FACTORS IN THE RECESSION OF YAWS IN CEYLON*

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Several factors working together have brought about the recession of yaws in Ceylon. The writer is in agreement with the views of Dr. L. H. Turner, W.H.O. short-term consultant, expressed in his report "An Inquiry into the Decline of Yaws in Ceylon" (SEA/VDT/4). This paper aims to review some of the main causes of the non-existence of yaws in Ceylon to-day.

I. GOVERNMENT ACTION

Yaws is commonly known in Ceylon as "Parangi". Dr. W. R. Kynsey stated, in his report on "Parangi Disease" (Ceylon Sessional Paper VIII of 1881), that an obstinate chronic endemic disease had been known to exist in Ceylon for centuries. The attention of the Government was drawn to the gravity of the problem in 1866 when the Committee of the Legislative Council on Irrigation Works and Rice Cultivation made the following statement:

"The frequent outbreaks of cholera said to be introduced by Tamil immigrants and the prevalence amongst the people for many years past of a very fatal disease reported to be of a syphilitic character, have committed great ravages. The Agent reports that last year the entire population of a village with the exception of three of the inhabitants, was carried off by cholera. It may be further remarked, in reference to the loathsome disease already alluded to, that in the Vanni no man, woman, or child is believed to be free from it. The Committee are of opinion that a professional enquiry should be instituted into the character and progress of this scourge with a view to its mitigation."

Early action was taken by the Principal Civil Medical Officer, Dr. Charsley, on the instructions of the Government, to commence an inquiry. Dr. James Loos, Colonial Surgeon, was instructed on February 19, 1868, to study and report on the "depopulation of the Vanni or Bintenna districts by the ravages of a disease, of which the precise character has yet to be

ascertained". The Kynsey Report, Appendix A, stated that: "The complete eradication of the disease can only perhaps be hoped for from the advancement in civilization and the adoption of improved habits of life among the people themselves".

The following recommendations were made:

- (1) Improved water supplies, especially the repair of a few of the ancient irrigation "tanks" in the affected districts of Vanni and encouragement of people to settle around them, instead of being left to disperse themselves in small communities.
- (2) Establishment of two hospitals at Vavuniya and Mullaitivu and of more hospitals and dispensaries to render aid to the afflicted people.
- (3) Establishment of a medical school in Colombo for "training an efficient class of medical practitioners, who will scatter themselves over the country and displace the present class of ignorant quacks".

In 1872, Dr. Joshua Danforth was put in charge of Vavuniya Hospital. Six months later he completed his report (Appendix B, Kynsey Report) on "Parangi". The views of five other colonial surgeons (Kynsey Report, Appendices C, D, E, F, and G) were also recorded. The introduction to the Kynsey Report quotes letters from Assistant Government Agents (between 1867-72). Their observations on "Parangi" disease in relation to climate, environment, poverty, dirt, crowded dwellings, and lack of clothing are a tribute to their notable concern in tackling the problem. Their interest and anxiety no doubt helped to stimulate and support the officers of the medical service in coping with the problem.

A systematic investigation of Parangi was arranged by Kynsey in 1879. The proforma and instructions are given in the "Introduction" to the Report (pp. 12 to 15). The following line of treatment was advocated in the hospitals:

- (1) A warm bath on admission, the skin to be well washed with soap.
- (2) A tepid bath daily.

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(3) The ulcers to be dressed with carbolic acid ointment or oil (1 to 20).

(4) The internal use of iodide of potassium with decoction of sarsaparilla, followed by a course of cod-liver oil and iodide of iron.

(5) Nutritious food.

Medical opinion was divided regarding the aetiology of Parangi, *i.e.* syphilis, lupus, scrofula, and leprosy developing late as a "degeneration" of that particular disease. Gavin Milroy, reading the Loos Report at the Colonial Office in London, established that Parangi and yaws were identical conditions. His correspondence and papers on this subject are recorded in the Kynsey Report. His report was published in the *Medical Times or Gazette* (November 11, 1876; February 17, 1877; November 23, 1878).

