THE COLLAPSE OF THE RAJARATA CIVILIZATION

IN CEYLON AND THE DRIFT TO THE SOUTH-WEST

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A Symposium

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University of Ceylon
Peradeniya
1971

August 1971

Printed at Supra Printers, 75 Angunawala, Peradeniya

Introduction

Towards the end of the twelfth century Ceylon was heading into a time of troubles. After a century of brilliant growth, the energy that had founded the magnificent city of Polonnaruva, built the stupendous reservoirs in the Rajarata and hit back at the South Indians and the Burmese seemed to be slipping away. By the middle of the thirteenth century the great city had almost been abandoned, the kingdom of Polonnaruva had fallen and the wonderful hydraulic civilization of the Malvatu-Mahavăli valleys had come to its end. Possibly famine and malaria swept over the major part of the Rajarata in the fourteenth and fifteenth centuries and led to the depopulation of that area. By the end of the fifteenth century only the ruins of the old cities and the silted reservoirs remained as the stark reminders of the once flourishing Malvatu-Mahavăli civilization. By that time, the bulk of the Sinhalese population had drifted to the south-western parts of the Island while most of the Tamils had drifted to the north and east. This volume is concerned with these important processes in the history of Ceylon.

The purpose of this volume is to put together most of the published and unpublished writings in English on the fall of the ancient Sinhalese civilization and the drift of the Sinhalese population to the South-west. As this volume is intended to form the basis of a seminar to be conducted by the Ceylon Studies Seminar (University of Ceylon, Peradeniya), the editor does not intend to discuss here either the subject or the selections included in this volume. His only intention is to introduce the selections in as brief a manner as possible.

The first selection, part of an article written by Lucius Nicholls in the *Indian Medical Gazette* fifty years ago, is included here mainly because it is one of the earliest writings in which the suggestion is made that malaria was the prime cause leading to the decline of the ancient Sinhalese civilization (the same suggestion was made subsequently by John Still and V. Pearson and others). As the first part of the article, dealing with the history of the Sinhalese kingdom is full of factual errors, it has been left out of this selection.

Contents

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Preface

The present volume, which contains a collection of major writings on the theme 'The Collapse of the Rajarata Civilization in Ceylon and the Drift to the South-west', has been edited by Karthigesu Indrapala for a symposium of the Ceylon Studies Seminar of the University of Ceylon, Peradeniya. The Ceylon Studies Seminar was inaugurated in October 1968 with a view to encouraging inter-disciplinary studies by some members of the Faculty of Arts of the University of Ceylon, Peradeniya, and has since then attracted a wide measure of support from the academic community at Peradeniya as well as individuals and bodies outside the University. Papers from specialists engaged in research have been read before the Seminar at regular intervals, and the Seminar has sponsored several colloquiums, symposia, talks and addresses by distinguished visiting scholars at Peradeniya. The usual practice has been to mimeograph the papers presented to the Seminar, but on this occasion we have felt that the theme of the symposium would be sufficiently attractive to present the papers to the wider public in a published form.

The organisers of the Seminar would like to express their gratitude to the editor, who mooted the idea of a symposium on the theme of the Downfall of Rajarata; and it is he who cheerfully undertook the unenviable task of seeing the work through the press. To Indrakirthi Siriweera, who throughout unhesitatingly offered his assistance, we owe a special debt. To the following institutions and publishers, the Seminar would like to express particular thanks for permission to reproduce the respective papers:

1. The Ceylon Branch of the Royal Asiatic Society for 'The Decline of the Medieval Sinhalese Kingdom' by H. W. Codrington.

2. The Editor of the *Journal of Asian Studies* for 'The Ruin of Ancient Ceylon' by Rhoads Murphey (Copyright by the Association for Asian Studies, Inc.)

3. Amaradasa Liyanagamage for the excerpt from his book *The Decline of Polonnaruwa and the Rise of Dambadeniya*.

4. The Editor of *The Ceylon Journal of the Humanities* for 'The Ruin of Ancient Ceylon and the Drift to the South-west' by Michael Roberts.

5. The Editor-in-Chief of the University of Ceylon *History of Ceylon* for the extract from the chapter by S. Paranavitana.

And finally our thanks to Mrs. N. Hettiarachchi and Mr. K. Kumarasamy for the efficient preparation of a good part of the typescript.

Vijaya Samaraweera
Convener
Ceylon Studies Seminar

The second essay, by H. W. Codrington, was originally delivered as a lecture before the Royal Asiatic Society, London, in 1937 and published several years later (in 1960) in the *Journal of the Ceylon Branch of the Royal Asiatc Society*. This is not concerned with the fall of the Rajaratá alone, but deals with the Sinhalese kingdom of south-west Ceylon as well. The first part of the essay surveys the history of the Island from the seventh century to the beginning of the sixteenth century while in the second part an attempt is made to explain the causes leading to the decline of the medieval Sinhalese kingdoms.

The contribution of Rhoads Murphey, entitled 'The Ruin of Ancient Ceylon', originally published in the *Journal of Asian Studies* in 1957, is perhaps the first serious study of the subject. After a careful examination of the evidence of the literary and epigraphic sources and a comparison of the decay of the Sinhalese civilization with that of certain other Asian civilizations, the author analyses the causes of the fall of the ancient Sinhalese civilization.

The fourth selection is from a chapter by S, Paranavitana in the *History of Ceylon*, Vol. 1, part 2, published by the University of Ceylon in 1960. After reviewing the causes suggested by earlier writers for the decline of the Polonnaruva kingdom, the author elaborates on the theory advanced by Rhoads Murphey and adduces further reasons for the disintegration that set in in the thirteenth century. (The title of the extract is not the author's)

The fifth essay is an extract from A. Liyanagamage's work, *The Decline of Polonnaruwa and the Rise of Dambadeniya*. The author makes a re-assessment of the views expressed by previous writers and lays particular emphasis on the responsibility of Parākramabāhu for the decline

The sixth and the seventh selection are from unpublished theses submitted to the University of London. The sixth selection deals with the political aspects of the invasions from South India in relation to the abandonment of Polonnaruva, while the seventh tackles the more important subject of the breakdown of the reservoir system in the Rajarata.

In the final essay, the author presents a new explanation for the process of migration to the south-west that took place after the twelfth century. He draws attention to 'the haven provided by the wet zone and the potentialities it held out, potentialities which led the populace (and its leaders) to concentrate their attention on the South-west rather than to attempt a recovery of the civilization in the Dry Zone'. He argues that the 'decline of Ancient Ceylon . . . was not merely a story of its occupants being pushed out of the Dry Zone. It was a "push-pull" process'.

The editor wishes to thank Dr. Vijaya Samaraweera, the present Convener of the Ceylon Studies Seminar, for inviting him to edit this volume when he suggested to him that the existing writings on this subject could be put together as a useful symposium. He is grateful to his colleague Dr. W. I. Siriweera and to Mr. H. A. I. Goonetileke (Librarian, University of Ceylon) for helping him in various ways in the preparation of this volume.

ABBREVIATIONS

ASC.	Archaeological Survey of Ceylon.
CHJ.	*Ceylon Historical Journal* (Colombo).
CJSG.	*Ceylon Journal of Science, Section G* (Colombo).
Cv.	*Cūlavaṃsa*, ed. W. Geiger, I (London 1925), II (London 1927).
EZ.	*Epigraphia Zeylanica* (London and Colombo).
Hvv.	*Hatthavanagalla-vihāra-vaṃsa*, ed. C. E. Godakumbure (London 1959).
JAS.	*Journal of Asian Studies* (Ann Arbor, Michigan).
JCBRAS.	*Journal of the Ceylon Branch of the Royal Asiatic Society* (Colombo).
Pv. (2)	*Pūjāvalī*, 34th Chapter, ed. Mabopitiye Medhankara (Colombo 1932).
Pv. Tr.	*A Contribution to the History of Ceylon*, tr. from *Pūjāvalī* by B. Gunasekera (Colombo 1895).
RKD.	*Report on the Kegalla District* (Colombo 1904).
SII.	*South Indian Inscripitons* (Madras).
UCHC.	University of Ceylon *History of Ceylon*, I, pts. 1 & 2 (Colombo 1959 & 1960).

I

MALARIA AND THE LOST CITIES OF CEYLON*

LUCIUS NICHOLLS

Extensive and wonderful ruins of cities of an ancient civilisation are scattered throughout the large areas of forests of the north-central province of Ceylon. .. The discovery of the sites of these places which had become lost in the dense jungle was due to Lieut. Fagan and he wrote the first account of them to the *Ceylon Gazette* in October 1820.

.... I propose to suggest that malaria was the primary cause which initiated the decay of these cities....

It is not possible to fix any date when these cities were finally abandoned. They were not overwhelmed by a single great catastrophe. The energy to the people waned through many years and with it the tanks were neglected, and cultivation disappeared from large areas, and decay slowly insinuated itself throughout the cities and the forests crept in.

When the Portuguese at the beginning of the 16th century were obtaining a foothold in Ceylon, the art and culture of the people had sunk to a low level when compared to that which

* From Lucius Nicholls, *Malaria and the Lost Cities of Ceylon*, (reprinted from *The Indian Medical Gazette*, Vol. LVI, No. 4, April 1921) pp. 1-2, 9-13 Colombo? 192-.

is revealed by the ruins of the ancient cities, and the most populated parts of the island were the dry zone in the extreme north, the hill country in the centre, and the lands along the south and west coasts; and at the present day the population is aggregated to these parts, which are either non malarious or far less malarious than the rest of the country.

The historians of the past have been content to relate the events in sequence as they occur in the rise and fall of civilisations. They recognise that progress is the result of the mental and physical vigour of the people, and that decay is due to the acts of their competitors and enemies, and perhaps to a subtle enervation which arises because of their previous successes.

The theologian considers that the misfortunes of a people are brought about by an undue outcrop of wickedness which was originally imbued into them by the wrath of the gods.

A less obvious task falls to the lot of the scientist who would explain the riddle. He considers that it is due to some change in all the subtle forces of nature which has sapped the vitality of the people.

There is historical evidence to show that cold climates have become more temperate; the Danube to-day never freezes, yet in the time of the Romans their legions on more than one occasion marched across the frozen surface of this river. The rainfall changes — there are many places in Africa which were once fertile and supported towns and villages but to-day are within the desert. Such changes, needless to relate, would have a profound effect upon human affairs, but they have not taken place in Ceylon; for there are evidences to show that the climate and the rainfall are the same as in past times, such as the baths of Pollonnaruwa, the height of the sluices, washing-stones upon which the *dhobies* of those days washed the clothes, and steps leading to ponds; had the rainfall been more or less these structures would have been situated differently.

It has been shown by W. H. S. Jones and others that when ancient Greece was at her zenith there was little or no malaria

in the country; for had the disease been even less rife than it is among the degenerate and rural population of Greece at the present time, it would have received more attention from the writers of those days; but before the time of Hippocrates there are few references to the disease, but from then onwards there are accurate descriptions and numerous references to the malarial fevers; even the degeneracy produced by them was noticed. Ross states:—

"Hippocrates noticed that those who live in low meadowy and hot districts tend to be neither tall nor well built but stout, fleshy, dark-haired dark-coloured, bilious and wanting in courage and endurance."

There are many highly malarious areas in both Greece and Italy (such as around Lake Kopais) which when a cultured and war-like people dwelt upon them must have been free from malaria.

Diseases such as cholera and plague are terrible in their visitations; the majority of those who are infected die, a few recover, and in a few years the effects of an outbreak will have disappeared and leave behind no permanent damage upon the population.

It is very different in the case of malaria; the children of fever-stricken areas are in a continual state of ill-health and those who live grow to an enervated manhood. And the decay is persistent and accumulative through generations.

The north-central areas of Ceylon could not have bred or supported the vast numbers of the active race that built and developed its ancient cities had malaria existed there at that time, and the gradual fall of these people was due to the importation from India of malaria and possibly also of the anopheline mosquitoes, the conveyors of the disease. When once malaria was established the people and their culture would drift to the less malarious parts, and that is what has happened.

There is an example of the introduction of malaria to an island in recent times. The disease first appeared in Mauritius in

1866, and spreading up the velleys it threatened rural prosperity; but the application of the medical knowledge of the present day will probably save the Mauritians from a degeneracy which otherwise would have been their lot.

Historians such as Gibbon would have us believe that the people of a successful nation are debased by the luxury which results, but if I may be permitted to form a comparison between an individual and a nation, for one man who allows success to ruin, there are many thousands who decay under the ravishes of chronic diseases. And malaria is a racial disease as much as it is the disease of a single person, and it is far more likely to debilitate a race than the less obvious results of success or welfare.

The ruling classes may fall under the influences of luxury, even the middle class inhabitants of towns may be affected; but there has been no country in all history where the masses of the people and the rural population gleaned more than a bare subsistence.

The ancient cities of Ceylon owed their rise to the field labourers who built the tanks and cultivated the rice fields, for at this time the country was self-supporting; and it is probable that the decline commenced among the lower classes, and it is reasonable to suppose that the cause was a devitalising disease which impaired their energies.

It has been suggested that the fall of this civilisation was due to conquests of the Sinhalese by the Tamils, but if this were so, the latter would have occupied the cities and the lands of the former, and they made attempts to do this and failed and slowly drifted to the less fertile lands of the north of the island. This suggests that the cause was not inherent in the Sinhalese but in the land.

The history of ancient Egypt shows that various races dwelt at different times in the valley of the Nile and carried on the culture of their predecessors; but about the time of the Romans

the country had become less easy for colonisation, and their armies languished with disease, as did those of Great Britain in Greece and some parts of Palestine during the late war, and the cause in both cases was the same. Egypt may rise again to great heights, but at present not a single individual of the lower classes escapes from one or other of the three diseases, malaria, anchylostomiasis or bilharziasis, which are chronic debilitating infections.

2

THE DECLINE OF THE MEDIEVAL SINHALESE KINGDOM*

H. W. CODRINGTON

(A lecture delivered before the Royal Asiatic Society, London, on March 11, 1937. Published by permission of the Royal Asiatic Society of Great Britain)

The history of the middle ages in Ceylon is divided into two main periods by the Cola conquest and occupation of a great part of the Island, an occupation which lasted for the best part of 70 years from a date between 1001 and 1069/1070. The history of the Island being intimately connected with that of South India, an understanding of the political conditions prevailing in that part of the continent is essential. At the end of the seventh century, the beginning of the period under review, the Pallavas were predominant. They had, however, little to do with Ceylon beyond supplying the army which placed Manavamma on the throne. The three peoples or rather realms which traditionally divided South India between them were the Colas to the north-east with their capital in later times at Tanjore, the Pandyans south of them centred at Madura, and the Keralas on the west. It was the first two who were in constant contact with Ceylon.

* Reprinted from the *Journal of the Ceylon Branch of the Royal Asiatic Society*, New Series, Vol. VII, Part I, 1960, pp. 93-103.

The rise of one or the other to power as often as not was marked by an invasion of the Island.

The course of its history, apart from the usual squabbles among the princes, continued peacefully from the time of Manavamma at the end of the seventh century until the reign of Sena I (c. 825–845) when the Pandyans invaded the country and sacked Anuradhapura. The next king Sena II (c. 845–880) was asked for aid by a Pandyan prince and actually took the Pandyan capital, Madura. In the reign of Kassapa I (c. 908–918) the Colas rising to power under Parantaka I defeated the Pandyans and with them a Sinhalese army which had gone to their assistance. The Pandyan king was slain and his heir fled to Ceylon for help, but owing to dynastic dissensions this was not forthcoming, and he had to return to India leaving the Pandyan regalia with the Sinhalese king. This was about 918–9. About 942–3 Parantaka wishing to be crowned in Pandyan regalia, demanded the regalia and on his request being refused invaded the Island. The Sinhalese king retreated to Ruhuna and Parantaka after causing much destruction had to retire without accomplishing his object. The Sinhalese then destroyed 'the border of the Cola dominion'. This attack following on the retreat of the enemy may be explained by the fact that Parantaka had been hard pressed by the Rastrakuta king Krsna III. The next attempt at invasion by way of Nagadipa (the Jaffna Peninsula) was in the reign of Mahinda IV (c. 955–71) by 'Vallabharaja', apparently the Cola Parantaka II, whose general fell in Ceylon c. 959; the invasion was unsuccessful.

So far no very great damage had been done by the foreign incursions. The chronicles reckon 80 years of Tamil rule and date this from the second year of Mahinda's son and successor, Sena V (c. 971–81) This king murdered his general's brother with the result that the general rebelled, went to India, returned with an army, and though he allowed the king to retain his throne, 'made over the country to the Tamils', that is the mercenaries. Anuradhapura indeed was so full of these folk brought in by the general that Sena's successor Mahinda V found it difficult to govern; in his twelfth year the revenue being withheld he could not pay his hired troops, and on their rising fled to Ruhuna where he afterwards lived, the rest of the country being in the

hands of the Kerala, Sinhalese and Kannata or Canarese soldiers. Between 1001-2 and 1004-5 the great Cola king, Rajaraja I, took advantage of this state of affairs and conquered much of the Island. Ceylon, save for the remoter parts, was now a province of the Cola empire with its capital at Polonnaruva, surnamed in the Cola manner, Jananathapura. Rajaraja's successor, Rajendra Cola I (about 1017), completed the work by the capture of Mahinda, who spent the remaining years of his life as a captive in India.

Polonnaruva as Capital

Among the Sinhalese, anarchy prevailed. Finally the young prince Vijaya Bahu I (1056–1111) united the national forces, but it was not until civil war over the succession raged in the Cola country that he was able to expel the Tamils. This was about 1070. Polonnaruva now became the capital, and a temple for the Tooth Relic, the usual accompaniment of the royal palace, was built there. It may be noted that even in his efforts against the Colas, Vijaya Bahu was hamperd by rebellion About 1084–5 he was troubled by a serious revolt of the Velakkara (Tamil) mercenaries, who killed the royal generals and burnt the palace. The cause of this was the declaration of war by the king against the Colas, who had mutilated his ambassadors sent to the West Chalukyan king Vikramaditya. One of Vijaya Bahu's queens was of the Kalinga royal race; his sister Mitta married a Pandyan prince who became the grandfather of Parakrama Bahu the Great. The history of the forty odd years following the death of Vijaya Bahu is that of the dissensions of the rival Kalinga and Pandyan factions, the first named holding the 'King's country', while the rest of Ceylon was divided between Mitta's sons. Her grandson Parakrama Bahu ultimately ruled the 'Southern Country', which he did much to improve by the construction of irrigation works and by the reorganization of the military and civil department. Having consolidated his position in his own dominion, this ambitious prince attacked and deposed the titular king Gaja Bahu II and though not without resistance, ended in becoming sole master of Ceylon.

Parakrama Bahu (1153-86) built numerous monasteries and temples in the country and at Polonnaruva, which city he enlarged

and fortified, restored the shrines at Anuradhapura destroyed by the Colas, and also constructed considerable irrigation works in the vicinity of the capital. He appears to have unified the administration of the Island, which hitherto had been practically divided into three areas, the King's Country, the sub-king's principality, and Ruhuna, and also to have given attention to the military organization. He still, however, employed mercenaries. His rule was disturbed by rebellions in Ruhuna in his fourth and eighth year, that in the fourth giving him much trouble, and in the neighbourhood of Mantota, in his sixteenth. Externally the reign is distinguished for a naval expedition against Ramanna (Pegu) in 1164-5, caused by disputes as to the elephant trade, the maltreatment of ambassadors and the seizure of a princess sent from Ceylon to Cambodia. Of much greater and far-reaching importance was the war of the Pandyan succession. At some time after the Pegu expedition and before 1167-8 one of the rival princes, Parakrama Pandya, applied to his namesake of Ceylon, himself a Pandyan, for help. This was given and the Sinhalese at first were victorious under the general Lankapura. The *Mahavamsa* discreetly ends its account of the campaign here, but we learn from Cola inscriptions that before 1170-71 the Sinhalese had been defeated and the heads of Lankapura and other commanders nailed to the gates of Madura. The war did not end with this, but dragged on for years. According to Cola epigraphs, before 1175-6 the Sinhalese had been successful, but by 1181-2 had been driven into the sea. The Sinhalese hold on Ramesvaram at least seems to have continued for some time longer, as Nissanka Malla (1187-96) claims to have built a temple there. It is by no means certain that the war was confined to the continent as an Indian inscription states that the Cola forces devastated an area in the Island 20 leagues (*katham*) wide from east to west and 30 long from south to north.

Zenith of Sinhalese Greatness

The reign of Parakrama Bahu usually is considered as marking the zenith of Sinhalese greatness. But the drain on the resources of the Island must have been enormous. Under his successors decline was rapid and after the death of Nissanka Malla, a Kalinga

prince, in 1196, the real rulers were generals who set up puppet monarchs including two widows of Parakrama Bahu and an infant. Finally, about 1215, the last of these sovereigns was deposed by a vigorous invader, one Magha, a Kalinga, who descended on Ceylon with a large army of Keralas. He doubtless claimed the kingdom by inheritance from his Kalinga kinsmen who had reigned before, but he never identified himself as they had done with the national religion and remained to the end a foreign usurper and persecutor. He reigned for 21 years. The whole period including that of the puppet kings was known as the 'Tamil anarchy' (*Demala arajitaya*).

