologist agreed to provide instruction regarding the diagnosis of leprosy and two officers at Mulago Hospital would teach the diagnosis of malnutrition. Other subjects were also arranged. The training of laboratory staff was set up with the help of Kenya and Tanganyika officers. Nine Africans were being taught by the Senior Pathologist of Tanganyika and two Europeans were given instruction in entomology at the Research Laboratory at Nairobi.

Plans for combined laboratory and housing for the Survey and F.R.U. at Mwanza were drawn up early in 1950, and the new laboratory was to be completed by March 1953. A temporary laboratory was meanwhile shared with the Filariasis Research Unit. By the end of 1951 European housing was complete. Earlier expedients had included the borrowing of accommodations from the Tanganyika Government at Malya and the accommodation of staff in rented quarters in Mwanza. Some delay was experienced during the selection of sites, and, as commonly experienced in East Africa, the plans of the Survey were very greatly delayed by the need for putting up their own buildings.

Expenditures of the East African Medical Survey in 1949 and 1950 were as follows:

	<u>1949</u>	<u>1950</u>
Recurrent	£5,815	£12,371
Extraordinary	<u>939</u>	<u>2,396</u>
Total		£14,767

All of the extraordinary expenditure in 1950 was apparently for the joint headquarters of the Medical Survey and the Filariasis Research Unit. Revenue was £59 in 1949 and £106 in 1950.

All net expenditures - recurrent and capital - were met entirely through C.D.&W. funds in 1949 and 1950, the East African territories making no financial contributions. Net expenditures on the joint headquarters were met entirely from C.D.&W. funds under C.D.&W. Scheme R. 402. All of the net recurrent and extraordinary expenditures in 1949 (£6,695) were paid by C.D.&W. funds under Scheme R. 173 to 173 E, and all of the net recurrent expenditure in 1950 (£12,265) were paid through C.D.&W. funds under Schemes R. 408 and R. 173 to 173E (£6,019 and £6,246 respectively).

The gathering of technical information and statistics on diseases and the effects of malnutrition is the first overall task of the Survey. This is considered fundamental, because it is intended to supply basic knowledge prerequisite to effective remedial action. As the diseases and other causes of morbidity are statistically investigated and assessed in economic importance, a second responsibility, the development or selection of the most economical and effective means of eradication of the more important diseases, comes into play. The latter would sometimes be transitional, from the initial phase of assessment into a recognized second phase of corrective effort. The work of application of the corrective phase might be handed over to the territorial medical departments, with the Survey continuing its investigative operations, possibly extending into other African areas after the first phase is under way.

In the first phase of its work the Survey must determine what infections are present in the people and also which infections cause morbidity. To achieve these ends, the Survey, in each area surveyed, completes a physical examination and a pathological examination (including investigations of blood, urine and stools) of about 3,000 randomly selected individuals. Skin tests such as the tuberculin test are also given. To obtain information on disease - apart from mere infection - a number of separate measures are employed. At least 2,000 individuals should be examined physically; dispensary work should be controlled to provide a breakdown of the diseases which people wish treated; vital statistics of birth and death registers are searched, along with maternity histories from 1,000 to 2,000 women; and dietary surveys are made to determine possible explanations of malnutrition.

In order to test practically the effects of different diseases, after assessment by the above laboratory and statistical means, the intent is to eradicate one major disease from each area - malaria on Ukara Island, for example, or schistosomiasis in the Kwimba area - and thereby obtain a picture of what happens to a population freed from a particular blight. The tools to effect such eradications are being sought by investigations of causes and of methods of control in the laboratory and hospital at

Mwanza, and during subsequent applications of pilot schemes in the field. The two steps of investigation and application were recognized in the 1951 report of the Survey.