Hospitals were provided by the Government during a period of years in the various parts of the Island for the treatment of Parangi patients, and Parangi wards were opened in existing hospitals. The disease continued to be prevalent in several parts of the country to a greater or a lesser extent for many years.

Castellani (1905) discovered the spirochaete of yaws and gave it the name *pertenue*. In 1910 Ehrlich introduced arsenic for the treatment of syphilis. Arsenical preparations were made available to hospitals about 1919–1920, as supplies were not available during the first world war (1914–1918).

In 1922 the Committee "appointed to inquire into and report upon the prevalence of Parangi in Ceylon, with a view to making adequate provision for coping with the disease" (Ceylon Sessional Paper XV of 1922) made the following recommendations:

- (a) That a map showing the infected areas in each province be prepared;
- (b) That compulsory notification through the headmen and compulsory treatment in declared areas, under the Quarantine and Prevention of Diseases Ordinance, be instituted;
- (c) That a senior medical officer and a further four "itinerating" medical officers, in addition to the three already employed, be provided;
- (d) That ample supplies of neo-salvarsan or similar drugs be provided.

In 1923, R. L. Spittel, F.R.C.S.(Eng.), a member of the Parangi Committee, wrote:

"Framboesia is now endemic in Ceylon, and flourishes best, not in the large towns and highways of civilization where it is practically unknown, but in the remote villages and scattered forest settlements of the Wanni, where for generations it has had a permanent home. Perhaps more from the condition of life than geographical peculiarity, the disease is not

prevalent in the higher and colder regions of the central mountain massif. It hardly ever attacks the European or, for that matter, any clean-living individual, whatever his race.

"In Ceylon the disease is endemic in scattered jungle villages five to ten miles apart. To ask the villagers to foregather at central injecting stations is to expect too much of folk constrained to glean a scanty living from day to day. Besides, even if they came, there would always be left behind a decrepit remnant too ill to travel, who would serve as nuclei that perpetuate the disease. There is but one way to meet the problem, and that is by sending out medical men, equipped for travel, to inject these people in their homes. Itineraries are planned by which a string of villages is visited to and fro about four to six times according to the prevalence of the disease. When one area has been dealt with, another is begun, and thus whole districts are systematically treated. This scheme, supplemented by treatment centres, is now at work in Ceylon, and gives every promise of considerably mitigating the scourge."

The number of Itinerating Medical Officers was gradually increased until there were thirteen in 1929. Treatment was also made available in more and more hospitals.

This "Parangi Campaign" to control yaws in Ceylon was so successful that in 1931 the Principal Medical Officer was able to report that "it has almost eliminated this disease from most parts of the Island and it was possible, therefore, at the end of 1930, to withdraw the Itinerating Medical Officers from districts where it (yaws) had ceased to be endemic".

The work of the Itinerating Medical Officers is considered to have been largely responsible for the decline in the reported prevalence of yaws. They carried out onerous duties in most trying conditions, camping out in jungles not free from the danger of wild animals. However, only cases showing lesions were treated and although three to four injections of arsenic at weekly intervals had been advocated, most patients did not receive even so many as three. The contacts and latent cases were not treated, as the need for this was not appreciated at that time.

With the outbreak of the malaria epidemic in 1935, the Itinerating Medical Officers were absorbed in malaria control work, and in 1936 the health services were reorganized with the institution of a "Health Unit" system. Medical Officers of Health were appointed to urban areas, and rural areas were staffed with "Field Medical Officers", *i.e.* medical officers with no special public health qualification. The work of the Itinerating Medical Officer was continued by the Field Medical Officer in the yaws endemic villages.

In 1937 the Director of Medical and Sanitary Services requested that all yaws cases be recorded on a card and every case be inspected at 6-monthly intervals. Two Itinerating Officers were appointed to areas not served by Field Medical Officers where Parangi was still prevalent.