The Pundit King

The Sinhalese monarchy, when restored, had its capital in Dambadeniya in the present Kurunagala District. The second and the most important king of this dynasty was Parakrama Bahu II, the Pundit (1234–68). He continued his father's struggle against Magha and by 1244 had succeeded in recovering Polonnaruva. But he never got back the extreme north of the Island, and the medieval kingdom of Jaffna may be the remnant of Magha's realm We hear now for the first time of the Vanniyars, to whose care Parakrama Bahu entrusted Anuradhapura. These Vanniyars were chieftains, often semi-indipendent or even quite independent; they are found in later times not only in the North but in the East and South-East of Ceylon The effective northern frontier was commanded by the fortress of Yapahu, where one of the king's sons, Bhuvanaika Bahu, was stationed, the reason given being that the Tamils very often landed at Kuda Valigama (? Valikamam) in the Jaffna Peninsula. An invasion of the Pandyans, now the dominant power in South India, apparently between 1254 and 1256, is recorded in inscriptions found on the continent; in this one of the Kings of Ceylon (? he of Jaffna) was killed and the other rendered tributary. In Parakrama Bahu's eleventh year we hear of an invasion by one Chandrabhanu, a Javaka or Malay from Tambalinga, with blowpipes and poisoned arrows. He descended on the Island again during the reign with a mixed army of Pandyans, Colas and Malays and after over-running a considerable part of the North encamped before Yapahu, where he was defeated. This interesting invader,

who professed himself a Buddhist, has been identified by Mr. Paranavitana, Epigraphical Assistant in Ceylon, with Siridhammaraja of Siridhammanagara or Tambarattha, that is Ligor in the Malay Peninsula. Mr. Paranavitana suggests that the cause of the invasion was the desire to secure a famous image of Buddha known as the Sinhala image. Quite probably the invasion had permanent results. The names Chavakachcheri ('the Malay settlement') and Chavankottai (the 'Malay fort') at Navatkuli in the Jaffna Peninsula as well as Javakakotte on the mainland may record settlements of Chandrabhanu's followers. The first of these names occurs in the fourteenth century and the last in the fifteenth. Parakrama Bahu set the bad example of dividing the country among his sons, bidding them live at peace with one another.

Yapahu as Capital

The short reign of his successor and son, Vijaya Bahu IV, ended in a mutiny of the Rajput mercenaries in which he lost his life. The new king Bhuvanaika Bahu I (1271-83), whom we have seen in command at Yapahu, made this fortress his capital. His reign was marked by two invasions by the Pandyans and by a severe famine. The second invasion took place at the end of the reign; in it the Tooth Relic was carried off. It seems to have been followed by an interregnum of some twenty years. To this period perhaps may have to be assigned the Pandyan Temple (Siva Temple No. 1) at Polonnaruva and the magnificent staircase at Yapahu. The next Sinhalese king Parakrama Bahu III recovered the Tooth Relic by humbling himself before the Pandyan ruler and quite possibly by becoming his feudatory. But the powerful Indian monarchy now was near its end, as it fell before the Muhammadans in 1310; it was about this time that the Sinhalese capital was moved to Kurunagala. But Tamil ascendancy in Ceylon merely passed from one hand to another, the heir of the Pandya in this matter being the king of Jaffna. The trials of the Sinhalese were not confined to the north-western frontier; in 1344, when Ibn Batuta visited the Island, a Muhammadan pirate held Colombo with an Abyssinian garrison, and in 1349 or 1350 his power extended along the coast southwards, Marignolli, the papal envoy to China, being captured at Beruvala. In spite of this the Sinhalese kingdom was not in a

bad way judging from the fine temples built at Gadaladeniya and Lankatilaka in Kandy District and from the construction of an irrigation work on the Kospotu Oya.

Gampola Kings

The capital since 1344 or thereabouts had been transferred to Gampola, apparently for dynastic reasons rather than from fear of invasion. It is now that we often find the king crowning his successor during his lifetime; indeed the first two of the Gampola kings who seem to have been brothers date their accession from the same year. Their successors were feeble folk, and power was held by a series of mayors of the palace. Of these the greatest was Alagakkonara who put an end to the Jaffna ascendancy by hanging the Tamil king's tax-collectors. He had prepared for that monarch's vengeance by fortifying Kotte. This was before 1369-70. The very position of Kotte in the swampy country by Colombo is proof of the straits to which the Sinhalese had been reduced; it had its advantages however, if Alagakkonara relied on the Muhammadans of Malabar. Under the successors of the great mayor of the palace, the country fell from the position to which he had raised it and the last of his line was ignominiously kidnapped and carried off by the Chinese about 1409.

General Prosperity

Parakrama Bahu VI (1412-68), the first of the Kotte dynasty, raised the Sinhalese to a height never attained since the days of Parakrama Bahu II and never equalled since. The Island once more was brought under one rule. The chronological order of the wars by which this came about is obscure. The great event of the reign was the invasion and occupation of the kingdom of Jaffna, then a feudatory of Vijayanagar, which henceforth was governed by the prince Bhuvanaika Bahu, later on king. It was probably before this that the Vanniyars, the chiefs of the present Northern and North-Central Provinces, had been reduced to obedience. There is also recorded an expedition to Adrianpet in South India. In the Sinhalese country itself the up-country provinces which had rebelled were subdued and given over to a prince of the old Gampola family. A witness to the general

prosperity is the outburst of literature, in particular of poetry. But this prosperity was not to endure. The besetting sin of the dynasty was civil war, and it was this which led to its downfall. The up-country provinces became a separate Kingdom. Jaffna was lost, and the reign of its ruler Bhuvanaika Bahu VI as king was signalized by a widespread rebellion lasting several years.

Coming of the Portuguese

In 1505 the Portuguese 'discovered' Ceylon. They made a great impression on the inhabitants of Colombo and according to the *Rajavaliya* their report to the king ran thus: 'There is in our harbour of Colombo a race or people fair of skin and comely withal. They don jackets of iron and hats of iron; they rest not a minute in one place, they walk here and there; they eat hunks of stone and drink blood; they give two or three pieces of gold and silver for one fish or one lime; the report of their cannon is louder than thunder when it bursts upon the rock Yugandhara. Their cannon balls fly many a gavuva and shatter fortresses of granite'. The then reigning king made the fatal mistake of raising his two sons to the throne and dividing the country. One of these, Vijaya Bahu VII (1509-21), managed to make himself sole ruler, but lost his throne and his life at the hands of his sons, who proceeded to carve up the country between them. It was their quarrels which led directly to the intervention of the Portuguese.

Causes of Decline

We have now made a rapid survey of the history of the mediaeval period. It is a series of ups and downs. The general trend, however, at least from the death of Parakrama Bahu I, was one of decline. We may now consider this move in detail, though at the expense of some repetition.

Firstly, the source of weakness in the foreign elements in the population. In the last days of the Sinhalese monarchy what may be called the regular army as opposed to the militia or local levies consisted largely of Malays and other foreigners such as disbanded soldiers of Tipu Sahib. This reliance on mercenaries

goes back well into the middle ages and perhaps earlier still. In the ninth and tenth centuries we find setlements of Tamils, in most cases probably Tamil soidiers, mentioned in inscriptions; they were under a Demaladhikari. The trouble with these troops was their latent sympathy with their kinsmen in South India We have already seen under Sena I that they joined the Pandyan invader. Under Sena V and his successor Mahinda V we get more details; the paid troops then consisted of Keralas from Malabar and Kannatas or Canarese as well as Sinhalese. It was to them that the general, whose brother Sena V had slain, made over the country; they filled the capital and when Mahinda fled to Ruhuna they ruled the rest of Ceylon. It was this state of affairs which invited the Cola invasion of Rajaraja I.

Continuance of Mercenaries

On the recovery of the country by the Sinhalese the employment of mercenaries was continued. Under Vijaya Bahu I a serious rebellion of the Velakkara force broke out, caused by their being called upon to fight against the Colas. Under Parakrama Bahu I the name Agampadi first appears, the name later on applied to this class of troops; it is that of a South Indian caste and also of sub-divisions of the Maravars, the warlike tribe which caused so much trouble to the British at the end of the eighteenth and beginning of the nineteenth century. In the reign of Nissanka Malla, we find the Agampadi under the control of the provincial governors, and they appear on and off henceforward under this designation down to the time Parakrama Bahu VI of Kotte. Vijaya Bahu IV of Dambadeniya was murdered by his Rajput mercenaries. Somewhat later Marco Polo speaks of 'Saracens', that is Muhammadans, as being employed by the King of Ceylon.

'Tamil Time'

There also was a steady stream of immigration from South India through the port of Mahatittha (Mantai) with the result that the neighbouring country eventually became entirely Tamil. It is noteworthy that, while many Sinhalese place-names remain more or less disguised in the Jaffna peninsula and in the Eastern Province

now Tamil, this is not the case in the country behind Mannar; there these names are purely Tamil. This area indeed with its great Hindu shrine, Tiruketisvaram, seems to have been the nucleus of the later mediaeval Tamil kingdom of Jaffna; to its end its kings styled themselves 'Setukavalan', 'guardian of Adam's Bridge'. The Vanniyars have been already mentioned; they appear first in the thirteenth century. In more modern times they had often become Sinhalese, but the title seems to connect them with the Maravars. It is to be noted that Knox in his flight from captivity in the seventeenth century found the country beyond Anuradhapura still inhabited by Tamils. At a much earlier period, the tenth century, the Mihintale Tablets laying down regulations for the monastery there refer to the 'Tamil Time', seemingly a time when a Tamil community of bhikkhus was in possession. We may note that at the present day two of the most important castes in the Sinhalese low-country are undoubtedly of Tamil or at least of South Indian descent.

Trade and Foreigners

Trade from time immemorial had been in the hands of the foreigners. These formed powerful communities and in the time of Nissanka Malla the principal merchants sat in the king's council at Polonnaruva, doubtless under their head the Situna. In addition to the capital they were naturally found at the ports; of these in early times the most important was Mahatittha. But this later on, apparently after the thirteenth century, yielded the primacy to Colombo. This last always was a foreign town largely inhabited by Muhammadans who can be traced there as far back as 949. The activities of these merchants are illustrated by the presence of gold coins of almost every Muslim dynasty from the eighth to the fifteenth century, but in particular those of the twelfth and thirteenth, in the country lying between Colombo and the Kandyan hills. The financial and so the political, power of the Muhammadans was real, if concealed. One in the thirteenth century was the power behind the throne in the Pandyan empire when at its zenith. In the next century Colombo was even the centre of an independent principality with Kotte as its fortress on the land side. While on the subject of foreign trade the Chinese should not be forgotten; their coins from the tenth to

the thirteenth century have been turned up at various sites including Polonnaruva, Yapahu and Tiruketisvaram (Mantai) in fairly large numbers, and their ships still visited Ceylon in the fifteenth century when they carried off the ruler Vira Alakesvara.

Effect of Immigration

To sum up, foreign immigration led to the supersession of the Sinhalese by Tamils in the present Northern and Eastern Provinces, and at one time in much of the North Central Provinces. This supersession was largely peaceful but in the long run was prejudicial to Sinhalese rule By the end of the period under review, there was an independent kingdom of Jaffna, while between it and the Sinhalese and again on the east of the Island the real rulers were Vanniyars on whose allegiance, especially in the north, too much reliance could not be placed.

Connected with trade is coinage. In the early mediaeval period, that is before the Cola conquest, payments were made by weighing out gold, doubtless as in South India of a certain standard. In the ninth or tenth century or perhaps earlier there was issued a gold coinage, which was intended to be and actually was at first one half of gold and one half of alloy. The years before the Cola conquest apparently saw a reduction in the fineness of the coinage and Rajaraja I continued the same standard. Under Vijaya Bahu I the coin was of silver or of gold so debased as to be hardly distinguished from silver. After his reign this ceases to be issued, and under Parakrama Bahu I and his successors at Polonnaruva, Dambadeniya and Kurunagala the old principal coin had become of base metal or copper. In the time of Parakrama Bahu IV it is frankly admitted that the *masuram* or 'gold coins' mentioned in the Jatakas are not those now in use made of base metal. Later on fanams of poor gold on the Indian model were issued; they are mentioned in the fourteenth century. The debasement of the coinage is symptomatic of the decline of the State.

Administrative Decay

In the matter of general administration we also find decay. The inscriptions of the ninth and tenth centuries, though giving

little detail, obviously refer to a complicated system of Government, which had disappeared by the time of the arrival of the Portuguese. The records of Nissanka Malla luckily provide us with some information touching the main source of revenue, the grain tax. This king prides himself of reducing the inordinate demands of Parakrama Bahu I and gives us the amount which he himself has fixed. Now by the time of the Portuguese the Sinhalese districts of Ceylon were in sharp contrast with the rest of the East in having no general grain tax. By that time the public dues usually consisted of service, the village being held by hereditary or quasi-hereditary heads who were responsible for this and who took to themselves what was left of the old grain tax. It seems clear that the old complicated revenue system had become impossible owing to the impoverishment of the country. The very names connected with it passed from memory.

Decline in Cultivation

Closely connected with the revenue was agriculture. The disappearance of the grain tax led automatically to a decrease in the area cultivated with paddy, as indeed happened after the abolition of the British grain tax in 1892, and an increase in the shifting 'chena' cultivation. This last certainly existed in the period when the grain tax was paid but, as still in Travancore, must have been kept within bounds by the fiscal needs of the Crown. The irrigation works of Ceylon are the outstanding achievement of the Sinhalese. The last great ones are those of Parakrama Bahu I. Thereafter in the period under review the only work undertaken seems to have been an anicut on the Kospotu Oya in the time of Bhuvanaika Bahu IV.

Why Tanks were Abandoned

The account of Parakrama Bahu's suppression of the great Ruhuna rebellion in 1156-7 gives no indication that the low-country of Uva and the south-east of the Island was anything but populous. All the evidence is to the contrary. In Plancius' map of 1592, however, the following entry in Portuguese occurs: 'Kingdom of Jala deserted and depopulated for 300 years by reason of unhealthiness'. This 'kingdom' is Yala in the south-east

of Ceylon. The entry would seem to refer to the appearance of malaria towards the end of the thirteenth century. About this time the chronicler mentions a great famine in the Island; in the reign of Parkrama Bahu II somewhat earlier in the century there had occurred a great drought. Anuradhapura by this time was practically abandoned (it had been destroyed by the Colas) and Vijaya Bahu IV at the end of his father's reign had to clear the holy places of jungle. This and the fact that the Government of the northern part of Ceylon (exclusive of Jaffna), was then in the hands of the Vanniyars tend to show that this region had ceased to be of importance. Indeed we now hear nothing of the old irrigation works. It is usual to attribute the breakdown of the old tanks and channels to the ravages of the Tamils. This charge, however, can hardly be brought with any justice against the Cola administration of the conquered province of Ceylon; it clearly was in the interest of the revenues to maintain these works. The great tanks were still functioning in Parakrama Bahu I's reign though needing repairs, and its seems probable that the real cause of their decay and abandonment was the same as that which depopulated the south-east namely, malaria. The first attack of this scourge must have been severe. It is possible that the Tamil inhabitants found there later entered an almost deserted region; it is certain that the present population there is not descended from the older mediaeval one, as the ancient village names have disappeared, the existing ones being modern.

Decay in Stonework

Symptomatic of decay is the history of architecture. Mr. Hocart, late Archaeological Commissioner, is of opinion that 'in the ninth or tenth century stonework attained its zenith of excellence: it was rich but with taste, there was a finish about the work which was subsequently much impaired and eventually was completely lost' (Codrington, *Hist. of Ceylon*, p. 185). We may notice that this period of excellence coincides with the best age of the coinage and with a sudden efflorescence of inscriptions. At Polonnaruva, on the other hand, if we except the Cola and Pandyan work, brick is chiefly to be seen. Vijaya Bahu IV when restoring this capital left this illuminating epigraph on Parakrama Bahu I's Lankatilaka (the so-called Jetavanarama): 'Parakrama Bahu, lord

of Lanka, caused Lankatilaka to be built... A hundred years have elapsed since it, the ornament of the earth, fell into ruin; the puissant Vijaya Bahu, lord of the earth, thoroughly restored it'. This was about 1268; if we take the inscription literally, if follows that the Lankatilaka had fallen into ruin in the lifetime of its builder. Whether this be so or not (I believe that I am right in saying that the Polonnaruva buildings have very slight foundations), the poverty of the time is shown in the case of the Tooth Relic Temple at Dambadeniya. It was built by Parakrama Bahu II but needed repair before his death. Exception to the dearth of buildings is the great staircase at Yapahu (if this be Sinhalese and not Pandyan work) and the fourteenth century temples of Lankatilaka and Gadaladeniya in Kandy district; the first of these two however, as we know from records, was built by Tamil craftsmen. The last buildings of any note were those of Parakrama Bahu VI of Kotte.

Conclusion

The conclusion which we reach is that the zenith of Sinhalese prosperity in the middle ages was in the ninth and tenth centuries. Then came the Cola conquest. the brilliant episode of Parakrama Bahu I, and then with occasional revivals, a period of continual decay. It will be seen that the prosperity practically coincides with a period when there was no very strong power in South India. The Pandyan invasion under Sena I is an isolated event, and Parantaka I's career, luckily for Ceylon, was checked by the Rashtrakutas. Whether the weak Mahinda V would have been able to stand against Rajaraja I even had his mercenaries been true to him, is problematical in view of the defeat of Sena I by the Pandyans. The fatal mistake of the Sinhalese monarchy was its reliance on foreign mercenaries. Vijaya Bahu I and Parakrama Bahu I were strong enough to resist their enemies; their successors were not, whenever a really powerful prince chose to exert his full strength. Fortune also was against them. Parakrama Bahu I, in spite of his brilliance, left them a state crippled with the heavy taxation necessitated by his many buildings and his interference in India. The war thus begun could not be stopped with the same ease Then came the puppet kings, Magha's conquest, the Pandyan invasion, apparently followed by prolonged occupation,

and when the Pandyan power had been broken by the Muhammadans in 1310, the overlord ship of Jaffna. The Sinhalese State never recovered from impoverishment caused by Parakrama Bahu I's grandiose schemes. On top of the political troubles was the advent of malaria which threw out of cultivation the old rice producing region with its great tanks and channels and reduced the population of the kingdom. To all this must be added the incurable inability of the Sinhalese to work together. Even when Vijaya Bahu I was struggling for the national existence against the Colas he was hampered by rebellion; we find more than once the Sinhalese regular troops siding with the foreign mercenaries; it was the internecine fights among the royal family which led directly to the Portuguese conquest.

3

THE RUIN OF ANCIENT CEYLON*

RHOADS MURPHEY

The study of abandoned civilizations, and of the reasons for the disaster, is a field in which many imaginations have wandered. In several parts of South-east Asia, notably in Cambodia, northern Siam (the Kingdom of Haripunjaya), the Pagan area in the dry zone of Burma, and the dry zone of Ceylon, this pattern has been repeated. Only in Ceylon is there a more or less continuous historical record, plus numerous stone inscriptions, to assist in solving the puzzle. Otherwise the cases are suggestively alike. All arose on reasonably level plains (often the only level land in the region), in a climate of alternating wet and long dry seasons, which especially in tropics usually means irrigation if agriculture is to be productive enough to support a more than primitive civilization. All did in fact depend heavily on extensive irrigation, and appear to have shared the characteristics which Wittfogel has associated with this kind of basis: a strong central state, massive public works, a highly structured society, and a powerful ramified bureaucracy. All were plagued with chronic invasions from nearby densely populated areas, and all collapsed with dramatic suddenness, to be blotted out by jungle so that with some even their memory was forgotten. Finally, all were abandoned at about the same

* Reprinted from the *Journal of Asian Studies*, Vol. 16, No. 2, Feb. 1957, pp. 181-200.

period, the thirteenth century (Angkor Vat somewhat later), and with few exceptions no significant attempts were made to re-occupy them until very recent years. The high productivity of all of these places until the thirteenth century is emphasized by the impressive stone ruins which remain, evidence of a large agricultural surplus; presumably they could be made productive again. What was the basis of their ancient greatness? What led to their abandonment? Why were they never reoccupied? It is proposed to examine the case of Ceylon, partly for its own sake, and partly with the hope of throwing some light on the other similar cases. The written historical record, the studies of many others in Ceylon, and the growing body of precise geographical information about the Ceylon dry zone make it the most workable problem. The present article is largely an assembling and critical review of the considreable work which has been done (most of it well known to students of the field), toward a more complete answer to the questions posed above. In addition, Ceylon has undertaken, especially since 1945, an extensive program of development and colonization of its dry zone areas where the ancient Sinhalese kingdom once flourished. Jungle has been cleared, ancient works rediscovered and restored, and the irrigation and agricultural problems with which the ancients wrestled have been tackled on a large scale.

It seems necessary first to outline the geographical and historical background of the ancient civilization and its thirteenth-century collapse, even though this is familiar ground for South Asia specialists. The dry zone occupies over two thirds of the island, or approximately 18,000 square miles. The line separating it from the wet zone is generally taken to coincide with the line of 75 inches annual rainfall. This may seem a great deal of rain for an area entitled dry, although a general average for most stations within it would be about 60 inches and there are two districts (Mannar and Hambantota) with much lower totals. But average annual rainfall figures are often seriously misleading, and in fact 60 inches still leaves the dry zone inadequately watered for field crops, due to the uneven seasonal distribution of the rains, their generally violent character and consequently high runoff from hardpacked tropical soils, high yearly variation, and high evaporation rates in a climate where temperatures vary little through the

year from an average in the low 80's.[1] High constant temperatures and insolation are advantages for the growing of rice and in this respect dry-zone conditions approach the optimum. A further advanatage, scarce in the wet zone and of course a major aid to rice culture, is the gentle relief. The dry zone is broadly speaking an undulating plain, a succession of small shallow stream valleys and low interfluves; this makes irrigation more difficult than in a single great river basin or on a really flat plain, but it is far more favorable for rice than the wet zone. While the soils are not naturally very fertile, they are not an important negative factor in the growing of paddy, as will be seen in more detaial later. All the above physical characteristics, with relatively minor differences, apply to the other ancient sites in South East Asia mentioned earlier.

Dry-zone rainfall is derived primarily from the northeast monsoon, which blows over Ceylon from late October into January. About 80 per cent of the annual dry-zone rainfall occurs in the hundred days between October and January, but even this period may witness disastrous dry spells. Soils are highly porous and shallow, and impervious bedrock is only one to fifty feet from the surface, so that groundwater resources are slight and cannot be depended on, with few local variations, for the support of agriculture. The Jaffna peninsula in the north, underlain by limestone strata, is an exception and supports an intensive agriculture mainly from wells, aside from the largely rain-fed rice[2]. Until the the thirteenth century the Ceylonese[3] found the

1 For a thorough discussion, see B. H. Farmer, "Rainfall and Water Supply in the Dry Zone of Ceylon", in *British Tropical Lands*, ed. C. A. Fisher and R. W. Steel (London, 1955); also P G. Cooray, "Effective Rainfall and Moisture Zones in Ceylon", *Bull. Ceylon Geog. Soc.*, III, No. 2 (1948) 39-42. I am very grateful to many people in Ceylon for help on this study, but especially to E. F. L. Abeyratne, B. H. Farmer and C. W. Nicholas.