To implement investigations a preliminary programme of planning and reconnaissance was assumed necessary. The determination of suitable areas was to be based upon needs that each area have a fairly concentrated population (preferably 300 or more per square mile) representative of the peoples of East Africa, and sufficiently stationary (not migrant or nomad). The people also should be sufficiently cooperative in answering questions and submitting to examinations. The area should be accessible to all weather communications, yet sufficiently isolated to facilitate eradication measures undertaken in the later phase. Several islands in Lake Victoria seemed propitious, and the headquarters was accordingly set up at Mwanza, a rail terminus, road head and Lake Victoria steamer port. Maps were prepared of some typical and relatively static areas deemed suitable for population studies. Further aspects of the plans included pilot surveys - including sample physical examinations of natives - to ensure suitability of given locales for more intensive surveys.

The actual medical survey was to follow, with emphasis on speed because of the variations in infections due to seasonal climatic alterations. Field teams would carry out the detailed physical examinations with skin tests to obtain figures on leprosy, malnutrition, skin infections, heart diseases, and central nervous system lesions like parkinsonism. Urine specimens and swabs would be checked comprehensively in laboratory. A need was recognized for cooperation of local experts and use of outside resources, should the Survey later assume responsibility for eradication measures. The experimental eradication of malaria in a particular area, for example, would be undertaken in cooperation with the Interterritorial Malariologist.

This more detailed plan of work was not implemented until late 1950. The value of a preliminary survey at Malya in 1949 was reduced by lack of laboratory support, and work during the first half of 1950 was limited to collection of maternity histories. Medical survey work on Ukara Island and laboratory examination of Mwanza hospital patients were begun latterly in 1950. During 1951 investigations proceeded in four areas, of which all except one were selected with a view to phase 2 requirements. At Ukara Island it was intended to attempt eradication of filariasis and later of malaria. At Bukoba the target was venereal disease. In the Kwimba area, Tanganyika, peculiarities of water supply created a suitable ground for investigating methods of controlling schistosomiasis and arrangements were made for work to begin in May, 1952. At Mwanza hospital patients were to be examined with a view to comparing their records with those of a "healthy" population. By the end of 1952 the Survey had completed this one special survey - hospital population in Mwanza - and three full field surveys - in Ukar, Bukoba and Kwimba. In addition a survey was being carried out in the Kisii area, Kenya.

Though lack of living accommodations at Malya precluded the possibility of a laboratory being set up for the investigations, considerable work was done during the preliminary trial survey in 1949. Some 1400 people were examined, histories of some 700 married women were obtained, and registra-

tion of births and deaths was introduced. The validity of the figures was greatly reduced by their basis upon diagnosis by examination without laboratory verification. In diagnosis independent or less needful of check by laboratories valuable data on morbidity were obtained. Malaria, schistosomiasis, and bancroftial filariasis were prevalent. Demographic findings were incomplete and in some cases inaccurate, but they served as indications of trends. Age sex distribution figures for almost 1400 people indicated a "young" type population, with some 45 percent under 15 years of age. High fertility rates, apparently unaffected by polygamy, were obtained from histories of women, and infant and childhood mortality was found to be very high, with more than a fifth dying before being weaned and about one-third dying before puberty, the population nonetheless showing a slight increase. Though incomplete, the preliminary survey at Malya yielded many useful data.

Over 2500 maternity histories obtained in the Sengerema Chiefdom, Tanganyika, by the Survey in 1949 and 1950, together with the histories of over 3400 women examined by the Nzega Clinic, Tanganyika, during 1937-1943, which were placed at the Survey's disposal, were analyzed by the East African Statistical Department. The net reproduction rate was placed between 1.3 and 1.7, giving natural increases of 1 and 2 percent per year respectively.