In spite of all these measures, cases continued to be reported. They were reported as infectious and non-infectious according to the clinical lesions, but in the absence of serological surveys the figures were probably unreliable.

In July, 1953, the writer was made responsible for the eradication of yaws in Ceylon. A questionnaire was sent out to medical officers in areas where the disease was formerly known to be endemic. Clinical and serological surveys were carried out from 1953 to 1959 in villages where the incidence was reported to be highest. The surveys revealed a very low sero-positivity and the absence of early infectious yaws in these areas. It is possible that year after year inactive cases of yaws were reported over and over again.

Compared with other tropical countries, Ceylon has been well staffed with medical and para-medical personnel and very well provided with medical institutions at the periphery. This has been accomplished over a period of years. The expenditure of the Health Department from 1900 to 1950 was graphically recorded on p. 8 of "The Health of the Nation", published by the Information Department for the information of the W.H.O. Regional Committee, which held its third session in Kandy in September, 1950. This expenditure per capita has risen from 36 cents in 1900-01 to Rs 9.17 in 1949-50, and there has since been a steady rise to Rs 14.54 in 1958-59, and Rs 14.45 in 1959-60. This increase has brought medical attention almost to the very door-step of the average villager in Ceylon.

Further proof of the gradual improvement in the health conditions in Ceylon is indicated in the following vital statistics taken from the Registrar-General's reports:

Year	1901-1910	1911-1920	1921-1930	1930	1940	1950	1958
Birth Rate per 1,000 population	38.0	38.2	39.5	39.0	35.7	40.4	35.8
Death Rate per 1,000 population	28.7	30.8	26.2	25.4	20.6	12.6	9.7
Natural Population Increase per 1,000 population	9.3	7.4	13.4	13.6	15.1	27.8	26.1
Infant Mortality rate per 1,000 live births	180.0	196.0	182.0	175.0	149.0	82.0	64.0
Maternal Death Rate per 1,000 births	9.0	17.7	19.8	21.4	16.1	5.6	3.9
Marriage Rate per 1,000 population	12.2	11.6	11.1	10.4	10.6	13.0	6.1

Moreover, the average life-span in Ceylon, which was 31.70 years in 1920-22, had lengthened to 56.85 by 1955. With the control of malaria there has been a reduction in infant and child mortality. The population of Ceylon has been rapidly increasing since about 1946. In the past the yaws endemic areas in the Dry Zone were also malaria-stricken. To-day, however, major colonization schemes have been undertaken or are in progress in those areas. Resettlement of population has been made possible, and the very low sero-positivity recorded in the recent serological surveys show that yaws has receded from those districts.

II. SOCIAL AND OTHER FACTORS

(1) *Use of Soap*.—It is interesting to note that soap was first imported into Ceylon as early as 1850 (Ferguson's "Ceylon Hand Book and Directory, 1898-1899", p. 608). Soap was imported to the value ranging from Rs 8,860 in 1850 to Rs 188,804 in 1895. From 1865 to 1892 small quantities of soap were manufactured and exported from Ceylon.

The bathing habit was well known from ancient times to "cool the system" according to the native medical practitioners. When they used mercury for the treatment of Parangi and various skin ailments, "when the mouth is becoming affected, the patient is desired to bathe every morning at sunrise for seven days by way of cooling the system" (Kynsey Report, Appendix A).