2 See the studies by Farmer and Cooray cited in n. 1.

3 Ceylonese, an inhabitant of Ceylon; Sinhalese (Singhalese), the largest ethnic and linguistic group among the population, speaking an Aryan language and possibly descended from Aryan-speaking invaders who reached Ceylon about the sixth century B. C. (or possibly much earlier), but including Dravidian and other strains as well; Ceylon Tamil, the largest minority, immigrants and invaders from South India who settled in Ceylon from at least the tenth century A. D.; Indian Tamil, in Ceylon the recent immigrants (since about 1850) brought to work the coffee, tea, rubber and coconut estates.

dry zone, despite its difficulties, a more attractive and productive place than the wet zone, which they largely avoided except when they temporarily needed the military security of its hills and forests in the face of Indian invasions, and which they peopled with savages and demons. After the thirteenth century, military reverses and the subsequent abandonment of the ancient dry-zone sites forced them into the wet zone, where they were never able until the nineteenth century to approach the economic, political, or cultural level achieved in the dry zone. It is clear not only from this experience but from modern study that where irrigation is possible the dry zone is agriculturally a more productive place than the wet zone, due principally to climate and relief. But until a few years ago the Ceylonese turned their backs on it. Much the same kind of shift took place in Cambodia, Siam, and Burma, from the original dry-zone center to a heavily forested and (at the time) less productive wet zone, and it was accompanied by the same about-face in attitudes. To say that the irrigation works were destroyed and the people driven out by invasions does not explain why the invaders made no use of the areas they conquered, or why the original inhabitants made no subsequent significant attempts to reoccupy them. In Ceylon after 1850 much of the wet zone was transformed into a highly profitable plantation economy (predominantly tea, rubber, and coconuts) and its population subsequently boomed; tree crops are well suited to its hills and hot, wet lowlands, and even though Ceylon faced and still faces a large food deficit, the new export crops could support the economy. In Lower Burma, Lower Siam, and Cochinchina too, the second half of the nineteenth century saw a clearing of the forests, draining of swamps, and a tremendous increase in rice production, under British or French direction or capital. But this was many centuries after the original retreat into the wet zone, and was essentially dependent not only on Western direction and capital but on the development and accessibility of new world markets for the new commodities. Until the nineteenth century these places almost certainly supported a smaller population and on much lower scale than the dry zones in the days of their greatness.[1]

1 Ceylon's total population toward the end of the Dutch period (1789) was estimated at 817,000. More accurate counts by the British showed 862,000 in 1824 and 960,000 in 1831 (S. G. Perera, *The British Period 1795–1948*, 6 th ed. (Colombo, 1951.) p. 85). Even by 1789 population increases had doubtless resulted from the cinnamon and general trade stimulated by the Portuguese and Dutch. The ancient population is estimated below at between two and four million. Ceylon's population in 1956 is approximately 8, 800,000.

The written-history of Ceylon begins with an account of the landing of Vijaya, an Aryan-speaking prince, and his seven hundred followers somewhere on the northwest coast about 543 B. C., although both the date (which was artificially fixed) and the story are of later origin and border on legend. They are found in the Sinhalese (Pali) chronicle, the *Mahavansa*, not an ideal historical source, but providing with its later sections, the *Culavansa*, a more or less unbroken narrative from the sixth century B. C. to the end of Sinhalese independence with the absorption of the remnant Kandyan kingdom by the British in 1815[1]. It was written by a succession of Buddhist monks between the sixth century A. D. and 1877, and is primarily a record of the pious achievements of the kings. As a chronicle of glorification its contents are selective, but few countries have such a continuous historical record, whatever its shortcomings. The pre-Aryan inhabitants were probably familiar with irrigation, at least on a small scale in the form of tanks for storing rain water; onto this foundation were grafted new irrigation techniques which the invaders brought with them, possibly directly or indirectly from western India or the Ganges valley and from the tank country of South India, where physical conditions are very similar to the Ceylon dry zone. It is a site broadly consistent with others where early city civilizations arose (the Nile and Indus valleys, Mesopotamia, and North China): plains, a dry climate, and seasonally flooding rivers.

By at least the first century A. D. large-scale irrigation works were built, and until the thirteenth century it could be said that nowhere else in the pre-modern world was there such a dense concentration of irrgation facilities at such a high technical level. The essential problem was to provide insurance against drought during the northeast monsoon for the maha ("great season") crop, and to store for as long as possible the rain which did fall during that period, for use during the remainder of the year. Two general solutions, applied together, were employed: the storing of rain water in tanks, whose size varied with the catchment area and whose water was distributed to the fields as needed by channels;

1 *The Mahavansa*, trans. W. Geiger (London, 1912); *The Culavansa*, Parts I and II, trans. W. Geiger (London, 1929-30).

and the building of anicuts (diversion weirs) across rivers and streams, the water being carried by channels to a chain of storage tanks. In effect these were both storing rain water, since during the dry season all of the streams rising in the dry zone degenerate into a disconnected chain of pools or disappear entirely. There are however four rivers flowing through the dry zone which rise in the wet zone and thus are normally perennial: the Kala Oya, the Walawe Ganga, the Mahaveli Ganga, and its major tributary, the Amban Ganga. Anicuts were constructed on each, and water led, through a series of tanks, to the major dry zone agricultural areas, although the channels maintained the water table along their undulating courses by seepage as well. Water from the Kala oya, by way of the Yoda Ela ("Great Channel") and Kala Wewa ("Tank") was the main source for the ancient capital at Anuradhapura, supplemented by three large catchment tanks around the city itself. Anicuts on the Amban Ganga and Mahaweli Ganga fed the huge Parakrama Samudra ("Sea of Parakrama") Although these rivers rise in the wet zone, most of their courses lie outside it, and their volume fluctuates widely, both seasonally and yearly, especially the three smaller streams, which very occasionally run nearly dry. It was an interlocking system, water being fed from the anicuts or catchment areas to the large tanks, and from the large tanks in a desending hierachy to smaller tanks as far as the village, which were dependent on those above them to maintain their water level during the dry season, since their catchment areas were limited. It seems likely that the smaller village tanks were built or at least maintained by village labor, but the larger works seem clearly to have been the state's responsibility. A fragmentary pillar inscription of the early tenth century found near the southern edge of the dry zone mentions "the twelve great reservoirs", implying that they were maintained by a special corps of engineers or a special department.[1] It was a system well designed to make maximum use of the area's water resources, and to join the organizational resources of a bureaucratic state with the local labor of the villagers.

1 D. M. de Z Wickremasinghe, S. Paranavitana, et al., *Epigraphia Zeylanica*, IV (Colombo, 1952), 191.

The large tanks are on a monumental scale, and their bunds are not only engineering accomplishments but indications of a prosperous economy and well-organised state which had so great a surplus to invest. It has been estimated that the Padawiya tank contains about 17 million cubic yards of earthwork in its bund, and that it would have taken 10,000 men five years to construct, with the technical equipment of 1908 and for a cost of £ 1, 500,000.[1] Padawiya, Kala Wewa and Parakrama Samudra, the three largest of the ancient tanks, each have capacities of over 70,000 acre-feet, and each occupies more than 6000 acres; there are several others occupying over 4000 acres. Tanks were grafted onto flood water irrigation in parts of India, but in Ceylon the chain system of anicuts, channels, and the hierarchy of tanks was largely new. The irrigation problem in an alternately wet and dry area with a vanishing water table is more formidable than in a more even rainfall regime, such as China or Japan, where irrigation was equally extensive but where it could depend on perennial streams and on wells, and where it also had the advantage of relief. In nearly all of irrigated India too, wells have always been a mainstay, while in Mesopotamia and the Nile valley (as well as much of India and Southeast Asia) annual flood water in level river valleys regularly nourished the agricultural season. Ceylon's problems of intermittent streams, gross yearly variations, undulating relief, high evaporation some 8° from the equator, poor ground-water resources, indifferent soils and marked seasonal concentration of rainfall with its risk of disastrous floods (nearly all problems common to other ancient and abandoned sites in Southeast Asia mentioned above) were remarkably well met by this irrigation system.

There were three major centers of settlement up to the thirteenth century: the areas around Anuradhapura, around Polonnaruwa, and in the southeast of the island around what is now Hambantota (the ancient city of Magama was about twenty-five miles northeast of Hambantota). In the southeast, or Ruhuna to call it by its ancient name, the climate is particulary dry, but irrigation has the advantage of several small perennnial streams

1 W. L. Strange, *Report on Irrigation in Ceylon* (Colombo, 1909), p. 13.

rising in the hills of the wet zone to the west. Ruhuna, which included practically all of the lowland east and south of the Mahaveli, from Trincomalee and around the southern tip of the island, was apparently settled by Aryan-speaking people practicing well-developed irrigation nearly as early as Anuradhapura, but the record and the remaining ruins are less clear. Anuradhapura, was the capital and primate city until 1017, when following a destructive invasion by the Cholas from South India, the capital was moved to Polonnaruwa, which then became the primate area. The Polonnaruwa district had been developed much earlier, and King Mahasena (A. D. 274–302) built the famous Minneriya tank there, for which he was deified; it and several smaller tanks built between the fourth and ninth centuries must have supported a considerable local population. The whole of this northern part of the dry zone was known as Raja Rata (The King's Country"), and Anuradhapura was presumably selected as the capital because of its central position within the area first reached by the invaders from India, who probably landed in or near the Mannar peninsula as did most succeeding invasion waves. They followed the Malwatu Oya inland, as an easy route and as a source of water for their settlements. Anuradhapura was far enough from the sea to have some protection from raids, bnt near enough to guard this exposed frontier, and also well placed within the level agricultural area which could be irrigated.

The total population of ancient Ceylon, and specifically of ancient Anuradhapura, has been frequently exaggerated, through taking the *Mahavansa's* more fulsome passages too literally, through understandable national pride on the part of modern Ceylonese, or through the common and natural desire to tell an impressive story from the impressive ruins. Estimates have ranged from four million to seventy million for the country as a whole in the ancient period.[1] Chronicles give no census figures. Judging from modern

1 See E. B. Denham, *Ceylon at the Census of 1911* (Colombo, 1912); B. H. Farmer, *Pioneer Peasant Colonization in Ceylon: A Study in Asian Agrarian Problems* (London, Chatham House, 1956,) Ch, i; R. L. Brohier, *Ancient Irrigation Works in Ceylon* (Colombo 1635), I. 30; Strange, p. 20; H. W· Codrington, *Ceylon Notes and Queries* I (1913), 8, and IV (1914), 62 (Codrington believes the ancient population never exceeded four million and also discusses the small grain exports). For a contemporary account of ancient Anuradhapura by a famous Chinese Buddhist pilgrim, see *The Travels of Fa Hsien* trans. H. A. Giles (Cambridge, 1923), pp. 70 ff.

hydrograghic surveys and from what we know of the ancient economy, the most reasonable guess would be between two and four million, over 90 per cent of it in the dry zone, as what could have been supported from the available irrigated and unirrigated land. Until the eleventh century perhaps the majority of the ancient population was in the Anuradhapura district, as suggested by the remaining ruins and irrigation works, with important outliers toward Polonnaruwa. Northward the rainfall becomes increasingly inadequate and the irrigation possibilities more limited until the Jaffna peninsula with its ground water is reached. Until the thirteenth century all of this area was periodically under the control of Anuradhapura (or Polonnaruwa) and irrigation works were built throughout it, but it was never as densely settled as the heart of Raja Rata. Southward are the hills of the wet zone. In the southeast Ruhuna periodically asserted its independence or served as the refuge for defeated Sinhalese kings or rival claimants, but it was as frequently controlled from Anuradhapura and seems never to have rivaled it in numbers or in economic power. Anuradhapura's port was the ancient city of Mantota, near modern Mannar, through which it conducted overseas trade (largely in foreign hands), and in particular maintained its close relations with South India, although these were often in the undesirable form of invasions. It was in fact the repeated invasions, to which Anuradhapura was dangerously exposed, which must have dictated the shift of the capital to Polonnaruwa in 1017 following the Chola sack of Anuradhapura. The Cholas subsequently made Polonnaruwa their capital after they very shortly captured it as well, and until they were driven out of Ceylon by the Sinhalese in 1070. It had the virtue of greater protection against Indian raids and was also in a good position to guard against civil invasion from Ruhuna, especially since it lay near the main crossing place on the Mahaweli which any army from Ruhuna must force; the river itself afforded some protection to the city.[1] The Minneriya tank of earlier date, and other smaller tanks in the same area, were added to after 1070, and the city and its surrounding agricultural

1 For a discussion of the capital and its shifts, see S. Paranavitana, 'The Capital of Ceylon in the Ninth and Tenth Ceuturies', *Ceylon Journal of Science*, Section G (Archaeology), II (1935), 141–147.

base may have become nearly as large and as densely populated as the old Anuradhapura region.

The Chola conquest of 1017 was part of their expansion under Rajendra I from their base in South India as far as Malaya and Indonesia. Theirs was only the most successful of a long series of invasions, most of them of the nature of raiding parties, which plagued Raja Rata periodically from the time of Vijaya's legendary landing in the sixth century B. C. No succeeding century was free from them, and on repeated occasions they drove the Sinhalese power into the hiils for short periods. Often they were accompanied or followed by internal dissension when rival Sinhalese claimants to the throne made common cause with the raiders or took advantage of the king's weakness for their own ends. Nearly half of the time until the thirteenth century was occupied by invasions or raids, or by civil war. This disastrous process seems to have accelerated about the sixth century A. D. particularly in the increase in domestic quarrels, although the eighth and ninth centuries were relatively peaceful and productive[1]. The expulsion of the Cholas in I070 was however followed by extensive civil war, from which emerged in time the remarkable figure of King Parakrama Bahu I. He ruled at Polonnaruwa from 1153 to 1186, unified the whole of Ceylon under his control, invaded India and Burma, built an incredible number of irrigation works (including the Parakrama Samudra) and public monuments, and made of Polonnaruwa a city whose ruins are almost as impressive as Anuradhapura's. The period from which he emerged, the man and his policies and accomplishments and the rapid deterioration which followed him suggest comparison with Ch'in Shih-huang-ti (the first unifier of North China, who as model of forcefulness ruled from 246 to 210 B. C.). The death of Parakrama Bahu I saw a renewal of civil war, a brief decade of order, and then renewed dissension iucluding rival claimants from South India and invasions by Chola and Pandyan groups, ending in a devastating campaign of pillage under the Kalinga king Magha. After Magha's death in 1235, Polonnaruwa and the whole of Raja Rata and Ruhuna were abandoned. Pandyan

1 For a modern historical survey, see H. W. Codrington, *A Short History of Ceylon*, rev. ed. (London, 1939), esp. Chaps. i–iv.

invaders from South India reappeared from time to time in the ensuing century on raiding parties, and for one brief period Parakrama Bahu III (1302-10) ruled at Polonnaruwa as a vassal of Pandya. With this exception Raja Rata was left behind by the Sinhalese kings and people; their capitals retreated farther and farther into the hills of the wet zone, in search of security and also of the new kind of economic base to which circumstances compelled them to turn. Unable to maintain themselves in Raja Rata they turned to a poorer but more secure base and paid increasing attention to trade, especially in cinnamon, which was gathered wild in the wet zone forests under a royal monopoly and exported largely through Colombo. Colombo has always been a foreign city until the recent independence, and trade there remained in foreign hands - Arab, Moorish, Chinese, and finally Portuguese.

Occasional forays into the old country during the thirteenth centuries, even during the periods when Indian invaders were absent or defeated, apparently did not suggest the practicality of reoccupying it. Tamil settlers, who had been arriving off and on since before the Christian era, occupied the Jaffna peninsula and much of the area between it and Anuradhapura, known as the "Wanni";[1] they had been joined by Tamil members of invasion armies, often mercenaries, who chose to settle in Ceylon rather than return to India with the rest of the army (they often also joined forces temporarily with later invasion or raiding groups against the Sinhalese). With the thirteenth century the Ceylon Tamils too withdrew, and thereafter their settlements were almost entirely confined to the Jaffna peninsula and a thin strip down the east coast. In Ruhuna the record is less clear; inscriptions and ruins suggest that no major new irrigation works were built there after about the ninth century; Parakrama Bahu I conducted a major campaign in subduing Ruhuna, which suggests that by his time there was still a considerable settlement there. But by the thirteenth century it too was abandoned, and the whole of the ancient area left to jungle, wild animals, and the few miserable peasant villages which hung on around the ruins of ancient tanks. What happened?

1 As indicated by the large number of old Tamil place names in the Wanni.

"Nature is like a wild animal that you have trained to work for you. So long as you are vigilant and walk warily with thought and care, so long will it give you its aid; but look away for an instant, be heedless or forgetful, and it has you by the throat".[2] In the dry zone, weeds cover an untended field in a matter of weeks; in six months scrub growth has taken over; and in a few years great trees growing out of tank or channel bunds weaken them against the next heavy rains The rains are potent destroyers. The record is 31 inches in 24 hours, at a station north of Trincomalee, but nearly all dry zone stations experience 6 inches in 24 hours several times each year, and often the fall is heavier; an inch in five minutes is not uncommon. Floods resulting from rains like these, or from the cumulative rains of even a normal, let alone the recurrent excessive monsoon, bring certain havoc to any untended irrigation system. The amazing thing is that so many of the ancient works survived so long. But even after a brief period of neglect, such as the first three or four decades of the thirteenth century, the means of production in Raja Rata must clearly have been in a woeful state. By the nineteenth century when the British turned their attention to the possibility of reoccupying the dry zone, the cumulative results of neglect presented a formidable problem. But even then most of the main tanks still stood, and in the middle of the thirteenth century, destruction or jungle cover could not alone have repelled the Sinhalese when they had overcome these obstacles so many times before after earlier invasions and expulsions.

To attribute this dramatic withdrawal simply to the invasions, as local tradition largely does, ignores the repeated returns to the dry zone from the hills and the revival of the whole ancient system after each of the many invasions of the preceding centuries, some of which (notably the Chola conquest of 1017) seem to have been more destructive than those which followed Parakrama Bahu I. It is often assumed that the invaders cut the tanks and channels, and that the retreating Sinhalese may have done the same as part of a "scorched earth" strategy. This may have happened to some degree; cutting for example the Yoda Ela which fed Anuradhapura

1 Kamala Markandaya, *Nectar in a Sieve* (New York: John Day, 1954), p. 57.

would have been a serious blow, although like nearly all such actions its effects would be long delayed and probably would not be apparent before the next harvest season. There do not appear to have been any great sieges of the cities, and relatively little advantage would have been gained by the invaders from damaging the irrigation works. In fact, there are exceedingly few breaches which can safely be attributed to wilful destruction; almost all look like the result of floods after a period of neglect, especially since they occur at the weakest places or points of greatest pressure. If earlier invasions cut the bunds, or earlier periods of neglect breached them (as seems more likely), the breaches were quickly repaired with each reoccupation by the Sinhalese. It does not seem reasonable that this highly productive area with its strong traditional importance in the Sinhalese mind should have been abandoned simply because of fear of invasion, especially not in preference for the wet zone. The same explanation is commonly offered for the abandonment of the ancient sites in Cambodia, Siam and Burma, and it seems similarly oversimplified. Chronic invasion has not produced this result in Belgium, or the North German plain, or Korea, or the Ganges valley; productive areas may attract invasion but they are not abandoned for fear of it even after repeated bitter experiences. Except for a short period of looting, the final invaders made no use of Raja Rata; they and their Tamil cousins or allies in the Wanni left it and returned to India or Jaffna. The ensuing vacuum the Sinhalese were apparently unable to fill. Clearly something must have happened to make irrigated agriculture there unworkable on the former scale. Much of the historical literature recognizes that invasion alone is not an adequate explanation,[1] but there have also been frequent attempts to build some sort of *deus ex machina*, and surprisingly few attempts at an overall analysis, which is the justification for this article.

One of the most tempting solutions to historical problems like this is climatic change,[2] tempting because it is so simple, but not

1 For notable examples, see J. E. Tennent, *Ceylon*, 2 vols. (London, 1859), passim; H. W. Codrington, *A Short History of Ceylon*.

2 For a discussion of this general problem, see my 'The Decline of North Africa since the Roman Occupation: Climatic or Human?', *Annals of the Assoc. of Amer. Geographers*, XLI (June 1951), 116-132.

often applicable in the absence of direct or convincing evidence. Several students have however suggested that a decrease in rainfall may have been responsible[1]. Dry-zone droughts are indeed terrible and impressive experiences, but they occur yearly, and especially severe ones clearly occurred at longer intervals of 10, 30 or 100 years throughout the ancient period; the *Mahavansa* mentions them repeatedly. There is no evidence of any sort to suggest that they increased in intensity or frequency after the twelfth century. As elsewhere, abandonment of the dry zone has been used as evidence of climatic change, hardly a logical argument; abandonment cannot be attributed to a factor for which it provides itself the only evidence. Nothing about the ancient irrgation works, fords, or bridges suggests that the volume of water, carried by dry-zone rivers before the thirteenth century was greater than now, and in fact one of the strongest pieces of evidence against climatic change is that the modern and ancient irrigation works are so similar, and can irrigate from the same catchment areas the same amount of cultivated land. Had there been a change in climate, it would almost certainly have included some change in the line between the dry and wet zones or in their general areal occurrence. Yet ancient irrigation works are all over the modern dry zone, and absent from the wet zone; the present wet-dry zone line coincides almost exactly with the line between the ancient irrigated and unirrigated areas. Finally, progressive climatic change in the period under review is intrinsically unlikely on meteorological grounds in this part of monsoon Asia. We must look for other causes.

One which has received a good deal of attention[2] and which would naturally suggest itself to a geographer is soil exhaustion. This might have resulted from growing the same crop (rice) in the same fields, apparently without any but casual manuring, for

1 R. L. Brohier, *Ancient Irrigation*, I, 3; idem, *The Tamankaduwa District and the Elahera-Minneriya Canal* (Colombo, 1941), p. 2; E. K. Cook, 'A Note on Irrigation in Ceylon', *Geography* XXXV (1950), 75-85; and others.