At Mwanza, where research was held up by laboratory deficiencies including a lack of serological equipment and was not begun until late 1950, the intent was to determine, by laboratory examination of hospital patients and other natives, which parasites caused the severer diseases demanding treatment. By comparing findings in the hospital with findings among non-patients in Ukara it was hoped to appraise the relative seriousness of various parasites in terms of disease, apart from mere infection. After an initial three months at the end of 1950 largely devoted to the standardization of methods of investigation, work during 1951 was limited to examination of some 3,000 hospital patients, who were not a representative section of the community in age and sex distribution, and included examination of stools, urines and blood films for parasites, agglutination reactions to disclose infections, a checking of haemoglobin levels, and sputa for tubercle bacilla. Age, sex, and home districts were recorded. To the examiners' surprise (though probably not to Europeans long in the area who were familiar with local native attitudes towards disease) few distinctions could be drawn between the hospital patients and the "healthy" population, though striking differences were found between the peoples of the two localities. An outstanding contrast, likely due to varying standards of hygiene, was between the light and very heavy infections of roundworms in Mwanza and Ukara areas, Mwanza being the more developed of the two. From the examinations of haemoglobin levels came two significant revelations. It was found that only in cases of very heavy infection was there any relationship between hookworms and the development of anaemia. Haemoglobin levels at Ukara and Mwanza were similar though the examinations of stools and urine showed marked differences. The gist of the second finding, arrived at through examination of newly born infants, frequently with enlarged spleens, was that malarial infections were responsible for much infant mortality and morbidity. The enlarged spleens were associated with a sharp fall in haemoglobin levels. A few "agglutination reaction" tests suggested that further investigations would "show that illnesses at present thought to be uncommon are in fact quite common."²

In Bukoba, a well-watered fertile area with good educational, medical and agricultural facilities, the population problem has seemed to be the

reverse of that of Ukara Island. The numbers of the tribe are decreasing, and widespread venereal disease has been said to be the cause. The initial problem facing the Survey was to verify that the tribal population was in fact declining and to determine if venereal disease were the cause. The method adopted was to attempt eradication or at least control of venereal disease in Bukoba. The relatively well-to-do native treasury of the district would provide housing and pay all costs beyond salaries. The form of treatment recommended by the Chief V.D. Consultant to the Ministry of Health was to be used.

In late 1951, before the arrival of principal equipment, work was limited to case findings. During the first three months 2,000 individuals were examined, with 816 (Khan) tests for syphilis, and 1,000 maternity histories were taken. Interim reports worked out through the East African Statistical Department indicated a steady decrease in population, with net reproduction rate estimated at .75 to .80 and the number of children surviving to puberty probably inadequate to maintain the tribe. The 816 blood tests were more than 23 percent positive for males and 28 percent for females, indicating a high rate of syphilis - though only a little higher than on Ukara Island where the population is growing rapidly. Further inquiries bore out that the numbers of pregnancy were fewer, and abortion and still birth rates were higher for women with laboratory-confirmed syphilis infections, but the differences could not explain the contrast in vital statistics between Bukoba District and Ukara Island, where a population equally diseased was increasing.

Work during 1951 afforded no confirmation that venereal disease was the most important factor in the population decline; and it was suggested by one researcher that the loose attitude of the community towards marriage might be to blame. The Director elaborated this point the following year:

"Partly as a result of the easy money from coffee, drunkenness is rampant and marriage ties are loose: prostitution is common due to the women attempting to escape from their life of semi-slavery: and more and more are the people coming to depend on bought foods."³

It is perhaps significant that the scientists concerned, like other scientists attacking problems in East Africa, tended to reach a social rather than technical diagnosis.

With the help of the District Commissioner the Survey built and maintained a Venereal Disease Clinic - one of the first of its kind in East Africa - where over 2,000 had been treated by the end of 1952.

Ukara, an island of some 30 square miles with a population of some 16,400 Wakara, was the site of another survey, with a medical officer, a nutritionist, an entomologist, and agricultural and veterinary officers cooperating. In the first two months, November and December 1950, four weekly dispensaries were set up, one under rather severe conditions in regard to water supply and housing. These months were largely expended in overcoming native shyness and prejudice, and the number of patients examined was less than desired. Several basic impressions were gained, fairly quickly, however.