In the Customs returns it is recorded that soap was being imported into Ceylon in increasing quantities until about 1940-41. Two firms established the local manufacture of soap in Ceylon during 1938-40, and several other mushroom soap-manufacturing firms have been established since then. The per capita consumption of soap may be considered as one of the indices of the cleanliness of a nation. "The extreme variation in soap usage throughout the world may be seen in the per capita consumption, which ranges from 25 lb. in the United States of America, 28 lb. in the United Kingdom, and 5.7 lb. in Russia, to 0.12 lb. in China" (Encyclopaedia Britannica, p. 587). In Ceylon the per capita consumption in 1937, calculated on the basis of the population and the total quantity of soap imported, was 1.27 lb., but it has since risen from 1.12 lb. in 1943 to 4.23 lb. in 1961. Recent surveys carried out all over the Island in a sample covering 1,052 households showed that 99 per cent. of the population use some kind of soap for toilet purposes. It would be interesting to obtain comparative figures from other tropical countries where the problem of yaws still persists.

(2) *Improved Water Supplies.*—"The Ancient Irrigation Works in Ceylon", published by R. L. Brohier, a former Superintendent of Surveys, gives a very interesting description of the achievements of the Sinhalese kings in providing large irrigation schemes 2,000 years ago. But war, pestilence, and famine throughout the centuries have contributed to the general neglect of these ancient water works.

The decay of nearly eight centuries can still be seen in several parts of the Island, but some have been repaired since the beginning of the 19th century.

Dr. Loos and other colonial surgeons as well as the civil administrators reported in 1868-79 that the people used water from stagnant tanks; they recommended the immediate repair of some of them to give better water supplies for personal use as well as for irrigation.

The average villager, formerly reputed to be dirty and unwashed, is seen to-day to be clean, and he bathes every evening after his day's work is over.

(3) *Social Stigma of Parangi.*—In 1927, Dr. Bridger, Principal Civil Medical Officer, stated that "the attitude of the villager towards the disease appears to be changing. It is no longer looked upon as incurable, a disease that must come to a person sooner or later. In some districts villagers have begun to think it a disgrace to have Parangi."

To-day there is a great stigma attached to the disease, except perhaps in an isolated village where a few cases or relapses of hyperkeratoses may occur. In other areas the patient's family is avoided by the rest of the people who recognize that the disease is contagious.

(4) *Improved Communications.*—The extensive road system in Ceylon is now recorded in the Motor Map of Ceylon (1961). Between 1803 and 1820 there were about 900 miles of roads, mainly sandy tracks or natural tracks through the forests, jungles, and open country. In 1820 a Director for the Construction of Roads was appointed, and by 1832 there were about 1,150 miles of vehicular tracks. In 1833 the Public Works Department was formed for the construction of roads and all other engineering projects. This is still the chief department for the maintenance and construction of roads in the Island.

By 1900 about 3,600 miles of motorable roads had been constructed. The road system at the beginning concentrated itself in a network around the chief towns of the Island and later spread out to the suburbs. Roads in the suburban areas were constructed by the local bodies as well as by the Public Works Department. In this way it was possible to extend the network of communications deeper into the remoter parts of the Island.

In 1940, the Public Works Department maintained approximately 5,800 miles of road, and by 1950 the figure had risen to 6,650. In 1951 about 4,500 miles of other roads were taken over and the mileage was increased to approximately 11,200 miles. The taking over of these roads which mostly led to remote villages and hamlets, the gradual increase of irrigation and land development projects, and the formation of local bodies responsible for the roads resulted in more and more highways being constructed, and by 1960 the total mileage of roads in Ceylon was approximately 45,550.

The improvement in the road system during the last 50 years means that every rural district is now accessible in Ceylon, unlike days gone by when beyond the road heads there were numerous inaccessible remote villages where yaws was endemic.

(5) *Geographical and Physical Features.*—Ceylon occupies an advantageous position compared with other tropical countries. It is a small island, only 25,332 square miles in area, its greatest length 270 miles, and its greatest width 140 miles. It is mainly flat land except for the central hills. There are no really impassable barriers and the very extensive road system has made nearly all parts of the island readily accessible to-day.