2 See among others, *Report of the United Kingdom and Australian Mission on Rice Production in Ceylon*, 1954, Sessional Paper 2 (Colombo, 1955), p 33; R. H. Spencer-Shrader, 'The Secret of the Tanks' *Loris* (Colombo) III, No.6 (1945), 215-218, and IV, No. 1 (1945), 291-292; H. Thirlaway, "Ruhuna and Soil Conservation" *Loris*, III, No. 6 (1945), 210-214. Strange, *Report* (see n: 7).

centuries on end in many of the ancient areas, and also from erosion. The rainfall regime of the dry zone means sheet and splash erosion even on level ground. Erosion of unirrigable lands, however slight the slope, is increased by the prevailing shifting cultivation (*chena*), although the absence of severe population pressure has made it unnecessary to use shifting cultivation on steep slopes even into the modern period Insertile silt washed down onto cultivated fields might further have reduced their productivity. The soils of the dry zone (outside the fertile limestone areas of the Jaffna peninsula) are mainly tropical red, reddish brown, and dark grey loams with small patches of limestone or alluvial soils and a narrow coastal belt of sand. Paddy soil tends to acquire their own special properties after long use, but in the dry zone these are not particularly productive. In general, dry-zone soils are thin, shallow with a coarse sand or gravel B horizon at about one foot, and exhibit the other more usual characteristics of wet-dry tropical soils including their indifferent fertility. Under dry-field conditions, they rapidly lose fertility, and after two or three years it may no longer pay to work them, hence the widespread practice of *chena*, which in dry Ceylon as elsewhere in the tropics is still the only practicable use for much of the unirrigable land.[1]

Remembering the very heavy and traditional fertilization of paddy soils in Northeast Asia, the drop in yields when fertilization is neglected, the universal practice of transplanting (still largely absent in modern Ceylon as it probably was in the ancient period), and the greater natural fertility of most Chinese and Japanese soils as compared with those in Ceylon, it might seem a foregone conclusion that Raja Rata was abandoned because fifteen centuries of unfertilized mono-cultivation had exhausted the naturally poor soil. One can also argue that nowhere else in the world, with the qualified exception of parts of South India, has the sedentary

1 On soils, see the articles by A. W. R. Joachim, S. Kandiah, et. al.; 'Studies on Ceylon Soils", *Tropical Agriculturist*, a series of articles in Vols. LXXXIV (1935) through XCVIII (1942), and their several references; "Review of Progress in the Study of the Soils of Ceylon", *Proceedings First Annual Sessions*, Ceylon Association of Science, 1945; 'The Effect of Shifting Cultivation and Subsequent Regeneration of Vegetation on Soil Composition and Structure", *Tropical Agriculturist* CIV (1948), 3-11.

monoculture of rice (or any other crop) persisted anything like this long except on volcanic, limestone, regur, or alluvial soils, quite apart from the matter of fertilizaiton. The shift of the capital and economic center from Anuradhapura to Polonnaruwa may suggest the attraction of relatively virgin soils in the latter area, as may the withdrawal of the Tamils from the Wanni to the productive Jaffna limestones. But rice grown under irrigation is a unique crop Soil fertility does affect its yield, as does fertilization, but it does not appear to exhaust the soil even over long periods without fertilization, and in many cases it may actually improve the soil. On virgin soils a rapid decline in yield usually takes place, in the absence of fertilization, within the first two or three years, but after ten or twenty years the field tends to remain stable more or less indefinitely. This has been borne out by experiments in various parts of tropical Asia, by increased knowledge of the processes involved, and by accumulated experience.[1] On fertile soils with inadequate fertilization the yield stabilizes at a very low level, as is the case now in Ceylon and most of South Asia, but it does stabilize. Why this should be so is not yet entirely understood, since rice like any other crop does take nutrients from the soil. Apparently they are replaced, or in some cases more than replaced, by nutrients which enter with the irrigation water, by the presence and decay of vegetable and animal matter and bacteria in the irrigated paddy (including fish and smaller water life) and by the blue-green algae which grow in paddies especially under tropical conditions and which are potent fixers of nitrogen. The water cover minimizes oxidation and protects the soil from the damaging effects of sun, rain, and wind. It is also important to remember that in dry Ceylon (as in much of South Asia) rice occupies only the lower pockets of land, which receive, whole or in solution, much humus and organic material from the surrounding higher areas around the bowl. Cattle are grazed on the paddies when they are dry between crops, and leave their droppings there as well as on the surrounding higher lands from which the rains wash them down to the paddies again.

1 See inter alia D. H. Grist, *Rice* 2nd. ed. (London, 1955), Ch. xvi and passim; Pierre Gourou, *The Tropical World*, trans., Laborde (London, 1953) p. 100 and passim.

The bottom of the soil catena is always a favored place, and the paddies clearly profit from considerable alluviation perhaps in part thanks to the widespread *chena* cultivation of the surrounding areas with their periodic burning off of jungle; much of the ash and other litter finds its way eventually to the paddies. Relatively little of the total dry zone area was used for rice; most could not be irrigated, and in effect these areas nourished the pockets of paddy with their own organic fertilizer in a way quite different from the more normal Chinese, Japanese, Indo-Chinese, or Gangetic situation of dense and unbroken rice culture over wide deltaic areas. Without fertilization in the ancient period aside from casual contributions by grazing cattle, yields must have been low, but it seems almost certain that they remained fairly stable, and that the bottom did not suddenly drop out in the thirteenth century, when fifty years before, Parakrama Bahu I's accomplishments indicate that he had ruled a highly productive country.

Two other possibilities suggest themselves about the soil: alkalinity and salinity. Both may result in a dry climate from excessive evaporation and inadequate drainage, leaving the stranded salts or alkalines to whiten and to poison the ground. This had happened not only under natural conditions but on a very large scale as a direct result of irrigation in India, Pakistan, Africa, the United States and elsewhere. Apparently it has never happened in Ceylon except for small local patches, despite the shallowness of the soil and the nearness of the bedrock to the surface. Where irrigation water brought salts or alkalines, the soils were kept flushed by the heavy seasonal rains and by the slight but adequate slope. There is no evidence that alkalinity or salinity were more widespread in the ancient period than now, and this is intrinsically unlikely given the well understood physical causes of these problems. We are obliged to interpret broadly two suggestive passages in one of the lesser chronicles, the *Rajavaliya*, which account for a period of decline in the fifth and sixth centuries: "because the fertility of the land was decreased, the kings who followed were no longer of such consequence as those who went before", and "because the produce of agriculture and horticulture was failing".[1]

1 *The Rajavaliya*, trans. B. Gunasekera (Colombo, 1900), pp. 52-53.

"Fertility" must be used here in its somewhat archaic general sense of productivity, which is far more than a function of the soil; something else must have been at work.

Was it siltation of the tanks and channels? This is another very common problem which has ruined countless irrigation systems, and which still plagues most of those now in operation all over the world, in differing degrees. Its historical devastations in irrigated North China, Central Asia, India, the Middle East, and the Mediterranean basin are well known. A high silt content is typical of dry-climate rivers. The violent seasonal rainfall of Raja Rata, and the widespread *chena* cultivation of the interfluves, have suggested to several students that siltation may have been serious enough to have forced the abandonment of the ancient areas[1]. But little siltation has occurred, even during the long centuries of neglect. At most the tanks have silted to about a quarter of their capacities, but with the great majority much less. Take-off pipes in the bund of Parakrama Samudra to supply the royal baths are now above mean water level in the restored tank; the modern engineers who repaired the breaches have not raised the water to its ancient level for fear of breaching the bund; this clearly shows the negligible amount of silting in the tank. (It also suggests another important point, which will be dealt with later). Most of the ancient channels in the dry zone follow the contours along the slight slopes, and are frequently one-sided, with a bund only on the down-slope side; one would expect disastrous silting as well as flood damage, but very little has occurred. Where the channels cross stream valleys and often take the form of small one-sided tanks both dangers would appear to be maximized, and yet even here they have not materialized substantially. Shifting cultivation on the interfluves should have produced more siltation; erosion and heavy runoff should have increased floods as well as making even a constant amount of rainfall less effective. Apparently this did not happen to any great extent. *Chena* is carried out in small patches at a time, surrounded on all sides by heavy jungle which effectively blocks most of the material eroded from the temporary

1 Spencer-Shrader and Thirlaway (see n. 16) argue forcibly that this is the answer.

clearing and releases it to lower lands more slowly and in finer solution. Weeds cover any cleared area almost immediately, and full jungle cover follows so quickly that massive erosion is never able to establish itself in a climate warm enough the year round for natural vagetation to flourish at impressive rates. Population pressure was never severe enough to force *chenas* onto really steep slopes (as in Korea or Japan), and clean cultivation was practiced only on the level irrigated lands, most of which were protected against erosion by the water and diking in the paddies. Wherever the soil is bare, it is packed so hard after a few minutes by the violent rains, given its lateritic nature and low silt content, that runoff is very quick and erosion surprisingly slight.[1] Finally, the anicut system was much less likely than a dam to accumulate silt in tanks or channels; much of the silt (and water) in the streams passed over or around the anicuts. The cumulative result of these factors is that modern engineers have to do little regrading or cleaning out of ancient irrigation works, and that as far as one can tell no tank was ever abandoned because of siltation.

After these successive pursuits of blind alleys, and remembering the physical conditions on which dry-zone irrigation must be based, it is clear that only a high level of organization and massive labor could build the works and provide the constant maintenance which was essential. The works themselves, and the monumental scale of the ancient capitals, re-emphasize the nature of the state and society which created them. Apart from the irrigation works there are the huge stone buildings, baths, and stupas; the largest of many stupas at Anuradhapura is bigger than any of the Egyptian pyramids except the third at Gizeh, and it is surrounded for miles by others nearly as big and by a host of other stone buildings and baths. The same is true on a slightly smaller scale at Polonnarnwa, and elsewhere. Villagers living near the ruined Giant's Tank (near Mannar) told the Dutch Governor van Imhoff in 1739 that it would take 500 men five months merely to repair the main breach, while a thousand men would

1 E. F. L. Abeyaratne's experiments in this connection at the Government Dry Farming Research Station at Maha Illuppallama (near Anuradhapura) are illuminating - see *Pioneer Peasant Colonization* (see n. 8), Ch. iv

need two years to restore the whole tank.[1] Understandably, the job was not undertaken by the Dutch because the labor could not be found. The old society of Raja Rata must have been able at will to marshal and organize enormous amounts of labor. The *Mahavansa* and surviving inscriptions outline a clear picture of a Wittfogelian oriental despotism.[2] Although the *Mahavansa* and the inscriptions are not frank critiques by nature, they contain unmistakable hints of the divine and absolute qualities of the kings (such as their intercession with heaven for rain and their attributing drought to their own personal lack of virtue), an overgrown and rapacious bureaucracy, a web of taxes. a battery of dues owed by peasants to the state (including corvee labor), collective responsibility at all levels and in all matters, and the general furniture of a semi-feudal system such as is convincingly associated by Wittfogel with irrigation. The complexity of the irrigation works suggests that it was a well organized, centrally administered system, and the surviving inscriptions give some picture of it such as the reference to the twelve major reservoirs (see above), and the enumeration officials responsible for particular branches of irrigation; one inscription even records the punishment given to irrigation officials who failed to carry out the royal regulations.[3]

Especially in the dry zone was all of this necessary, for the labor needs merely for maintenance must have been tremendous, given the nature of the climate. Dams or anicuts, and tanks are not easy to build in the dry zone because the relief is slight and there are few convenient dam or tank sites in narrow valleys or basins where hills can do some of the work and can also provide an anchor. Bunds were thus mainly long low walls across broad, shallow valleys, representing much material. This also increased the danger from floods, especially the flash floods characteristice of the dry zone, and underlined the need for constant maintenance. The possession of land in the ancivent period involved fixed

1 Brohier, *Ancient Irrigation Works*, II, 37.

2 K. A. Wittfogel, "Die Theorie der orientalischen Gesellshaft", *Zeitschrift fur Sozialforschung*, VII (1938), 90–123; idem, "Oriental Society and Oriental Despotism" (forthcoming).

3 S. Paranavitana "Glimpses of the Political and Social Conditions of Medieval Ceylon", in *Sir Paul Pieris Felicitation Volume* (Colombo, 1956) pp. 69-74

obligations of service to the state. Taxes were computed only partly in grain; perhaps a majority of the land dues were in the form of labor, which was called *rajakariya* (the king's labor). The kings and the state seem to have paid little attention to trade, which was left largely in foreign hands; Anuradhapura contained a special quarter for foreign merchants and religionists, according to the *Mahavansa*, but no mention is made of local merchants, and the general impression is clear that grain revenues and *rajakariya* were the main supports of the state.[1] This system fitted well with the yearly cycle of agriculture for approximately six months of the year was a period of underemployment in the fields; it was also the time when streams dried up and tank levels fell so that major construction or repair could be undertaken with the *rajakariya* available. A revealing passage in the *Mahavansa* makes clear the forced and unpaid nature of this work, even though it was in effect considered as part of the tax. The account of the building of the great stupa at Anuradhapura by King Dutugamunu (161–137 B. C.) stresses the king's insistence that "no work shall be done here without wage."[2] Apparently this was a most unusual proceeding; the king wanted to make sure that he alone acquired the merit from building the stupa, and whenever his spies informed him that some zealous monk, equally desirous of merit, had put a brick on the pile, he made sure the monk was followed and made to accept a wage or gift. But one cannot read the *Mahavansa* or visit the ancient sites without thinking of the man-hours forced by the state to build and maintain this monumental civilization.

It is in keeping with the history of all similar civilizations of a despotic character and dependent on forced labor for the maintenance of large irrigation works on which their prosperity depended that the institutional machinery in time weakens and breaks down from obvious internal causes, let alone the invasions

1 See E. Reimers, "Feudalism in Ceylon", *JCRAS*, XXXI (1928), 17–54; W. A de Silva, "A Contribution to the Study of Economic and Social Organization in Ceylon in Early Times", ibid., pp. 32–76; H. W. Codrington, *Ancient Land Tenure and Revenue in Ceylon* (Colombo, 1938), R. L. Brohier, "Land Tenure and Land Laws", *Bull. Ceylon Geog. Society*, V, No. 2, (1950), 123–135.

2 *Mahavansa*, (see n. 5), p. 199.

which plagued Raja Rata. While these latter may occasionally have served to rally national feeling and infuse new vigor, their cumulative effect must have been destructive, especially as they were accompanied or followed by renewed outbreaks of the internal dissension which has harried and drained Ceylon through most of its history, These forces must progressively have eaten away at the basic fabric of a state and society already losing its vigor with age One could not expect evidence of this in the chronicles or inscriptions, given their nature and purpose. However, a fragmentary inscription on a slab of rock at the main anicut on the Mahaweli describing the Kalinga invasion of. A, D. 1210 reads in part as follows:

"The great host of Tamils descended on this Lanka, destroyed the Minister named Ati, and unhampered in all mountain fastnesses and forest fastnesses, swept over the whole of Lanka in the manner of the world-consuming flames at the end of an aeon, having destroyed the entire social structure and the religious organization."[1]

The shattering effect of invasions on the social and governmental structure is apparent even without this testimony. The first result of such pressures would have been a disastrous weakening of the state's command over labor. The collapse of *rajakariya* (through collapse of the whole system rather than depopulation, which might otherwise soon have been made up) is a sufficient and convincing cause for the abandonment of Raja Rata. Even without what evidence exists, one could almost assume that it would have taken place after seventeen centuries of tight control punctuated by invasions and civil wars. The several famines which followed invasions and rebellions in the 1700 years before the thirteenth century were clear signs of what happened to the basis of the economy as soon as the central authority was weakened. They also suggest that like all despotic systems dependent on absolute control of the human resources in order to wrest a living from uncompromising physical resources, the old order contained the

1 S. Paranavitana, *Epigraphia Zeylanica*, V, (1955), 160; "Lanka" means island, and is a traditional name for Ceylon.

seeds of its own collapse. It was not the invasions themselves which forced the abandonment, but the total disintegration of the old order, a disintegration to which the invasions undoubtedly contributed which they did not wholly produce. Ceylon, unlike China, had no great reservoirs of population, land, space, and new vigor on which China could draw after each dynastic collapse. In Central Asia the setting was more on a Ceylonese scale, and the irrigation societies there repeatedly fell and disappeared, leaving behind them water works which they were no longer able to maintain after invasion and internal decay had weakened them.[1]

Parakrama Bahu I in his brilliant revival of the ancient grandeur which in retrospect looks like the last bright flare of a dying flame may have contributed to the suddenness and completeness of the collapse which so shortly followed him. He is compared above with Ch' in Chih-huang-ti, but his reign may have been even more exhausting to the resources and structure of his kingdom and even more bitterly resented. Besides building the Parakrama Samudra and the city of Polonnaruwa *de novo*, he restored Anuradhapura from ruins, built stupas and temples all over the dry zone, and fought long and exhausting military campaigns in South India and Burma as well as in his own country. He is credited by the *Culavansa* with building or restoring 165 anicuts, 3910 channels and 2539 tanks. It is notable that in the thirty-three years of his reign, there were several uprisings, including three especially long and bitter ones.[2] The *Culavansa* records how his successor freed many whom Parakrama Bahu I had "thrown into prison and tortured", and restored "to various people their village or their field"[3]. An inscription discovered at Anuradhapura recording the merits of his weak successor also speaks of Parakrama Bahu I's "excessive and illegal punishments in violation of the customs of former sovereigns".[4] Clearly a forceful man, and perhaps by forcing the pace to such an extent, a hastener of the ensuing deugle.

1 See Owen Lattimore, *The Inner Asian Forntiers of China* (New York, 1940); Aurel Stein, *Innermost Asio*, 3 volsa. (Oxford, 1928).

2 C, W. Nicholas "The Irrigation Works of King Parakrama Bahu I", *The Ceylon Historical Journal*, IV (April 1955), 52-68.

3 *Culavansa*, (see n. 5) II, 125.

4 *Epig. Zelan.* II, 81.

The weakened governmental authority and fissiparous society which followed him were further sapped by the Pandya and Kalinga invasions. Without *rajakariya* in large and constant amounts no attempt to reoccupy the dry zone could be considered. Parakrama Bahu I had to restore several of the irrigation works he had himself built in the early part of his reign, a testimony to the destructive power of dry-zone floods and to the need for massive labor if the system was to be kept functioning. Even in the nineteenth century the final legal abolition of *rajakariya* by the British in 1832 was blamed for a rapid ensuing deterioration of the economy, especially in the irrigated areas: "It took from the people the power of combination".[1] During the modern restoration of the ancient tanks, excavations have revealed in the bunds of nearly all of them ancient breaches which had been repaired, often in as many as four or five places. This must have been part of the normal risks which the ancient engineers took, knowing they could count on *rajakariya* to repair the breaches without having to worry greatly about the cost. There is much to suggest that they did in fact build to make use of the peak flood waters, accepting the risk of breacheng which this involved. Nearly all of the ancient spillways are inadequate by modern standards; the lesson of the take-off pipes for the royal baths at the Parakrama Samudra will also be remembered in this connection. The frequently quoted words of Parakrama Bahu I are suggestive:

"It is my chief duty to gather up an abundance of grain by all that lieth in my power . . . In the kingdom that belongeth to me there are many paddy lands that are watered chiefly by water from rain clouds, but the fields that depend on a perpetual supply of water from the rivers and tanks are verily few in number . . . In a country like this not even the least quantity of water that is obtained by rain should be allowed to flow into the ocean without profiting man . . ."[2]

The king of course may have failed in the duty which he set himself, but he seems to have been speaking of an irrigation

1 Strange, (see n. 7) p. 16.
2 *The Culavansa*, trans. Wijesinha (Colombo, 1889) Part 2, p. 147.

system which was playing for high stakes and which would have been correspondingly dependent on the labor force which only a tightly functioning state and society could command. The chain system of anicuts, channels, and the hierarchy of tanks meant that any one breach might have widespread ramifications and that no part of the system could be neglected. Persistent elephant and cattle tracks along or across bunds, and the growth of trees, opened the way for the destructive power of the floods. Disruption of the irrigation system was of course disastrous to dry-zone agriculture, while in a different sort of climate or in an area of perennial rivers agriculture might have limped along without its customary irrigation. Realizing, perhaps after some abortive attempts, that they could no longer command the essential labor and organization, the Sinhalese rulers after 1235 (and the Indian and Ceylon Tamils too) abandoned the now unworkable gold mine of Raja Rata, while the few remaining peasants eked out a dwindling existence beside the ruined tanks.

Why did the collapse of the old order come at this particular time? Why not after the Chola invasion of the eleventh century, or at any one of the many periods of rebellion, or at what appears to have been the start of a downhill slope in the sixth century, or later than the thirteenth? These questions cannot of course be answered with any confidence that by the thirteenth century cumulative disintegration, from the various causes suggested, first reached a critical point of no return . While it seems likely that this was in fact the case, and that the collapse of the old order and weakening or disappearance of its command of *rajakariya* adequately explains the abandonment, there is another factor which may have made the thirteenth century different from any of the earlier periods of crisis, namely malaria. This grosssly debilitating disease seems certainly not to have been endemic, and probably not even epidemic, in ancient Ceylon. None of the historical texts mention it recognizably (though they do mention other epidemics which clearly were not malaria), but the monuments of the ancient civilization are in themselves sufficient proof that malaria did not dominate the dry zone then as it did until the development and use of DDT after 1945; more likely it was totally absent. No one who has seen an area of severe endemic malaria or the people

who inhabit it needs convincing that if the disease had been virulently present in Ceylon before the thirteenth century the old civilization of Raja Rata could never have existed. Until about the end of World War II the dry zone was one of the world's worst malarial areas. The few peasants who lived there did so on a low level, depressed as only living levels in the tropics can be, their vigor and initiative drained by malaria, and supporting themselves on the tiniest of margins with the minimum of work; this did not include the repair of even minor breaches in the ancient tanks besides which nearly all their miserable villages clustered. The first recognizable references to malaria are in the early Portuguese accounts of the island in the sixteenth century, but they suggest that the disease had already been established on an endemic basis for some time, since they describe large areas virtually depopulated by fever, and mention it as a recurrent scourge elsewhere.[1] Robert Knox, who was a captive in the Kandyan kingdom from 1660 to 1679 mentions it prominently in his careful account as a long-established problem especially of the dry zone.[2] The first genuine census under the British, in 1871, showed a population density of four per square mile in the Polonnaruwa district of 1200 square miles. Malaria has always been most virulent in the dry zone, where anopheles breeds in the shrunken and stagnant streams or strings of pools during the long dry seasons; in the wet zone, streams are normally kept flushed throughout the year, and malaria was epidemic only during the infrequent droughts. This was in itself enough reason for those in the wet zone to avoid the dry zone at all cost, and it was perhaps the greatest single reason for the failure of the dry-zone colonization schemes in the thirty or forty years before 1945.