In 1951 work on Ukara Island was greatly intensified. Thousands of tests and examinations were carried out and medical histories taken. Maternity histories were recorded and birth and death registration records were initiated. Dietary and veterinary surveys were carried out. Detailed reports on incidence of disease were made. Detailed information on reasons for attendance at dispensaries was also recorded. There was a high incidence of malaria in childhood, syphilis, stool parasites, and mild anaemia. A vitamin C shortage was disclosed with scurvy resulting, and essential additions to the diet suggested by veterinary authorities. Examination of birth and death registers gave evidence, concurring with the appearance of crowding of men and livestock, of increasing population. The findings of the veterinary specialist that some of the surplus men and cattle should be resettled elsewhere reinforces a view very familiar to observers of native peoples dwelling in well watered lands elsewhere in East Africa. On the basis of the statistical material on the incidence of infections, an undernourished and disease ridden population could have been expected, but in fact the many parasites have occasioned little disturbance and the Wakara are a sturdy tribe. "The value of the Ukara survey lies in the finding that contrary to opinions previously held, the people of Ukara are not more unhealthy than natives of the mainland. The biggest problem facing the Wakara is not a medical problem; it is one of increasing overpopulation, for which there can be only one remedy."⁴ Resettlement is essential but this will be difficult because of the strong attachment of the people to their island.

A pilot control trial was initiated on Ukara Island to ascertain effective treatments for filariasis. The opportunity also existed for experiment in treatment of ascariasis. No positive results were obtained as regards treatment of filariasis though it was revealed that the drugs, protostib and hetrazan, could render large numbers of patients non-infective of the mosquito. Responses of the 87 patients who took full treatment for ascariasis with the drug hetrazan indicated that this drug, though expensive, could be used effectively to clear a population of ascariasis without danger of poisoning. A preliminary entomological survey was made in respect of insect vectors, but the Survey did not anticipate being prepared during the next two years to attempt malarial eradication.

The Kwimba area of Tanganyika was surveyed because it is typical of the great tract of the arid steppe country of the Wasukuma and because there was reason to believe that schistosomiasis was threatening to become a serious problem in this type of country. The preliminary results showed that the three great problems were malaria, undernutrition, and the potential threat of schistosomiasis. Little could be done to control malaria except to prevent increased spread by providing additional breeding places in new dams. The immediate measure suggested against malnutrition was to educate people to use goat's milk, eggs and chicken. The danger of schistosomiasis is attached to large-scale methods of improving agriculture by the building of dams. If unsupervised the dams provide a perfect breeding ground for snails and schistosomiasis. Since there is now no economical method of controlling the snails, the only means of preventing schistosomiasis is to prevent the snails becoming infected, i.e. to prevent the infected native from fouling the water supply. This can be done by building thorn fences around the dams and drawing water from them in pipes. The cost

would be high - but small compared to possible later expenditures to control schistosomiasis.

Of lesser importance, but significant in terms of cooperative inter-territorial research, was the collection of snails, an extra duty assigned to all survey teams in the interests of identifying intermediate mollusc hosts of the bilharzias. Collections from 52 separate sites were made and a portion identified during 1951.

Cooperation with territorial authorities was evident in the use of territorial and Makerere College officers in training of personnel (page 2 above). Research findings will be available to territorial authorities. Coordination with F.R.U. is achieved by sharing the same Director and location. (The collection of snail specimens suspected of bilharzia relationships is a joint arrangement.) Arrangements for eradication projects have involved cooperation with the malariologist and with the Colonial Insecticides Research Unit. The analyses of maternity histories obtained by the Survey were done by the East African Statistical Department. Public information on progress made is provided in the annual reports, and a range of contacts with outside scientific agencies can be maintained through relationship with the Bureau of Research in Medicine and Hygiene.

Sincerely,



John B. George

P.S.

Footnotes

1. East Africa High Commission, East Africa Medical Survey Annual Report 1950, p. 39.
2. Ibid., p. 20.
3. East Africa High Commission, Digest of the Annual Reports 1952 of the Medical Research Organisations, p. 7.
4. East Africa High Commission, 1951 Digest of the Activities of the Medical Research Organisations, p. 8.

Sources

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