Conclusion

In 1881, W. R. Kynsey recommended the following scheme for the eradication of the disease (para. 55, Kynsey Report):

"Vigorous efforts for eradicating the disease should be made. Under the etiology of the disease, reference was made to the character of the people, the dwellings, etc. These points should in every case receive due attention. It will not be out of place to consider in this connexion the steps which have already been taken with this view, and the results which have accrued therefrom. Hospitals have been established for the reception and treatment of patients, and are situated in the heart of the country where the disease prevails. Medical aid is brought, as it were, to the doors of the people. The results have, however, not been of an encouraging nature, and point to the system of dispensary relief, so ably put forward by Dr. Loos, as unreliable and certainly not of lasting benefit. In the record of cases frequent reference is made to patients returning from time to time with the disease.

"This argues doubtlessly that the people are alive to the benefits of skilful treatment; but it argues also that hospital or dispensary treatment cannot, of itself, be viewed as sufficient for the eradication of the disease. Moreover, when the peculiar apathy of

the people is taken into consideration, the highly insanitary state of their dwellings, their relapse into all old habits which were so fruitful previously in producing the disease, there can be no doubt that hospital or dispensary treatment, unbacked by other means, is nearly useless in eradicating the disease, and only brings about a false state of security. For, relying upon hospital treatment, sanitation, cleanliness, etc., are set at defiance with the inevitable and lamentable result of a reappearance of the disease.

"The system of irrigating the country by restoring the ancient tanks, is absolutely necessary, and the eradication of the disease can be effected only by the march of civilization. Analogous instances we have in the disappearances of the Sibbens disease of Scotland, and Leprosy from most of the countries of Europe. That Parangi is a disease due to innutritious food and destitution, is beyond doubt. It finds a congenial soil among the indigent of the Vanni, a people remarkable for their ignorance of all matters relating to agriculture, for their apathy and helplessness. They rely solely upon slight efforts in cultivating the soil, the failure of a crop—a by no means unfrequent occurrence—meaning destitution and its accompaniment—disease. The remedy for this state is everything that will improve the material prosperity of the people and the land they live in. There should be no half-measures adopted, but a system of rational agriculture, presided over by a competent Commissioner, should be introduced and though many prejudices will have to be met and overcome, the people should be gradually weaned from their apathy, and brought to exert themselves so as to better their condition in life. Success may not be rapid, but it will eventually come, provided only the measures are enforced in no half-hearted manner or by persons wanting in energy. As a result of this, the condition of the people will necessarily improve, the food supply will not be inadequate or of doubtful quality, the supply of water will be better than at present, and gradually sanitation and the laws of health will come to receive due attention and recognition, and a civilized community in a prosperous locality be the result.

"Combined with the irrigation of the country, the restoration and building of tanks, and the enforcement of a rational system of agriculture, roads may be opened up so as to make the chief towns easily accessible to even the most remote; experimental gardens may be tried, and a reward offered to pioneer efforts in civilizing and cultivating hitherto inaccessible and little known regions. The various revenue officers of the Government will doubtless interest themselves in these matters, so likely to contribute to the prosperity of their agencies and the people under their immediate charge, and energetic action on their part in enforcing all matters referred to, with kind and considerate treatment and combined action on the part of the medical officers of the various districts in the treatment of the diseased, must necessarily bring about a state incompatible with the persistence of a disease which has decimated the land for the last century."

Summary

The development and improvement of irrigation works, the building of new and improvement of existing roads, and the spread of education and health facilities have directly or indirectly improved the conditions of the Ceylon villager. As a result, the living standards of the village community have markedly improved over a period of years. The above factors, in addition to the availability of modern treatment with the arsenicals and later with penicillin, have undoubtedly played an important role in the recession of yaws in Ceylon.

Diminution de l'incidence du pian à Ceylan

RÉSUMÉ

Le développement des entreprises d'irrigation, la construction des grandes routes, l'éducation générale, et l'augmentation des services sanitaires ont beaucoup amélioré le sort des paysans de Ceylan. Ces faits, avec l'arrivée des médicaments modernes, ont rendu possible la diminution de l'incidence du pian.