It seems almost out of the question that malaria could have caused the original abandoment of Raja Rata. Clearly no virulent form was present in the reign of Parakrama Bahu I, and it is most unlikely to have been present before the abandonment in 1235 or during the Kalinga campaigns, judging only from the scale of occupation and activitiy. There are no references to disease in

1 C. L. Dunn, *Malaria in Ceylon* (London, 1936).
2 Robert Knox, *An Historical Relation of Ceylon* (London, 1681).

this period, and had there been any epidemic or the Sinhalese forces sapped by it, it would probably have been mentioned in the chronicles. It also seems unlikely that malaria could have established itself so quickly as to have wrecked a civilization in twenty years. We can only conjecture about the date of its entry into Ceylon, or of its establishment on a virulent level. As so often elsewhere, anopheles must have found ideal breeding places in abandoned tanks and channels; malaria has followed the destruction or desertion of irrigation works so many times that one looks for it automatically. There is only circumstantial evidence to suggest that it entered Ceylon before the sixteenth century, but it is compelling. Malaria was present in the Mediterranean basin by the fifth century B. C., and appears also to have been endemic in Han China.[1] It probably played some part in the final collapse of the Roman empire, and it seems inevitable that it should ultimately have reached Ceylon, via India; one would expect it to have done so by the thirteenth or fourteenth centuries. The constant coming and going of Indian armies may have accelerated its passage, or it may have come in with the last invasion wave of the Kalingas; in the dry zone it would have found ideal conditions, more favourable to its growth than the South Indian home of the invaders. Certainly within a century it could have added a further insuperable obstacle to the reoccupation of Raja Rata, one which even in the modern period defeated all attempts at large-scale settlement until the advent of DDT. This may help to explain why the abandonment was so final and abrupt, and why it came when it did. The last Kalinga invasion not only gave the final shove to an already tottering social and governmental regime which had lost its power over the organized labor essential for life in the dry zone, but may also have left the seeds of another equally negative factor. A note on an early Portuguese map of Ceylon dated ca. 1606 may help in estimating the timetable; it indicates Ruhuna as depopulated by "sickness" three hundred years earlier.[2] If this was malaria, which is far from certain, and if the date suggested is right, it must have come as

1 W. H. S. Jones, *Malaria in Greek History* (Manchester, 1909); H. H. Scott, *A History of Tropical Medicine* (London, 1939) I, 155, 179.

2 E. Reimers, *Constantine de Sa's Maps and Plans of Ceylon* (Colombo, 1929,) p. v.

early or earlier to the Anuradhapura and Polonnaruwa districts, or about the second half of the thirteenth century.

Too little is known of the history of malaria's spread to be definite about this, however presumptive the other circumstances may be It is known that sometime after the thirteenth century malaria also became virulent in Burma, Siam, and Cambodia. The fall of the Pagan and Haripunjaya Kingdoms later in the thirteenth century. and of Angkor Vat not until 1450, may parallel the gradual eastward spread of the disease entering the Indo-Chinese peninsula shortly after it entered Ceylon. In these areas too, malaria repelled further settlement or reoccupation, following destructive invasions which must have affected the already deteriorating social and governmental fabric in much the same way as in Ceylon. The blows of invaders added to cumulative internal decay may have led to neglect and abandonment of irrigation systems for the lack of organised labor which the state could no longer muster. The Ceylon experience suggests that this was the controlling cause, but also that malaria, coming in on the heels of invasion and thriving on disused irrigation works, played a critical part in multiplying the obstacles to reoccupation. With malaria now conquered in its own dry zone, Ceylon has been the first of them to carry out a major program of resettlement. Its success depends to a large extent on whether, under modern economic conditions, and at a bearable overall cost, the tractor and the bulldozer can replace *rajakariya*.

4

THE WITHDRAWAL OF THE SINHALESE FROM THE ANCIENT CAPITALS*

S. PARANAVITANA

The most important factor which profoundly affected the economic as well as the political and social conditions of the period dealt with in this book (*from the thirteenth to the end of the fifteenth century*) was the gradual decline and depopulation of the northern and south-eastern regions of the Island, in which agriculture depended on irrigation, and the shifting of the centres of population to those areas where rice fields are mostly rain-fed. It was in the northern and south-eastern parts of the Island that the Sinhalese settled in early times, and subsequently built their cities and religious monuments. As has been detailed in the earlier chapters, the productivity of these areas was increased by an elaborate system of irrigation which attained its highest development in the seventh century, and was restored to its maximum potentiality by Parākramabāhu I in the second half of the twelfth century.[1] It was these regions that witnessed the efflorescence of the Sinhalese

* Reprinted from S. Paranavitana, 'Civilization of the period: Economic, Political and Social Conditions', *University of Ceylon History of Ceylon*, Ed.-in-Chief H. C. Ray (Colombo, 1960), Vol. I, Pt. 2, Bk. V, Ch. VII, pp. 713–720.

1 See *UCHC*, pp. 519 ff; 352; 553 ff.

culture, that contained the most venerated shrines of their religion and is, even today, remembered with a great deal of pride and sentimental regard by the Sinhalese who for many generations had been living in other regions. The abandonment of these once prosperous areas by the leaders of the Sinhalese people at the beginning of our period was therefore not done voluntarily.

The withdrawal of the Sinhalese from the ancient capitals of Anurādhapura and Polonnaru, and the decline and the ultimate collapse of the structure of civilization created by their ancestors, are generally held to have been caused by the invasions and wars during the first decades of the thirteenth century. There had, however, been invasions in earlier times, at least one of them of a much more disastrous nature than the inroads which preceded the end of the Polonnaru kingdom; but the country recouped after the fury of these onslaughts had been spent. Moreover, if the Sinhalese retired southwards before the advancing enemy, the fair lands vacated by them should have been occupied by the conquerors. In fact, in places like Padavi, Vāhalkaḍa, Saṅgilikaṇadarā, etc., there are archaeological remains indicating settlements of Tamils during the eleventh century and later[1]; numerous Tamil place names which have displaced the earlier Sinhalese names are met with in the present Anurādhapura and Kuruṇāgala Districts. But most of these villages with Tamil names are at present inhabited by Sinhalese, who had migrated about three hundred years ago from the Vanni Hatpattu, the Tamils who occupied them in the thirteenth century or so having abandoned them. The Tamils who settled down in Ceylon as a result of the invasions during the eleventh to thirteenth centuries ultimately concentrated themselves in the Jaffna Peninsula, and in a narrow coastal belt on the north-west and east of the Island. The areas of the Island which were considered the most desirable during the millenium and a half from the beginning of its history had thus been abandoned by the people who had occupied them for that long stretch of time, and also by the newcomers who had gained control over them.

The real cause of the desolation which overtook the northern and south-eastern plains of the Island in the thirteenth and

1 *ASC, Seventh Progress Report*, pp. 23 and 43; *SII*, IV., Nos. 1408 and 1409.

fourteenth centuries, has therefore, been sought by some in factors beyond the control of man in those days. It has been suggested that the effects of a climatic change, which was developing steadily, were acutely felt at this epoch, making these regions unproductive and incapable of supporting the large population of earlier times. But the study of the catchment areas of the major tanks, and of the rainfall figures in modern times, affords no support to the view that in ancient times these districts enjoyed a rainfall appreciably greater than what it is now. Another view is that the exhaustion of the soil after over a millenium of continuous unicrop cultivation forced the tillers to go in search of lands which were productive. Those who have studied this aspect of the matter scientifically have not found evidence supporting that view either.

Famines, followed by pestilence caused by the failure of crops due to prolonged droughts and disastrous floods, and the damage to irrigation works caused by the latter are surmised by others to have been the cause of the ruin of the Rajarata. The available historical records, by their very nature, do not contain many references to such calamities. A serious drought which threatened the failure of crops is said to have occurred in the reign of Parākramabāhu II.[1] There is also what appears to be the mention of a famine in a fragmentary passage of the *Cūḷavaṃsa* referring to the years following the end of Bhuvanaikabāhu I's reign.[2] Famines and pestilences, however, were not unknown in earlier times, and some very severe visitations of this nature are recorded during the first century B. C. and the first century A. C.[3] These no doubt took a considerable toll of the population, but the loss was made good in the normal years which followed.

Malaria has been given as the main cause for the downfall of the ancient civilization of the Island. Up to the twelfth century, this scourge was probably not prevalent in an endemic form, for a population debilitated by malaria could not have

1 *Cv.*, lxxxvii, vv. 1 ff.

2 *Cv.*, xc, v. 43; See *UCHC*, p. 631.

3 See *UCHC*, pp. 166-167; p. 185.

produced the surplus wealth necessary for the erection of the great religious monuments and other public works which these centuries have bequeathed to posterity. Malaria, it is true, has been very effective in preventing the re-occupation of these regions during a period of about seven centuries after their virtual abandonment in the Dambadeṇi period. But whether malaria was the cause, or the consequence, of that abandonment is a debatable point.

The latest opinion on this question, expressed after an examination of all the available data in the chronicles and in the inscriptions, and a comparison of similar phenomena in other Asian countries, is that the decay of the ancient Sinhalese civilization was caused primarily by the collapse, as a consequence of the foreign invasions and internal discord, of the elaborate social and administrative organization that was necessary for the construction and maintenance of the complicated irrigation system that made these regions productive and prosperous.[1] This implies that similar disasters which occurred prior to the thirteenth century caused no real dislocation of that administrative machinery and social, organisation, and that the invasion of Māgha, which preceded the moving of the seat of government from the Rajaraṭa, was associated with certain conditions which brought about such dislocation. In this connection, it is necessary to remember that the maintenance of the major irrigation schemes, though it was the responsibility of a department of the central government[2], depended on the loyal co-operation and efficiency of the local chiefs whose function it was to supply the labour necessary for the purpose. These local chiefs who not only supported the central government in this matter but also maintained the authority of the king in their respective spheres, were known in the days of Parākramabāhu I as the *kulīnas*[3]. And it is precisely this class of feudal nobility that suffered the most during the regime of Māgha. They are said to have been forced to work as labourers in the fields, and submitted to torture to make them disclose their hidden treasures.[4] Those *kulīnas* who were able to do so

1 Rhoads Murphey in the *Journal of Asian Studies*, Vol. XVI, pp. 181-200.
2 See *UCHC*, p. 359.
3 See *UCHC*, pp. 545 and 560.
4 *Pv.* Tr., p. 37.

escaped to areas in which Māgha's writ did not run. Their estates were given to Tamils and other foreign soldiers who took service under Māgha. The peasants as a whole had been accustomed for centuries to obey the *kulīnas* who had the specialised knowledge and experience that were required to run the public administration, including the maintenance of irrigation works. Deprived of their guidance, and the force that is always necessary to make the average man act for the common good, the peasants no doubt neglected their traditional obligations towards the state. Their new masters probably lacked the local knowledge necessary for employing them in the best interests of the state, and were concerned mainly with enriching themselves as quickly as possible. Even before Māgha's regime, in the time of Niśśaṁkamalla, the *kulīnas* appear to have been in disfavour with established authority; there is evidence in that monarch's inscriptions that his concern was to win the applause of the common man, and in his approach to them he passed over the local chiefs.[1] This, no doubt, would be applauded by modern political theorists who decry feudalism and wax eloquent on human rights and the equality of man. But the people, once they had been deprived of that guidance which made them labour for the good of the community, without any other motive for common action being placed before them, would have acted like sheep without a shepherd. The dangers to the body politic inherent in these developments appear to have been realised by the minister Āyasmanta in the reign of Kalyāṇavatī, who promulgated a code defining the duties of each social group,[2] but the disasters which followed no doubt contributed to the process of disintegration.

The seeds of the decay which became manifest in the Dambadeṇi period had been sown a century or two earlier. During the Coḷa conquest early in the eleventh century, and in the many unsuccessful revolts as well as in the campaigns which restored Sinhalese sovereignty, many thousands of lives must have been lost. The

1 See Galpota inscription, B, ll. 5-6, *EZ.*, II, p. 119, The masses whom Nissamkamalla wished to win over to his side were the *bahujanayā*, in contrast to the members of the Govikula of those days, whom he denounced (*EZ.*, II, p. 164).

2 See *UCHC*, p. 559.

long and generally peaceful reign of Vijayabāhu I gave an opportunity for the nation to recuperate, but the forty-two years of civil war which followed was a period of disintegration. The irrigation system was neglected, and in the wars of rival factions many thriving villages are said to have been destroyed without leaving a trace.[1] An era of development was inaugurated by Parākramabāhu, but his way to the throne was strewn with the dead bodies of thousands of his conntrymen. The several revolts in Rohaṇa, and the campaigns necessary to put them down, resulted in the death of thousands of able-bodied men. Parākramabāhu, it is true, developed the resources of the Island to a higher pitch than it had ever been raised before, but his prolonged foreign wars must have caused a great drain of manpower, and the high tempo of his administration left the country in a state of exhaustion at the end of his rule. The megalomania of Niśśaṁkamalla did not improve matters, and by the beginning of the thirteenth century, the healthier and the more physically fit section of the population must have been sacrificed to satisfy the ambitions of the two monarchs. Rohaṇa did not suffer from foreign invasions, but civil wars had been equally disastrous; this principality, too, must have contributed its levies to the armies sent abroad by Parākramabāhu. Thus, the manhood left to propagate the race must have been not the fittest and the most vigorous, and their progeny in the subsequent generations did not possess the necessary stamina of mind and body to cope with the difficult situations that they were faced with, both in struggling against adverse natural forces and in resisting the onslaughts of enemies from abroad.

There was another circumstance which made the invasions in the early part of the thirteenth century result in the breakdown of the administrative machinery, while the earlier invasions did not do so. In the later Anurādhapura period, i. e. two or three centuries preceding the Coḷa conquest, the Dakkhiṇa-desa (later Māyāraṭa) and Rohaṇa had each its own administrative headquarters where a replica of the set-up at Anurādhapura, on a smaller scale no doubt, was functioning. Edicts were issued by the *mahayā* in the Dakkhiṇa-desa and by the *āpā* in Rohaṇa, couched in the

1 See *UCHC*, p. 440.

same phraseology, dealing with the same type of dues and mentioning officials with the same designations as in those issued by the paramount king at Anurādhapura.[1] When the Sinhalese recovered the Rajaraṭa after a period of prolonged Coḷa occupation, the administrative organisation of Rohaṇa, which never completely succumbed to the Coḷas, was available to be re-established at Anurādhapura or Polonnaru. In the Polonnaru period, however, there was a tendency towards centralisation which reached its fullest development in the reign of Parākramabāhu I.[2] After that monarch had made himself the master of the Island, one hears no more of the Princes of the Dakkhiṇa-desa or of Rohaṇa. All state affairs were directed by the king in person from Polonnaru, and the autonomy of the Māyāraṭa and Rohaṇa was a thing of the past. No edicts issued by the *māyā* of the Dakkhiṇa-desa, or by the *āpā* of Rohaṇa are known in the Polonnaru period. This concentration of the administrative departments no doubt contributed towards efficiency so long as there was a strong ruler at the centre to direct affairs, and the state was powerful to defend itself against aggression from without or to deal with internal discord. But once the strong guiding hand was removed and the capital city sacked by invaders, the administrative machinery would have been dislocated with the loss of the archives and the dispersal or death of the bureaucrats. And there was no alternative organisation in the provinces from where the administrative system could be re-introduced. The tradition of the organisation was of course there, and we are told in the chronicles that Parākramabāhu II, after the Sinhalese state had been re-established in the Māyāraṭa, made an attempt to re-create it;[3] but, with very few who had actual experience of its working, this attempt does not appear to have succeeded.

Apart from maintaining garrisons at the capital city of Polonnaru and a few other places of strategic importance in the interior, Māgha appears to have been concerned more with holding certain seaports rather than in the administration of the interior, which he left to the control of the Tamil mercenaries serving under him.

1 See, for example, *EZ.*, III, No. 32 and *EZ.*, II, No. 11.
2 *CJSG*, II., p. 146.
3 Cv., lxxxiv, vv. 5ff.

The irrigation system, in these conditons, must have suffered neglect. When the Sinhalese temporarily regained control of Polonnaru towards the lattter part of the reign of Parākramabāhu II, that city is said to have been in a ruinous condition, the fields around it turned into forests and the irrigation channels not functioning properly.[1] Prince Vijayabāhu made a determined effort to restore the city and the irrigation works on which its prosperity depended, and achieved temporary success. The plight of the other ancient centres of population in the Rajaraṭa, and the tanks and channels in their neighbourhood, must have been much worse.

It must not, however, be imagined that the irrigation works, all failed to function at the same time, and that there was a mass exodus of population from the dry to the wet zone. The characteristic attachment of the peasant to the plot of land that he and his forefathers had been cultivating must have made him remain in his village, struggling to maintain an existence in spite of the adversities which he had to face. When the cultivation of the fields under one irrigation system became impossible, some of the peasants there must have found a livelihood in others which were still functioning. The famines and pestilences must have taken a fearful toll of lives, particularly among the women and children. Those who migrated from the Rajaraṭa to other districts must have been mainly the people of high birth and their immediate retainers. The villages under irrigation works that could be maintained by the local community wilhout the aid of the central government must have continued to function as before, but in course of time large tracts of land under the major irrigation works must have been abandoned and invaded by the forest. The people who remained in the villages not swallowed by these ever-enlarging forests came under the control of a new class of lords called *vanni*, 'forest chiefs'.[2]

What took place in the thirteenth century was not the migration of the dispossessd rulers of the Rajarata to the Māyāraṭa. When

1 *Cv*, lxxxviii., vv. 92-100 and 111-115.
2 Sec *UCHC*, pp· 736 ff.

invaders under Māgha gained control of the capital, a number of local chieftains in the Māyārata and Rohaṇa withheld their allegiance to the foreigner, and set themselves up as independent rulers. The population in these areas was augmented by the exiled nobles, their retainers and other people who came there to find a home free from the oppression they were subjected to in the Rajarata.[1] The limited areas of rice fields already existing in the wet zone could not feed this increased population, and large tracts of forests that had hitherto remained uncultivated were cleared and converted to fields or gardens, continuing and extending the process begun by Parākramabāhu I when he was the ruler of the Māyārata in reclaiming marshes in the Pasdun Kōralē.[2] The people who had migrated from the dry zone to the wet zone had to adapt themselves to the conditions of life in their new homes and form new dietary habits. The ghee and the edible oil extracted from sesamum, to which they had been accustomed in the Rajarata, were no longer available to them in sufficient quantity, and they had to acquire a taste for the coconut oil. Large areas were planted with this useful palm; the coastal belt between Kaḷutara and Bentoṭa is said to have been opened up as a coconut plantation in the reign of Parākramabāhu II. Whether coconuts formed an article of foreign trade at that time is not known, but in the Dambadeṇi period, the cinnamon plant and its fragrant bark receive their first mention in Sinhalese literature.[3] We are informed by the Portuguese hisorian Diogo do Couto that it was from the time of Dambadine Pandar Pracura Mabaga or Bao (Parākramabāhu II of Dambadeṇi) that 'the Island began to be famous in the world on account of the much and very fine cinnamon that its jungles produced.'[4] The demand for this commodity from the Arabs and other nations of the West was an important factor in the economy of the country, and was not without its repercussion on its politics, too. In the dry zone, the slash-and-burn system of cultivating rice and other cereals became more and more favoured with the spread of jungle and the deterioration of the irrigation system.

1 See *UCHC*, p. 446.
2 *Cv.*, lxxxvi, vv. 40-45
3 In the *Jātaka-atuvā-gātapada*, section yet unpublished.
4 *JCBRAS.*, XX (No. 60), pp. 65-66.

A few of the ancient irrigation works of moderate size, particularly those not far from the new centres of population in the wet zone, received the attention of the rulers of this period. The reservoir at Baḍalagcḍa (Badalatthalī in the narrative of Parākramabāhu's early career) was restored by Bhuvanaikabāhu IV or Parākramabāhu V, the king himself personally having visited the place, and the capacity of the tank was enhanced by diverting to it the waters of the Kospotu Oya which was dammed at a place named Alavaḷa. Large tracts of land irrigable by this reservoir, which had gone back to jungle, were cleared and converted into new rice fields. As much as ninety *yāḷas* of rice fields in an area measuring a *yotna* (about eight miles) on all four sides, irrigated by this reservoir were donated to the newly founded Laṅkātilaka-viṅāra.[1] Vanni Bhuvanaikabāhu III is credited with the construction of the Kuruṇāgala tank.[2] When this city, as well as Dambadeṇi and Yāpavu were the seats of royalty, the irrigation works in the surrounding country must have been functioning.

In the wet zone, too, rice cultivation can be extended by irrigation works of a type different from those stupendous undertakings in the dry zone. And the kings and nobles of this period are recorded to have undertaken such public works of a limited scope. The Laṅkātilaka inscription, in addition to the work at Badalagoḍa, mentioned above, refers to new rice fields opened up at Goḍavela to which irrigation facilities were provided by the construction of dams and channels. An inscription of the reign of Parākramabāhu V records that a certain dignitary restored to working order, after they had been abandoned for three or four hundred years, the dams and channels which irrigated rice fields in the area now called Hapugastanna near Mātale.[3] In the reign of Vikramabāhu III, five of the highest functionaries of state co-operated in opening a stretch of rice fields on land which had never before been utilised for that purpose, by forming a dam and a channel 735 cubits in length; the revenue accruing

1 The Laṅkātilaka rock-inscription (*JCBRAS.*, X, No. 34, pp. 83 ff) and the unpublished Alavaḷa-amuna inscription.
2 *JCBRAS.*, XXXII (No. 86), p. 261.
3 *JCBRAS.*, XXII (No. 65), pp. 362-3.

from the scheme was dedicated to the Tooth Relic.[1] Vijayabāhu IV, in the attempt he made to restore the Polonnaru kingdom, is said to have repaired the dams and channels of the Parākrama Samudra scheme, and opened up vast tracts of rice fields that had been abandoned for about half a century, and made the country around that city once more prosperous.[2] Parākramabāhu III, as we have seen, ruled from Polonnaru; after that we hear no more of this city, and it is not known for certain how long the conditions of prosperity created by Vijayabāhu IV lasted.

1 *RKD.*, p. 79.

2 *Pv.* (2), p. 48. Among the irrigation channels restored by Vijayabāhu IV, one named Mahasägā is particularly mentioned.

5

THE DISINTEGRATION OF POLONNARUVA*

AMARADASA LIYANAGAMAGE

In the survey of the events from the death of Parākramabāhu I, which we have so far made, the gradual but steady deterioration of the political situation in the island is clear. The central authority had weakened, and nearly all the rulers were deposed or slain before the normal termination of their reigns by the generals and other army officials, who appear to have been the arbiters of the political destiny of the times. We have also referred to the struggle for power which ensued between rival factions, who had their own nominees for the throne. It was when the affairs of the country were in this state of confusion that Māgha invaded Ceylon.[1] His 24,000 strong army looted, plundered and sacked Rājaraṭṭha on an unprecedented scale....

In our survey of the political history of the period from the death of Parākramabāhu I, we have seen the gradual disintegration of the Polonnaruva kingdom until the conditions were further aggravated by the invasion of Māgha. The political conditions

* Reprinted from Amaradasa Liyanagamage, *The Decline of Polonnaruwa and the Rise of Dambadeniya* (Colombo, 1968), pp. 67-75.

1 *Cv.*, LXXX, 54-80.

prevalent at the time are reflected in a passage of the *Hatthavanagallavihāravaṃsa* describing the condition of the country on the eve of the invasion of Māgha:

'When (those) many lords of Laṅkā, who were like unto ornaments to (the island of) Laṅkā, who were endowed with immensely meritorious and miraculous prowess, who were devoted to the Triple Gem, (had passed away) leaving but their aura of glory, and when the (other) lords of Laṅkā who had gone astray from the path of justice, who were deficient in the customary canons of statecraft, who (were) weaklings lacking in fortune (*bhāgya*), and also when the ministers of similar nature were living embroiled in mutual antagonism, then as a result of a heinous evil deed committed by the dwellers of Laṅkā in the past, the enemy forces from different regions who were ignorant of the Dispensation of the Teacher, who have entered the thicket of wrong beliefs, having arrived here from the Jambudīpa converted the whole island of Laṅkā into one of confusion and danger'.[1]

Though the description is garbed in general terms it appears to be a summary of the troubled politics of the period. The *Hatthavanagallavihāravaṃsa* was composed in the reign nf Parākramabāhu II , and therefore its author was removed from these events by less than about seventy-five years, so that the calamities referred to would not have faded away from living memory. We have already discussed the activities of the kings 'who were deficient in the customary canons of statecraft' and also 'the ministers of similar nature who were living embroiled in mutual antagonism', and the political confusion which resulted. A Sinhalese version of the Pali text cited above, compiled in the reign of

1 *atha Laṅkālaṅkārabhūtesu visālapunniddhivikkamesuratanattayamāmakesu anekesu Laṅkānathesu kitti punjāvasesesu jātesu apetanītimaggesu rajjaparipālanocitavidhānavirahitesu mudubhūtesu nihīnabhāgadheyyesu Laṅkissaresu tā-lisakesu eva saciva janesu ca yebhuyena annamannaviruddhesu Laṅkāvasīnam purākatena kena pi dārunena papakammuna nanadesavasino aviditasatthusamaya pavitthamicchaditthigahaṇa paccathisena Jambudīpa idhagamma sakala Lankādīpam anekataṅkasaṅkulam akaṣi, Hvv.*, 30: Paranavitana made reference to this passage in his Sahitya Day (1959) address at Dambadeniya, see *Sammelana Satahan*, 23.

Parākramabāhu VI adds that the kings were 'of diminished power of command' (*pirihuṇu ājñā-bala āti*).[1] That the kings of this period were of less consequence is also reflected in the literary works.

An interesting passage in the *Rājāvaliya* goes on to explain the division of the kings of Ceylon into the Greater Dynasty (*Mahāvaṃsa*) and Lower Dynasty (*Cūlavaṃsa*) in these words:

"The Lower Dynasty is distinguished by the father or mother (of the reigning sovereign) being a descendant of the Solar line. It is designated "Lower Dynasty" because the pedigree of the sovereigns is heterogeneous, being a mixture between the descendants of those who brought the sacred Bodhi Tree and those who brought the Tooth Relic; because of the non-existence of Buddhist clergy endowed with supernatural powers; because Sakra does not protect this illustrious Laṅkā; because Anurādhapura declines for want of meritorious peronages; and because the produce of agriculture is failing. The Lower Dynasty commences with the reign of Kitsirimevan, son of Mahāsena."[2]

It must be noted that, according to these works some of the greatest Sinhalese kings such as Vijayabāhu I and Parākramabāhu I also belonged to the *Cūlavaṃsa*. The explanation given in the passage cited above, therefore, is not justified. However, it appears that these writers record impressions of an age of decline in later times, although it has been traced back to ancient times. The reference to the decline in agriculture is particularly noteworthy. This passage, as well as that cited above from the *Hatthavanagallavihāravaṃsa*, seems to bear some hints as to why the later kings were not considered equal in rank to their predecessors. A period of decline, politically as well as economically, is portrayed in them. We propose to consider that aspect in the sequel.

Before we take up the invasion of Māgha for consideration, it would not be irrelevant to draw attention to the dislocation

1 *Elu Attanagaluvamsaya*, 67. Ed. R, Tennakon (Colombo, 1954).
2 *Rajavaliya*, ed. B. Gunasekara, 37 (Colombo, (1953); we have modified Gunasekara's translation slightly.

of the administrative machinery and the decline of the economic life of the country in the period which followed the death of Parākramabāhu I. Beneath the disintegration of the political unity of the country, which we have already discussed, one can also notice the tendencies towards a declining economy. The administrative machinery itself was showing signs of stress before it suffered heavily at the hands of the ruthless invader Māgha. We propose to take note of them here, not only because they have a bearing on the decline and ultimate abandonment of the Polonnaruva kingdom as well as the success with which Māgha established his power in the Rājaraṭṭha, but also it would bring into clearer perspective the circumstances in which the Dambadeṇi kingdom was founded, and the background to the problems with which its rulers grappled almost throughout their rule.

When one considers the heights which the political and economic power of the country attained during the reign of Parākramabāhu I, it is indeed surprising that this kingdom disintegrated and was virtually abandoned by the Sinhalese kings less than half a century after his death. Parākramabāhu not only established his authority throughout the island, but maintained his garrisons in South India and made his presence felt in that region for over a decade.[1] We have also referred to his campaigns against Rāmañña, although his success in these ventures appears to have been limited. As a tank-builder, Parākramabāhu stands out not only for the large number of tanks credited to him in the *Cūḷavaṃsa* but also for their remarkable size[2]. Taking the archaeological remains into consideration, if Niśśaṅkamalla's edifices are left out, Polonnaruva could well be regarded as the city of Parākramabāhu.[3]

If this position continued well into the last quarter of the 12th century until the death of Parākramabāhu in 1186, it would be by no means an easy task to explain the speedy decline and disintegration which set in soon after his death. The chroniclers

1 A. Liyanagamage, *op. cit.*, 34–41.

2 *C.H.J.*, IV, 52–68.

3 Paranavitana, *C.H.J.*, IV, 69–90.

themselves seem to have found it difficult to understand the reasons for it, and were satisfied by attributing the ruthless destruction caused by Māgha to the negligence of the gods who were entrusted with the protection of Laṅkā.[1]

A closer examination of the available data, however limited they may be, would make it clear that the edifice which Parākramabāhu so painfully built perhaps contained the seeds of its own decay. Soon after he disappeared from the scene, the repercussions of the policies he followed began to have considerable impact on the developments that followed.

The *Cūlavaṃsa* in its account of Parākramabāhu's immediate successor Vijayabāhu II (1186–87) makes an interesting statement:

'When he had received consecration as a king, the prudent one in his great mercy released from their misery those dwellers in Laṅkā, whom his uncle sovereign Parākramabāhu had thrown into prison and tortured with stripes or with fetters. By restoring at different places to various people their village or their field he increased the joyfulness of them all'.[2]

This seems to be an unhappy epilogue to the epic of Parākramabāhu and is not without significance. Unfortunately, no epigraphic testimony from the reign of Vijayabāhu II which may throw light on the accusation of the chronicler, is forthcoming at present. In fact the only epigraphic record, the Polonnaruva Slab Inscription which until recently was believed to have belonged to this ruler[3], has now been attributed to Niśśaṅkamalla. In the new edition of this inscription, including side B which remained unpublished, Paranavitana has shown quite convincingly that it belongs to Niśśaṅkamalla but not to Vijayabāhu II[4]. This record, however, does refer to the consecration of Vijayabāhu and the political

1 *Cv.*, LXXX, 54 *ff*; *Hvv.*, 30; *Pujavaliya*, 108.
2 *Cv.* LXXX, 1-3.
3 *EZ*, II, No. 30, 179-84
4 *EZ*, V, No. 17, 196–208.

upheavals caused by 'villainous ministers' (*duṣṭāmātyayan*) who had become traitorous (*rājadrohīva*)[1]. But no reference which has a bearing on the *Cūlavaṃsa* statement is found in this record. Therefore the validity of the chronicler's accusation against Parākramabāhu has to be tested with any other available evidence.

Geiger has observed a hiatus in the manuscripts of the *Cūlavaṃsa* at this point, as shown in the previous chapter, which opens with an account of Parākramabāhu's immediate successor on the thorne.[2] It is noteworthy that the indirect blame attributed to Parākramabāhu in the passage cited above, is in strange contrast to the tone of the preceding chapters, which extols the greatness of this ruler. We are therefore inclined to favour the view that, at Chapter LXXX the narrative was resumed by some other compiler who held different opinions from those of the chronicler who previously glorified Parākramabāhu[3]. If this is the case, we have to believe that the compiler of the latter portion of the *Cūlavaṃsa* had not the same unstinted praise for this ruler. In any case, the passage in question is significant in so far as it throws some welcome light on a less known aspect of Parākramabāhu's reign, which had a bearing on the developments that followed. The chronicler's charge against the latter for his excesses does not seem to be altogether unfounded.

We have also similar evidence of the rigours to which the people were subjected by Parākramabāhu in some of the lithic records of Niśśaṅkamalla (1187-96). In the Galpota Inscription it is stated that many people in Laṅkā lost their family privileges and wealth 'through the unjust acts of some kings'.[4] It is further stated that he remitted taxes for five years, and enacted a law that 'excessive taxes imposed by former kings' should not be taken and laid down the terms on which the taxes on lands and fields were to be collected, depending on the degree of fertility in each case. The *chena* cultivators 'who carried on with difficulty' were completely relieved of such taxation.[5]' In spite of the propagandist

1 *EZ.*, V, No. 17, 205, lines 23—26.
2 *Cv.*, I, Introduction, iv.
3 Sirima Wickramasinghe, *The Age of Parakramabahu I*, Ph. D. Thesis (unpublished), 1958, University of London, Chapter I; *U.C.H.C.*, I, Pt. II 48—86.
4 *EZ.*, II, No. 17, p, 110, lines 15—16.
5 *EZ.*, II, p. 110, lines 16-20; *ibid*, I No. 9, lines 7-10.

style of Niśśaṅkamalla's records, these statements, occurring as they do in the lithic records as well as the *Cūlavaṃsa*, cannot be lightly dismissed. However, they should not be pressed too far.

Parākramabāhu's military undertakings abroad, which were expected to add lustre to his crown, seem to have demanded heavy sacrifices from the people of Ceylon. His intervention in the Pandyan war of succession in particular, led to a protracted struggle spread over a period of not less than a decade.[1] The payment and maintenance of garrisons on foreign soil for so many years would have led to heavy taxation and other exactions, unless they were maintained by levies in South India or by booty. And we have seen that, though some success was achieved at the beginning, his South Indian campaigns had ended in defeat.[2] There is no evidence that these ambitious military undertakings earned for the country any political or economic benefits. On the other hand, there is reason to believe that they led to a considerable drain on the human and material resources of the country, even if we assume that part of the cost was met by booty. This, however, is not to suggest that these ventures led to adverse consequences which manifested themselves immediately. One must note that, in spite, of these costly expeditions Parākramabāhu had sufficient resources to undertake massive irrigation works and extensive building activities, which are amply testified to by the archaeological remains in Rājaraṭṭha. The repercussions of these policies were to be felt in the decades that followed his death. The measures adopted by Vijayabāhu II and Niśśaṅkamalla to relieve the suffering of the people burdened with heavy taxes, as well as the references to people whom Parākramabāhu 'had thrown into prison and tortured with stripes', and the restoration of the villages and land of which they had been deprived, may be taken as a reflection of the exactions imposed by Parākramabāhu on his subjects.

True enough, Parākramabāhu developed the country by undertaking great irrigation projects. In Dakkhinadesa marshy land was cleared and rendered cultivable.[3] In Rājaraṭṭha a massive programme of

1 *EZ.*, II, p. 110, lines 16—20; *ibid* , I, No. 9, lines 7—10.
2 *Cv.*, LXXVII, Nilakanta Sastri, *C.H J.*, IV, 33—51.
3 *Cv.* Tr., II, 100 note 1; *C H J.* IV, 46—51.

irrigation was undertaken. Similarly he was strong enough politically as well as economically, to outdo his predecessors by resorting to conquests beyond the shores of Ceylon. His expeditions abroad, however, in the long run, seem to have added to and speeded up the decline of the Polonnaruva kingdom.

The elaborate administrative machinery which Parākramabāhu set up served him well as long as he was there at the centre to direct the affairs but, when his strong hand was no longer there, his successors were hardly equal to the task of exercising adequate control over it The complicated irrigation system, as shown by Murphey Rhoads, presupposes a highly organised and centralised administration.[1] Once the controlling hand of Parākramabāhu was removed, the close knit fabric of administration gave way and could no longer function smoothly. We have already seen the difficulties of Niśśaṅkamalla in his attempts to keep his kingdom intact.[2] He was faced with the problem of keeping in check a host of officials whose allegiance was no longer a matter of course. The out-lying provinces such as Rohaṇa do not appear to have heeded the command of the king at Polonnaruva as readily as was expected of them.[3]

It is possible that excessive centralisation of the administration also produced unfortunate results. If Parākramabāhu's policy led to a weakening of the institutions of local administration, which served as useful organs through which the central authority could make its command reach the people, that again would have helped the tendencies towards disintegration. This appears to have been the course of events. Paranavitana has drawn attention to the disappearance of the princes of Dakkhiṇadesa and Rohaṇa during this period.[4] The *mahayā* of Dakkhiṇadesa and the *āpa* of Rohaṇa appear to have had an administrative machinery, considered to have been almost a replica of the central administration which functioned at the capital.[5] Paranavitana summarises the position in these words:

1 *C.H J.*, IV, 51—68.
2 *J.A S.*, XVI, 194—95.
3 A. Liyanagamage, *op. cit.*, 47—49.
4 *C J S.G.* II, p 23. Inscription No. 386; Muller, *A.I C.*, No. 152-a, *EZ*, III, No. 35, 29—31.
5 *U.C.H C.*, I, pt. II, 717, *Srī Laṅkadvīpayehi bahunāyakatvaya sē rājya sūtraya pavatvami yi sitā*, *Nikāyasaṅgrahaya*, 85.

'The centralisation of the administrative departments no doubt contributed towards efficiency so long as there was a strong ruler at the centre to direct affairs, and the state powerful enough to defend itself against aggression from without or to deal with internal discord. But once the strong guiding hand was removed and the capital city sacked by invaders, the administrative machinery would have been dislocated with the loss of the archives and the dispersal or death of the bureaucrats.'[1]

Once the administrative machinery was weakened, it would have been a very difficult task to maintain in good repair the elaborate irrigation system, which was the basis of the Sinhalese kingdom. Among the successors of Parākramabāhu on the throne of Polonnaruva, hardly any king with the possible exception of Niśśaṅkamalla who probably undertook some restoration work, appears to have paid any attention to irrigation, quite apart from building new tanks on their own.[2] Once the irrigation works were neglected for want of repair, people could no longer continue agriculture with any assurance of good harvests.

It has been postulated that agriculture practised over a long period on a single crop basis would have led to the exhaustion of the soil, which ultimately led to the abandonment of Rajaraṭṭha by its inhabitants.[3] The *Rājāvaliya* has a vague statement in drawing a distinction between the kings of the *Mahāvaṃsa* and those of the *Cūlavaṃsa*, that one of the reasons for this division was that Anurādhapura declined for want of meritorious personages, and that agriculture and horticulture were yielding less and less produce.[4] Murphey Rhoads – himself a geographer who has given thought to this problem – has shown that this supposition is unfounded.[5] No evidence has so far come to light which could warrant the assumption that a change in the climate resulted in the abandonment of Rājaraṭṭha. In these circumstances we are inclined to the belief that the decline of the irrigation system was to a large extent due to the weakening of the administrative machinery, consequent

1 *U.C.H C.*, I, pt. II, 717.
2 *CV.*, LXXX, 1-80
3 H. W. Codrington *J. C. B. R. A. S.*, NS. VII, p. 93 ff ; Sorata, Introduction to his edition of *Daladā Sirita*, XLV-XLVI (Colombo, 1954).
4 *Rājāvaliya*, 37
5 *J. A. S.*, XVI, 190-92.

on the political confusion spread over several decades, punctuated by foreign invasions which added to the confusion spread from time to time. These kings were hardly equal to the task of commanding the vast mass of labour and material resources required to maintain the elaborate network of irrigation schemes.[1] Estimates of the labour required, made by modern engineers who have studied irrigation in Ceylon, do not seem to minimise the magnitude of the task.[2] The weaklings on an ever uncertain throne, would hardly turn their attention to irrigation. Nicholas has shown that irrigation was undertaken on a large scale, precisely during those periods when the country enjoyed comparative peace and stability.[3]

Some scholars have expressed the view that malaria also would have been one of the factors which led to the abandonment of Rajaraṭṭha. Codrington has given considerable emphasis to this factor.[4] Rhoads has postulated the possibility that since malaria was known in the Mediterranean lands and China at a much earlier date, it would have reached Ceylon through South India in the course of time.[5] Paranavitana is not in line with this view, and his words may be quoted here:

"Malaria it is true, has been very effective in preventing the re-occupation of these regions during a period of about seven centuries after their virtual abandonment in the Dambadeṇi period. But whether malaria was the cause or the consequence of that abandonment is a debatable point".[6]

We are inclined to favour the latter view. Codrington refers to the map of Plancius (1592 A. D.) in which an entry in Portuguese reads: 'Kingdom of Jala deserted and depopulated for (three hundred) years by reason of unhealthiness' [7] The identification of Jala with Yāla in the south-east of Ceylon may be conceded, but it would be unsafe to rely on the figure of 300 years, which must have been based on popular tradition. Even if the figure is taken literally, it would only take us

1 W. L. Strange, *Report on Irrigation in Ceylon*, 13 (Colombo, 1909).
2 R. L. Brohier, *Ancient Irrigation Works*, II, 37, (Colombo, 1934).
3 *J. C. B. R. A. S.*, NS, VII, 43-64; *C. H. J.*, IV, 52 ff.
4 *J. C. B. R. A. S.*, NS. VII, 101-102.
5 *J A. S.*, XVI, 198-200.
6 *U. C. H. C.* I, Pt. II, 715.
7 *J C. B. R. A. S.*, NS. VII 102, cited by Codrinton

back to the end of the thirteenth century. By that time Rājaraṭṭha had been abandoned, and a whole dynasty of kings had ruled from Dambadeṇiya. Murphey Rhoads had not produced stronger arguments so that, in the absence of valid evidence, this explanation is at best a guess.

The real problem is whether malaria had taken such an endemic form at such an early date, and no evidence is forthcoming to establish the proposition that malaria was one of the factors which led to the abandonment of the Rājaraṭṭha. The *Haṭṭhavangallavihāravaṃsa*, which deals with the *vihāra* of that name and the life and reign of king Sirisaṅgabōdhi (247–49 A. D.), speaks of a drought and famine which occurred during the reign of the latter. These calamities were accompanied by the visit of a *rakkhasa* (demou) called Rattakkha (red-eyed), whose very sight turned the eyes of the people red, as they were infected with *jararoga* (disease accompanied with fever) called *raṭṭakkhamāraka*. The disease always ended in the death of the victims and the demon devoured the corpses with relish. Anyone who happened to see a patient who had caught this fever was also infected. It is further stated that the entire province was depopulated on account of the fear of this demon and the disease.[1] The *Mahāvaṃsa* refers to these calamities which took place in the reign of Sirisaṅgabōdhi, but does not make direct mention of the *jararoga*.[2] We would hesitate to interpret this passage as referring to malaria, although the disease if it actually spread, would have taken toll of a substantial number of human lives. Our hesitation is based on several grounds. Firstly, the events described therein refer to a time as early as the third century A D. The *Haṭṭhavanagallavihāravaṃsa* appears to have borrowed much of its material pertaining to the reign of this king from the *Mahāvaṃsa*, and the two versions agree to a very great extent, although the *jararoga* is not mentioned in the latter chronicle. Secondly, fever can be of various types, some of them infectious, at times perhaps reaching epidemic proportions. In times of drought, such as the devastating one which took place in the reign of Vaṭṭagāmaṇī Abhaya (89–77 B. C.), so vividly described in the Buddhist Commentaries, disease would naturally have taken considerable toll of human lives.[3] But it would not be possible

1 *J. C B R. A. S.*, NS, VII, 102, cited by Codrington.

2 *Hvv.* 15, *evam naciren eva yakkhobhayena rogena ca janapado viraḷajano jāto.*

3 *Cv.* XXXVI, 73-97.

to conclude thereby that it had a debilitating effect on the entire population, leading in turn to the decline and collapse of the medieval Sinhalese kingdom as a whole. Thirdly, the narrative in question is garbed in myth and legend to such an extent that it would be unsafe to pick out a detail and rely on it. We can be certain that, at least until the end of 11th century, malaria had not become a threat when we take into account the vigour of the Sinhalese kingdom, distinctly seen throughout the long reign of Parākramabāhu I (1153–1186). As Paranavitana has rightly pointed out, a population living under such conditions leading to debilitation, would not have been able to produce the remarkable monuments extant in Anurādhapura and Polonnaruva, or the vast irrigation projects.[1] In these circumstances we are inclined to rule out the possibility that malaria was a factor which led to the abandonment of the Rājaraṭṭha.

Returning to our survey of the decline of the economy, the debasement of the metal and disappearance of the gold coinage during this period is noteworthy. In the last centuries of the Anurādhapura kingdom, there is evidence to show that a considerable gold coinage was in circulation.[2] By the time of Vijayabāhu I, the metal used was debased and the gold coinage had practically disappeared. During the reign of Parākramabāhu I and in the period that followed the metal used was virtually copper. In his study of lhe coins and currency of Ceylon, Codrington has clearly shown this marked decline of the coinage [3] It is believed that the policies of Parākramabāhu, particularly his ambitious military undertakings abroad, led to this disappearance of the gold coinage, resulting from the drain of the country's resources.[4] Undoubtedly the maintenance of garrisons in foreign lands was expensive and the mercenary soldiers had to be paid well, and the chronicle bears ample testimony to the confusion they created when kings failed to do so.[5] But it would be unfair to blame Parākramabāhu on this matter, for the debasement of the currency was already well marked in the reign of Vijayabāhu I.[6] Moreover, the disappearance of the gold

1 *Sammohavinodanī*, P. T. S. ed., p. 449 ff.
2 *U. C. H. C.* I, pt. II 715.
3 H W. Codrington, *The Coins and Currency of Ancient and Medieval Ceylon*, 11 ff. (Colombo, 1924).
4 *Ibid*, p. 73.
5 *U. C. H. C.* I, pt. II, 551; see also Codrington, *J. C. B. R. A. S.*, NS. VII, 100–101.
6 *CV.*, LV, I ff; LXXVI, 133; XC, 12 ff.

coinage and the general debasement of currency cannot be taken as an unmistakable sign of the decline of the economy. For, it may even point to the contrary, as such a change might have taken place as a result of an expansion in the volume of trade, which made it difficult to meet the requisite supplies of gold, in a country where this metal is scarce. Hence, the debasement of the coinage cannot be taken as a safe indication of a general decline in the economy.

Foreign invasions appear to have been a menacing phenomenon in the early history of Ceylon. Invaders added to the political confusion in the island from time to time. But it would be an oversimplification to attribute the collapse of the Polonnaruva kingdom to foreign invasions. No doubt, as we shall see in the sequel, Māgha appears to have been ruthless in his recourse to violence and destruction.[1] His oppressive policies forced the princes and nobles to leave Rājaraṭṭha in search of safer homes in the southern and south-western parts of the island. On the other hand, from our discussion so far, it would clearly emerge that Māgha invaded Ceylon when it was beset with a tottering economy and political chaos resulting from internecine struggle for power among rival factions and a weakened administration with diminished royal authority. In these circumstances, the quick success which Māgha achieved on invasion cannot cause much surprise. This, however, is not to suggest that Māgha's sack of Rājaraṭṭha was the sole cause of the abandonment of the Rājaraṭṭha by its rulers and inhabitants. Rather, it was the cumulative result of the operation of several factors, each in varying degree, to which we have drawn attention in the foregoing discussion.

1 A. Liyanagamage, *op. cit.*, Ch. IV.

6

INVASIONS FROM SOUTH INDIA AND THE ABANDONMENT OF POLONNARUVA*

K. INDRAPALA

The death of Niśśaṅkamalla in 1196 marked the end of an era of comparative security, beginning from 1070, during which the island was not plagued by foreign invasions. Internal dissensions created by rival aspirants to power and foreign aspirations for control of the affairs of the island came to a head almost immediately after the demise of Nśśaṅkamalla. Princes from the Cōḷa, Pāṇḍya and Kaliṅga countries exploited the weakness of the Sinhalese rulers, swooped on the island at quick intervals and succeeded in holding power for short periods. To add to this chaotic state, petty king-makers were active at Polonnaruwa enthroning and dethroning their favourites. The rapid deterioration of the political situation culminated in the onslaught of Māgha in 1215, the like of which was perhaps not known earlier. The impact of Māgha's occupation of the Rāja-raṭṭha was tremendous. The Sinhalese rulers were almost permanently

* From K. Indrapala, *Dravidian Settlements in Ceylon and the Beginnings of the Kingdom of Jaffna*, Thesis submitted in 1965 to the University of London (Ph.D. 1966. Unpublished), pp. 236—262. The concluding paragraph was written specially for this symposium.

ousted from the northern parts of the island. A considerable proportion of the Sinhalese people, too, began the abandonment of that area. The occupation of the Rājaraṭṭha by Tamil and Kerala elements became more marked and permanent. For nearly seven decades this part of the island became an arena for the contest for power among different foreign contenders, chiefly Māgha and his associates. The Pāṇḍyas settled the contest to their advantage and paved the way for the rise of a dynasty from the Tamil country in the newly founded kingdom of that region....

The first important feature of this period (*thirteenth century*) is the renewal of foreign invasions almost immediately after the death of Niśśaṅkamalla. Within the short span of twenty years beginning from 1196 there were at least eight invasions of the island, most of which were led or inspired by the Cōḷas. These are referred to in the South Indian and Ceylonese inscriptions and in the literary works. In the reigns of Parākramabāhu I and Niśśaṅkamalla there were Ceylonese invasions of South India and, possibly, counter invasions from the mainland.[1] Sinhalese troops were supplied to Pāṇḍya princes in their wars against the Cōḷas and the Cōḷa-supported rivals. Although the Sinhalese forces won initial successes, in the end they seem to have lost to the Cōḷas.[2] One such victory over the Sinhalese is claimed by Kulottuṅga III in the ninth year of his reign (A D. 1187).[3] From his tenth year (1188) this monarch claims the conquest of Ceylon in his inscriptions.[4] The ruler of Ceylon in 1188 was Niśśaṅkamalla, who would then have been on the throne for hardly a year. It seems likely that there was a Cōḷa invasion of the island at this time, if we take the vague and fragmentary statement in the Galpota inscription of Niśśaṅkamalla, namely 'Laṅkā in times gone by...

1 *Cf.*, S. Wickramasinghe, *The Kalinga period of Ceylon history, 1186—1235 AD.*, M.A. dissertation submitted to the University of Ceylon, Peradeniya, in 1956 (unpublished); S. Wickramasinghe, *The Age of Parakramabahu I*, Ph.D. thesis submitted to the University of London in 1958 (unpublished); A. Liyanagamage, *The Decline of Polonnaruwa and the Rise of Dambadeniya*, pp. 34—51 (Colombo 1968).

2 *Ibid.*; also S. Wickramasinghe, 'Successors of Parakramabahu I: Downfall of the Polonnaru Kingdom', *UCHC*, I, pt. 2, pp. 521—525.

3 *South Indian Inscriptions*, III, ed. E. Hultzsch, p 86 (Madras 1899).

4 A. Butterworth and V. Venugopal Chetty, *A Collection of Inscriptions on Copper Plates and Stones in the Nellore District*, Pt. I, No. 85 (Madras 1905).

thinking it was dangerous and annoyed' (*Lakdiva pera davasä... napurä yi dähä vä..*), to refer to some foreign intervention at the beginning of his reign.[1] Kulottuṅga III may have taken advantage of the confusion that ensued the death of Parākramabāhu I and invaded the island. That the conquest of Ceylon was not effected in 1188 is admitted in a Cōḷa inscription of 1194, in which Kulottuṅga is recorded to have ordered his troops to conquer the island in that year.[2] The claim in the inscription of 1188 is, therefore, an exaggeration based probably on a futile invasion of the island. It is not possible to think that any success in this direction was achieved by the Cōḷa ruler before 1196, the year of Niśśaṅkamalla's demise. Kullottuṅga's next claim of victory over Ceylon is made in his inscription of 1199 from Tirumāṇikkuḷi [3] The ruler of Ceylon in 1199 was Queen Līlāvatī, whose rule was chiefly guided by the able general Kitti. Kulottuṅga's claim in 1199 does not appear to be altogether unfounded. In a Sinhalese poem called *Sasadāvata* composed in the time of Līlāvatī, there is an allusion to three invasions from the Cōḷa country which were successfully checked by the general Kitti.[4] The commentary (*sanne*) on this poem gives certain details of these invasions. It is stated that on two occasions the invading armies landed at Māvaṭu (*Mahātittha)* and proceeded as far as Anurādhapura before they were defeated. On the third occasion, they proceeded from Salāvat (Chilaw) as far as Srīpura in Dakkhiṇadesa. They were all defeated by Kitti [5] Kitti was a general, presumably in the armies of Parākramabāhu I and Niśśaṅkamalla, who ousted Cōḍagaṅga from the throne and enthroned Līlāvatī in 1197.[6] He was ousted from power in 1200.[7] The three invasions alluded to in the Sinhalese poem must have, therefore, taken place before 1200 and probably after 1197. It is,

1 D. M. de Z. Wickramasinghe, 'Polonnaru: Galpota Inscription of Nissankamalla', *EZ*, II, p. 112; S. Wickramasinghe, 'Successors of Parākramabāhu I....', p 523.

2 *Annual Report on Epigraphy for 1907*, (Madras), Inscription No. 288 of 1907 from Tiruvidaimarudur.

3 F. Kielhorn, 'Dates of Chola Kings'; *Epigraphia Indica*, VII, p. 174 (Calcutta, 1902); *South Indian Inscriptions*, III. p. 205.

4 *Sasadāvata*, ed. Aturuvalle Dhammapāla, p. 5 (Colombo 1934); S. Paranavitana, 'Three Chola Invasions of Ceylon not recorded in the *Mahavaṁsa*', *JCBRAS*, XXXI, pp. 384—385.

5 *Ibid.*

6 S. Wickramasinghe, 'Successors of Parākrambāhu I...', p. 516.

7 *Ibid.*

possible, however, that one or two of the invasions took place in the period before 1197 when Kitti was probably one of the generals of Niśśaṅkamalla. The claim of the Cōḷa king in 1199 was very probably based on one of these invasions. Nilakanta Sastri doubts the validity of the Sinhalese account on the ground that the *sanne* on the *Sasadāvata* is of a later date.[1] But even if we dismiss the details provided by the *sanne*, the evidence of the *Sasadāvata*, a work contemporaneous with the alleged invasions, cannot easily be set aside. The next and the last claim of Kulottuṅga is made in an inscription of 1212 from Pudukkottai where the conquest of Ceylon is referred to as already accomplished.[2] This claim is perhaps based on the successful invasion of the island in 1209, which appears to have been Cōḷa-inspired. It is referred to in the *Cūlavaṃsa* and in the contemporary Sinhalese inscriptions. In the Bōpiṭiya inscription of Queen Kalyāṇavatī (1202–1208), it is recorded that the queen had to leave Miṇipē on account of a Tamil invasion.[3] This Tamil invasion is also mentioned in the Miṇipē inscription of the same queen, dated in her eighth regnal year.[4] According to this record, the general Āti repelled this invasion but lost his life. On the other hand, it is stated in the *Cūlavaṃsa* that in 1209 the Mahādipāda Aṉīkaṅga 'came at the head of a great army from the Cōḷa kingdom, slew the ruler in Pulatthinagara, Prince Dhammāsoka, together with the general Āyasmanta and reigned seventeen days'.[5] The invasion referred to in the Miṇipē inscription and the invasion of Aṉīkaṇṇa have been treated as identical and rightly so.[6] The claim of conquest in the Pudukkottai inscription may be, therefore, a reference to this short-lived conquest achieved by Cōḷa troops with Aṉīkaṅga at their head. Buti t is also possible that it refers to the Cōḷa invasion in the reign of Lokeśvara (1210-1211), alluded to in the Koṭṭaṅgē inscription.[7] After 1212 neither the South Indian nor the Ceylonese sources mention any Cōḷa invasion of the island.

1 K. A. Nilakanta Sastri, *The Coḷas*, p. 412, n. 76 (Madras 1955).
2 T. Desikachari, *Inscriptions (Texts) of the Pudukottai State*, No. 166 (Pudukottai 1929); K. A. Nilakanta Sastri, *The Colas*, p. 383.
3 D. M. de Z Wickremasihghe, 'Bopiti Slab Inscription of Kalyanavati' *EZ*, II, pp. 190—192.
4 S. Paranavitana, 'Minipe Slab Inscription', *EZ*, V, pp. 157—158.
5 *Cv.*, 80:43—44.
6 S. Paranavitana, 'Minipe Slab Inscription', p. 159; A. Liyanagamage, *op. cit.*, p. 64.
7 S. Paranavitana, 'Kottange Rock Inscription of Lokesvarabahu', *EZ*, IV, p. 87.

Apart from the Cōḷa invasions mentioned above, there were two other invasions from South India which occurred shortly before the onslaught of Māgha. One was led by a Sinhalese aspirant Lokeśvara, who brought 'a great Damiḷa army from the opposite shore, brought the whole of Laṅkā under his sway and reigned, dwelling in Pulatthingara, nine months'.[1] It has been surmised that this Damiḷa army could not have been from the Cōḷa country, for Lokeśvara was no particular friend of the Cōḷas, as is shown by the subsequent Cōḷa invasion of the island during his reign.[2] But it is possible that this Tamil army was only a mercenary force and may have come from either the Cōḷa or the Pāṇḍya country. The invasion does not necessarily postulate an alliance with any of the South Indian rulers. The last South Indian invasion before that of Māgha is claimed to have been led by a Pāṇḍya prince Parākrama, who succeeded in capturing power and ruling for three years.[3]

The quick series of invasions which began after the death of Niśśaṅkamalla culminated in that of Māgha, who has been described in the chronicles as a Kaliṅga and sometimes as a Tamil.[4].....

The conquest of northern Ceylon by Māgha and his troops is one of the most dramatic events in the history of the island, with far-reaching results in the lives of the Sinhalese and the Tamils. For the Sinhalese this was a tragic event and its memories were preserved in fairly genuine traditions which came very early to be incorporated in the Sinhalese and Pali chronicles. For the Tamils it was an event which widely opened the doors to the occupation and colonisation of northern and eastern Ceylon amidst the instability and the turbulence that characterised the history of the old Rājaraṭṭha in the thirteenth century. At a time like this no genuine traditions of the events were preserved by them until a stable kingdom was established there. When genuine traditions failed, others, based partly on later events, were supplied to meet the needs of a later period. In the chronicles of Jaffna, these traditions centre round the personality of Vicaya Kūḷaṅkai Cakkaravartti, who, as we shall

1 *Cv.*, 80:47—48.
2 S. Paranavitana, 'Kottange Rock Inscription....', p. 88; S. Wickramasinghe, 'Successors of Parākramabāhu I....', p. 520.
3 *Cv*, 80:52—53.
4 *Ibid*, 80:58; 83:15.

later see, was in all probability no other than Māgha or Vijaya Kāliṅga Cakravarti.[1] In the chronicles of Batticaloa more genuine traditions seem to have been preserved and the invasion of Māgha (Mākōṉ) occupies an important place in these.

It is the accounts in the Sinhalese and Pali chronicles, especially those of the *Cūlavaṃsa* and the *Pūjāvaliya*, that form the basis of the study of the conquest. Though unsatisfactory in some ways, the first familiar statements of what happened come from them. The most important of these accounts are those of the *Cūlavaṃsa* and the *Pūjāvaliya*. The *Pūjāvaliya* account is of exceptional value as it was written within half a century after the invasion. The nature and value of these two accounts have formed the subject of a lengthy and critical discussion by A. Liyanagamage.[2] Suffice it to say here that much of these accounts is devoted to denouncing the wickedness of the invaders and bemoaning the damage done to the Buddhist order. Despite the bitter tone of the accounts, there is no doubt that they are based on genuine traditions as is confirmed by the archaeological evidence and by one of the Tamil chronicles,[3] and are very valuable to our study. Hence our account of the invasion and of the subsequent occupation of northern Ceylon is to be primarily based on these sources.

The *Cūlavaṃsa* account of the invasion begins with the following strophes:

> But since in consequence of the enormously accumulated, various evil deeds of the dwellers in Lanka, the *dēvatās* who were everywhere entrusted with the protection of Lanka, failed to carry out this protection, there landed a man who held to a false creed, whose heart rejoiced in bad statesmanship, who was a forest fire for the burning down of bushes in the forest of the good, – that is of generosity and the like – who was a sun whose action closed the rows of night lotus flowers – that is the good doctrine – and a moon for destroying the grace of the groups of the day lotuses – that is of peace – (a man) by name Māgha, an unjust king sprang from the

1 K. Indrapala, *Dravidian Settlements...*, p. 461; K. Indrapala, *Yāḻppāṇa Irāceiyattin Torram*, pp. 49—51 (Peradeniya 1971).
2 A. Liyanagamage, *op. cit.*, pp. 110 ff.
3 K. Indrapala, *Dravidian Settlements...*, p. 362.

Kaliṅga line, in whom reflection was fooled by his great delusion, landed as leader of four and twenty thousand warriors from the Kaliṅga country and conquered the island of Laṅkā.[1]

In these preliminary strophes we are told of the character and lineage of Māgha and of the numerical strength as well as the country of origin of the army he led. By describing Māgha as a man who held to a false faith, the author informs us that he was a non-Buddhist. This is confirmed by all the literary sources, including the Tamil *Maṭṭakkaḷappu-māṉmiyam.*[2] He is generally described here as a king of the Kaliṅga line. This is generally repeated in the other Pali and Sinhalese works and in the *Maṭṭakkaḷappu-māṉmiyam*. But it is contradicted in the *Cūḷavaṃsa* itself in another place where he is called a Damiḷa king.[3]

This is not the only instance of a statement in the above account being contradicted elsewhere in the *Cūḷavaṃsa*, as we shall see presently...

The statement in the *Cūḷavaṃsa* that Māgha's 'four and twenty thousand warriors' who are later described as forty-four thousand strong, both incredible numbers, came from Kaliṅga is not consistently maintained throughout the chronicle. Almost immediately after the strophes quoted above, there appears the following strophe :

...thus his great warriors oppressed the people,
boasting cruelly everywhere: 'We are Keraḷa warriors'...[4]

This contradicts the earlier statement that they came from Kaliṅga. This is not all. Again in strophe 70 of the same chapter they are referred to as 'Damiḷa warriors'.[5] In the whole *Cūḷavaṃsa* account, Māgha's soldiers are described in three places as Keraḷas,[6] in eight places as Damiḷas[7] and in one place as Keraḷas and Damiḷas (Kerala Damiḷa) [8] This confusion regarding the identity of Māgha and his

1 *Cv.*, 80:54—59.
2 *Mattakkalappu-Manmiyam*, ed. F.X.C. Nadarajah, p. 53 (Colombo 1962).
3 *Cv.*, 83:15.
4 *Ibid.*, 80:61.
5 *Ibid.*, 80:70.
6 *Ibid*, 80:61, 76: 81:3.
7 *Ibid.*, 80:70; 81:14; 82:6,26; 83:12,14,24; 87:25.
8 *Cv.*, 83:20.

soldiers is not confined to the *Cūlavaṃsa* alone. It is found to the same extent in the *Pūjāvaliya* as well. In fact, the account of Māgha's invasion and occupation in these two works are remarkably similar so much so that one is inclined to think that one is based on the other or that both are based on a common source. As the *Pūjāvaliya* is almost contemporaneous with the occupation of Māgha it is unlikely that this work is based on another source, unless we take the source to be monastic records. It seems likely that the *Cūlavaṃsa* account is based on that of the *Pūjāvaliya* or on the records used by the author of the latter work. The important point, however is that the discrepancies in the two works are identical. The *Pūjāvaliya*, too, calls Māgha a Kaliṅga king (Kalingu-raja) at first and Draviḍa king (Draviḍa-raja) and Tamil king (Demaḷa-raja) later on.[1] Similarly, his soldiers are called Malala (Keraḷa) at first, Demaḷa (Tamil) in several other places and Demaḷa and Malala (*Demaḷa Malala mahasenaga*) in one place.[2] That Parākramabāhu II, in his campaigns against Māgha, fought the Malalas and the Draviḍas (Tamils) is maintained not only in the *Pūjāvaliya* but also in other Sinhalese works such as the *Dambadeṅi-katikāvata*, *Nikāya-saṅgrahaya* and the *Saddharma-ratnākaraya*.[3] There are several ways of explaining this confusion in our sources. Firstly, when the author of the *Cūlavaṃsa* states that Māgha 'landed as leader of four and twenty-thousand warriors from the Kaliṅga country', he may be failing to be precise in his statement rather than making a factual mistake. For, it is possible that what the author is saying is that Māgha landed from the Kaliṅga country and conquered Laṅkā with twenty-four thousand soldiers, who may have been recruited in South India. This is quite probable for even on earlier occasions princes from Kaliṅga, like Anīkaṅga and Lokeśvara, captured the throne of Polonnaruva with the help of Tamil mercenaries from South India.[4] It is nowhere recorded that there were mercenaries from the Kaliṅga country in the island at this time. Secondly, it may be that Māgha's army consisted of Keraḷa and Damiḷa mercenaries who were already in Kaliṅga in search of

1 *Pūjāvaliya*, ed. A. V. Suravira, pp. 108, 114 and 116 (Colombo 1961').

2 *Ibid* , pp. 108 and 116.

3 *Ibid* , pp. 117—118; *Katikāvat-sangarā*, ed. D. B. Jayatilaka, p. 8 (Kelaniya 1955); *Saddharmā-ratnākaraya*, ed. K. Nanavimala Thera, p. 314 (Colombo 1948).

4 K. Indrapala, *Dravidian Settlements*..., p. 242; S. Wickramasinghe, 'Successoas of Parākramabāhu I. . .', p. 520.

employment or in the service of Māgha. This is not impossible for we know that in this period there were Kerala and Karnāṭa mercenaries in the employ of not only the Tamil kings of South India but also rulers in far-off places like Bengal.[1] The Manahali plate of Madanapāla, for instance, includes Karnāṭas and Choḍas among the mercenaries employed by the Pāla ruler in the twelfth century.[2] It is, therefore, possible that Māgha's Kerala mercenaries went to Ceylon from Kaliṅga itself But if we are to believe the Sinhalese and Pali chronicles that the army of Māgha was very large, then it is unlikely that all the soldiers came from far-off Kaliṅga and we may have to accept the first possibility, namely that Māgha recruited them, or at least most of them, in South India. The confusion between Damiḷas and Keraḷas also could be resolved without much difficulty. It has been suggested that the 'Damiḷa Keraḷa' of the *Cūlavaṃsa*, translated as Damiḷas and Keraḷas, should be rendered as Keraḷa Damiḷas, like Soḷī Demaḷun in Sinhalese meaning Coḷa Tamils.[3] The implication is that like the Cōḷas and the Pāṇḍyas the Keraḷas were also treated as Damiḷas and, therefore, there is actually no discrepancy in the *Cūlavaṃsa* account regarding the identity of Māgha's soldiers. Though this is a plausible explanation, it appears that Māgha's army did not consist of only Keraḷas but also Damiḷas. Perhaps at the beginning there were many Keraḷas but once Māgha had established himself at Polonnaruva, more soldiers would have been recruited from among the Tamils who were resident in the northern parts of the island. This perhaps is the reason why both the *Pūjāvaliya* and *Cūlavaṃsa* refer to them as Keraḷas and Damiḷas. There seems to have been several South Indian leaders who were united under Māgha and led different contingents of mercenaries.[4] This may be the reason why the *Hatthavanagalla-vihāra-vaṃsa* states that there were 'many thousands of enemy forces with their kings, the Coḷas, Keraḷas and the like, who had destroyed the world and the *sāsana* and were living in Pulasthipura',[5] The statement that there were forty-four thousand

1 K. Indrapala, *Dravidian Settlements...*, p. 174; *Annual Report on Epigraphy for 1909*, (Madras), No. 315 of 1909.

2 D. C. Sircar, 'Karnata outside Karnata', *J. N. Banerjea Volume*, p. 211 (Calcutta 1960).

3 A. Liyanagamage, *op. cit.*, p. 106, fn. 2.

4 K. Indrapala, *Dravidian Settlements...*, pp. 338—339.

5 *Hatthavanagalla-vihāravamsa*, ed. C. E. Godakumbure, p. 32 (PTS, London 1956).

Keralas and Damilas at the time of their final debacle as opposed to the twenty-four thousand at the time of the invasion also seems to support the view that more Damilas swelled the ranks of the invaders after their initial victories.[1] In this period, the invaders from Kaliṅga and the Malay Peninsula appear to have solved the problem of transporting soldiers from their home countries by hiring mercenaries from the near-by Tamil and Kerala countries. Once they landed in the island they may have enlisted further mercenaries resident there. Paranavitana's contention that Māgha's soldiers were Malays does not seem to be convincing.[2] It is rather difficult to accept that an army that wrought much destruction and held forth in a number of fortresses in the northern parts of the island consisted entirely of soldiers from the far-off Malay Peninsula. While the *Cūlavaṃsa* specifically mentions that there were Jāvakas in the army of the Malay invader Candrabhāṇu, who invaded the island in the middle of the thirteenth century, there is no mention of Jāvakas in connection with Māgha.[3] There is little doubt that Māgha depended on South Indian mercenaries for his success.

The invasion of Māgha, though in many ways similar to the earlier invasions of the island, stands out prominently in respect of the results it produced. As in the case of the earlier invasions, there was much destruction wrought in the Rājaraṭṭha, especially in the capital city. The account of the *Cūlavaṃsa* and the *Pūjāvaliya* may be somewhat exaggerated but there is no gainsaying the fact that destruction was caused by the armies of Māgha. Even in the Tamil traditions this aspect of Māgha's rule has been preserved. In the *Maṭṭakkalappu-māṇmiyam* it is explicitly stated that Mākōṉ (Māgha) 'caused all the Buddhist *vihāras* and Buddhist temples at Tōppāvai (Polonnaruva) to be destroyed and sought all the Buddhist monks and imprisoned them'.[4] But unlike in the time of the earlier invasions, this time there seems to have been much appropriation of land and property by the invaders. They are stated to have taken away all the possessions of rich people.[5] It is claimed that 'villages and fields,

1 *Cv.*, 80:59; 83:20.
2 S. Paranavitana, *Ceylon and Malaysia*, pp. 85 ff. (Colombo 1967).
3 *Cv.*, 83:36, 37.
4 *Mattakkalappu-manmiyam*, p. 53. '*Toppavaiyil ulla putta vikarai puttalayankal ellam itippittu putta kurukkalai ellam tēti pitittu ciraippatutti vaittu*'.
5 *Cv.*, 80:64.

houses and gardens, slaves, cattle, buffaloes and whatever else belonged to the Sihaḷas he (Māgha) had delivered up to the Keraḷas'.[1] Even in the Māyāraṭṭha, Damiḷa warriors, 'dwelt as they pleased in the single villages and houses.'[2] Thus, the soldiers of Māgha appear to have seized villages, fields and houses in the Rājaraṭṭha and the Māyāraṭṭha. We may make an allowance for possible exaggeration but we cannot reject these statements wholly. These allegations are made in the *Pūjāvaliya* as well and repeated in most other works.[3] Considering the fact that the northern regions of the island slipped away from the hands of the Sinhalese with the conquest of Māgha and the fact that the slow migration of the Sinhalese people from the Rājaraṭṭha to the south-western parts started around this time, we cannot rule out the possibility of confiscation of lands by the invaders. The migration of the Sinhalese population, or the bulk of it, from the Rājaraṭṭha to the south-western region of the island has formed the subject of much study by scholars.[4] It is generally agreed that the weakness of the successors of Parākramabāhu I, the incessant invasions of the island and the consequent breakdown of the administrative machinery which was so vital for the upkeep of the irrigation system were among the more important causes for the abandonment of the Rājaraṭṭha in the thirteenth century. While it is true that the breakdown of the administrative system was greatly responsible for the abandonment of the Rājaraṭṭha, one cannot underestimate the importance of the foreign invasions, especially that of Māgha. This latter factor was in some ways responsible for the breakdown of the administrative system as well as for the shift of Sinhalese power to the south-west. It is important to note that the severity of the rule of Māgha and the confiscation of lands by the Keraḷa-Damiḷa warriors would certainly have led to the flight of the official class, which more than any other factor is held to have been the cause of the breakdown of the irrigation system and the subsequent abandonment and depopulation of the Rājaraṭṭha. The fact that even after Polonnaruva was regained by the Sinhalese the seat of government was not shifted to the Rājaraṭṭha shows that conditions were

1 *Cv.*, 70: 86
2 *Ibid.* 81:14
3 *Pūjāvaliya*, pp. 108—109.
4 The other articles in this symposium.

not quite normal in that region. The breakdown of the administrative machinery was not the only reason for this. More important than this is the fact that the enemy had not been quite got rid of. On earlier occasions when the capital city was regained from the invaders, they were completely ousted from the island. But in this instance the enemy had only been driven further north. Moreover, new enemies, namely the Jāvakas, appeared on the scene and took the place of the earlier enemy. After the Jāvakas, the Pāṇḍya feudatories, called the Āryacakravartis, took their place. Thus, there was a succession of enemies in northern Ceylon and neither Polonnaruva nor any other place in the Rājaraṭṭha was quite safe for re-occupation. This factor, as much as the breakdown of the administrative machinery, was responsible for the depopulation of the Rājaraṭṭha and the failure to shift the Sinhalese seat of government there. Not only the Sinhalese but even the Tamils found the Rājaraṭṭha unsafe. Whereas in the case of the Sinhalese the fertile regions of the south-west afforded new homes, the arid peninsula of Jaffna became the seat of Tamil power and provided homes for many of the new settlers from South India. Why was it that the new dynasty chose the arid peninsula in the northern region of the island which had neither irrigation works worthy of the name nor sufficient rainfall to enable easy cultivation? Compared with that peninsula, the north-central parts of the island lying north of Polonnaruva, even after the breakdown of the irrigation system, would have been a better place. These regions were never completely abandoned by either the Sinhalese or the Tamils. We shall see in the sequel that small numbers of Sinhalese and Tamils continued to live in those areas under the rule of petty chieftains called Vannis or Vanniyar,[1] who changed alliance between the Tamil ruler of northern Ceylon and the Sinhalese ruler of the south, according to the political climate of the times. We shall also see later that the occurrence of a large number of Tamil toponyms in places which had Sinhalese names in the period before the thirteenth century certainly suggests that the area was occupied by Tamils and that the majority of the Sinhalese people of these regions were either

1 K. Indrapala, *Dravidian Settlements...*, pp. 306—340; this section of the thesis is now published, K. Indrapala, 'The Origin of the Tamil Vanni Chieftaincies of Ceylon'. *The Ceylon Journal of the Humanities*, I, No. 2, July 1970, pp. 111—140 (Peradeniya).

ousted by or, less probably, assimilated to the Tamil population.[1] Even in many areas where Sinhalese re-occupation took place and where Sinhalese live at present, Tamil place-names occur in considerable numbers, thereby showing that such areas were settled by Tamils at the time of the Sinhalese re-occupation. The area lying between the Jaffna kingdom and the Māyāraṭṭha, generally known as the Vanni from the thirteenth century until recent times, appears to have formed some sort of a buffer between the warring Sinhalese and Tamil kingdoms. The rulers of the two kingdoms appear to have found it more convenient to leave this area under the rule of petty chiefs who owed nominal alleigance to either of them. The northern and eastern parts of the Vanni were in the hands of the Tamil chiefs while the southern parts bordering on the Sinhalese kingdom proper were in the hands of the Sinhalese. It is, therefore, necessary to appreciate the significance of the Tamil occupation in the abandonment of the Rājaraṭṭha by the Sinhalese. It appears that already in the eleventh and twelfth centuries the Sinhalese were being slowly pushed out of the northern regions where Tamil settlements were numerous, especially from the north-western littoral.[2] This process was, therefore, expedited by the ruthless occupation of Māgha and his troops in the thirteenth century. Our literary sources attribute the cause of Sinhalese migrations from the Rājaraṭṭha at this time solely to the foreign occupation. We get the following statement in the *Cūlavaṃsa* on this point :

> During this alien rule several virtuous people had founded on divers of the most inaccessible mountains a charming town (or) a village and dwelling here and there protected the laity and the Order so that they were in peace.[3]

After this some of these new towns and villages are enumerated.[4] An echo of the *Cūlavaṃsa* statement is found in the *Hatthavanagalla-vihāra-vaṃsa*, where it is said that when the enemy forces oppressed them, the ministers and such other important personages and the people left their villages and their townships in thousands in search

1 K. Indrapala, *Dravidian Settlements...*, pp. 357—359.
2 *Cv.*, 81:1—2.
3 *Ibid*, 81:3—9.
4 *Hatthavanagalla-vihāravaṃsa*, p. 30.

of places of protection in the rocky mountains and forest strongholds.[1] Of those who remained behind, many came under the rule of the new Vanni chieftains.

The permanent dislodgement of Sinhalese power from the Rājaraṭṭha, the confiscation of lands and properties by the Keraḷa and Damiḷa soldiers and the consequent migration of the official class and several common people to the south-west were among the more important results of the invasion and occupation of Māgha. These directly helped the transformation of the northern and eastern parts of the island into areas predominantly settled by Tamils. The invasion of Māgha may, therefore, be considered to be the most important factor that helped the establishment of more Tamil settlements in the island in the thirteenth century.

After the invasion of Māgha and before the rise of a dynasty from the Tamil country in northern Ceylon at the turn of the thirteenth century, there were more than five foreign invasions of the island. All except one were undertaken with the help of South Indian troops, thus bringing in more South Indians to the island. The first of these was the invasion of the Jāvaka ruler Candrabhānu in 1247.[2] This expedition of the Jāvaka ruler was undertaken with Jāvaka troops from his kingdom, according to the *Cūlavaṃsa* and the *Pūjāvaliya*.[3] The next invasion was that of Jaṭāvarman Sundara Pāṇḍya - some time before 1258. This does not find mention in the *Cūlavaṃsa* but some inscriptions of Sundara Pāṇḍya dating from 1258 claim that he exacted tribute from the Ceylonese ruler.[4] A second Pāṇḍya invasion appears to have taken place in or about 1262. This too, is not mentioned in the *Cūlavaṃsa* and is known to us only from the inscriptions of Jaṭāvarman Vīra Pāṇḍya I (acc. 1253).[5] About the same time, the Jāvaka ruler Candrabhānu led a second invasion of the Sinhalese kingdom, on this occasion with the help of 'many Damiḷa soldiers,

1 S. Paranavitana, 'The Dambadeni Dynasty', *UCHC*, I, Pt. 2, pp. 622—625; A. Liyanagamage, *op. cit.*, pp. 133—140.

2 *Cv.*, 83:36—37; *Pūjāvaliya*, p. 117.

3 *Annual Report on Epigraphy for 1894*, (Madras), Inscription No. 106 of 1894; K. A. Nilakanta Sastri, *The Pandyan Kingdom*, p. 162. (London 1929).

4 *Annual Report on Epigraphy for 1917*, (Madras) Inscription No. 588 of 1916; K. A. Nilakanta Sastri, *The Pandyan Kingdom*, p. 176.

5 *Cv.*, 88:62—63.

representing a great force' whom he recruited in the 'countries of the Paṇḍus and Coḷas and elsewhere.'[1] It has been claimed that the second Pāṇḍya invasion was undertaken to help the Sinhalese ruler combat the forces of Candrabhānu.[2] After 1263 there appears to have occurred a few minor invasions of the island under the leadership of Pāṇḍya feudatories like Kāliṅgarāyar and Coḷagaṅgadeva. These are referred to in the *Cūlavaṃsa* as having taken place immediately before the accession of Bhuvanaikabāhu I (A. D. 1271).[3] In Paranavitana's opinion, 'all these events appear to have happened soon after the accession of Māravarman Kulaśekhara Pāṇḍya' (A.D. 1268).[4] The next invasion was led by the Pāṇḍya feudatory named Āryaccakkaravartti (Āryacakravartin) about 1284.[5]

It would be an oversimplification to suggest that the foreign invasions were solely responsible for the dislocation of the administrative machinery which in turn led to the breakdown of the economic system and the final abandonment of the Rājaraṭṭha. There were, of course, several factors that led to this end. An attempt has been made in this paper to illustrate the role of one of the more important factors – the invasions from South India. Besides these invasions there was one from South-east Asia, namely that of Candrabhānu. Never before in the recorded history of the island had so many important foreign invasions taken place within a short span nine decades. These had their many effects on the ancient Sinhalese kingdom. And these contributed in no small way to the dislocation of the administrative machinery, the breakdown of the reservoir system and the consequent economic decline. But these processes were not over in a few years. The foreign invaders left Polonnaruva in a few years. But still the Sinhalese princes, though they very much desired to, were unable to re-establish their authority at Polonnaruva. Had they been successful

1 S. Paranavitana, 'The Dambadeni Dynasty', p. 621.

2 *Cv.*, 90:32.

3 K. A. Nilakanta Sastri, 'Inroads by Pandya and Vijayanagara Empires', *UCHC*, I, Pt 2, p. 685.

4 *Cv.*, 90:44.

[Abbreviations: *Cv.*, *Cūlavamsa*, ed. Wilhelm Geiger, 2 vols., PTS, London 1925, 1927; *EZ–Epigraphia Zeylanica* (Colombo); *JCBRAS – The Journal of the Ceylon Branch of the Royal Asiatic Society* (Colombo); *UCHC* – University of Ceylon *History of Ceylon*, I, Ed. – in – Chief H. C. Ray, 2 parts (Colombo 1959 & 1960).]

in this attempt, the situation might have been saved to some extent or the evil day postponed. The city was obviously not disease-stricken or depopulated, for, had it been so, the Sinhalese princes would not have been dreaming of returning to Polonnaruva. The conclusion seems irresistible that what prevented them from achieving this was the presence of the foreign invaders in the northern parts of the island, not far from Polonnaruva. Herein lies the chief difference between the earlier invaders and the invaders in the thirteenth century. When the former were defeated by the Sinhalese princes, they left the island and allowed the Sinhalese to reconstruct. But the invaders in the thirteenth century, even when they suffered defeat at the hands of the Sinhalese, did not leave the island and their presence rendered any reconstruction impossible. What was dislocated in the period of the invasions continued to disintegrate. Economic decline was left unarrested and the Rājaraṭṭha gradually became depopulated.

7

THE DECAY OF THE DRY ZONE RESERVOIR SYSTEM OF ANCIENT CEYLON*

W. I. SIRIWEERA

The causes for the abandonment of the dry zone Rajarata as the centre of political, cultural and economic activity by the Sinhalese in or around the thirteenth century have been differently explained by a number of scholars.[1] Among these explanations, Rhoads Murphey's view that the collapse of the elaborate social and administrative

* From W. I. Siriweera, *Economic Conditions in Ceylon* c. 1070 – 1344. Thesis submitted to the University of London (Ph. D., 1970. Unpublished), pp. 160–65, This section of the thesis was revised by the author before inclusion in this symposium.

1 J. E. Tennent, *Ceylon*, London, 1859, pp. 424 – 25; Lucius Nicholls, "Malaria and the Lost Cities of Ceylon", *The Indian Medical Gazette*, Vol. LVI, No. 4, 1921, reprint; R. L. Brohier, *Ancient Irrigation Works of Ceylon*, Vol. I, Colombo 1934, p. 3; Brohier, *The Tamankaduwa District and the Elahera Minneriya Canal*, Colombo, 1941, p. 2ff; R. H. Spencer – Shrader, "The Secrets of the Tanks" *Loris*, Colombo, III, No. 6, 1945, pp. 215 - 18; IV, No. 1, 1945, pp. 291 - 292; H. Thirlaway, "Ruhuna and Soil Conservation", *Loris*, III, No. 6, 1945, pp. 210 - 14; E. K. Cook, "A Note on Irrigation in Ceylon", *Geography*, XXV, 1950, pp. 77 - 85; Report of the United Kingdom and Australian Mission on the Rice Production in Ceylon, 1954, *Sessional Paper* 2, Colombo, 1955, p. 33; B. H. Farmer, *Pioneer Peasant Colonization in Ceylon*, Oxford, 1957, pp. 167; Rhoads Murphey, "The Ruin of Ancient Ceylon", *Journal of Asian Studies*, XVI, No. 2, 1957; pp. 181 - 200; H. W. Codrington, "The Decline of the Mediaeval Sinhalese Kingdom, *JRASCB*, VII, n. s., 1960, pp. 93 - 103; S. Paranavitana, *University of Ceylon History of Ceylon*, I, part II, Colombo, 1960, pp. 713 – 19; A. Liyanagamage, *The Decline of Polonnaruwa and the Rise of Dambadeniya*, Colombo, 1968, pp. 68 – 75.

organization that was necessary for the construction and maintenance of the complicated irrigation system,[1] stands out as the most acceptable. Paranavitana and Amaradasa Liyanagamage have elaborated on the theme of Rhoads Murphey, citing examples from various indigenous sources;[2] but they have overlooked certain factors that led to the disappearance of the old order from Rajarata and have overestimated the significance of some factors that really did not contribute to the ultimate dislocation of the administrative and social organization of that region.

In explaining the circumstances of Māgha's invasion and its effects, Paranavitana states that the Sinhalese nobility known as the *kulīnas* suffered to the utmost extent during the regime of the invader. He further states that some of these *kulīnas* escaped to areas in which Māgha did not have any control. In his opinion "The peasants as a whole had been accustomed for centuries to obey the *kulīnas* who had the specialised knowledge and experience that were required to run the public administration, including the maintenance of irrigation works. Deprived of their guidance, and the force that is always necessary to make the average man act for the common good, the peasants no doubt neglected their traditional obligations towards the state"[3]

The term *kulīna* has been loosely used by Paranavitana and only in one instance does he attempt to define this term. There, he states that *kulīnas* were probably the same as the *Govikula*.[4] If this interpretation is correct, peasants or agriculturists who were "guided by *kulīnas*" did not belong to the *Govikula* and it is difficult to support this explanation with available evidence. The *Jātaka Aṭuvā Gāṭapadaya* written in the twelfth century, indicates that agriculturists were primarily of the *Govikula*[5], even though vocational specialization on the basis of caste did not preclude non-*Govi* castes from taking to agriculture as a supplementary or an alternative means of livelihood. This text gives the term *Govikula*, as the equivalent of the Pali term *Kassakakula* which

1 Rhoads Murphey, *op. cit.*
2 Paranavitana, *op. cit.*; A. Liyanagamage, *op. cit.*
3 Paranavitana, *op. cit.*, pp. 715-16.
4 Paranavitana, *op. cit.*, p. 560
5 *Jātaka Aṭuvā Gāṭapadaya*, edited by D. B. Jayatilaka, Colombo, 1943, p. 130.

means cultivators' caste.[1] The term *kulīna* literally conveys the meaning people of 'high caste' or good family[2] and could mean not only those of the *Govikula*, but also those belonging to superior castes in the hierarchy.[3] All *kulīnas* were not necessarily involved in the administration of the kingdom, though those in the higher rungs of the administrative structure were recruited from among the *kulīnas*.

Moreover, the elaborate administrative organization, suggested by the *Kandavuru Sirita* and *Dambadeni Asna*[4] does not indicate that the early kings of Dambadeni who fought against Māgha lacked the support of *Kulīnas* or more precisely that of the officials with administrative experience and knowledge. Paranavitana states in a different context that "The administrative and political organisation of the Sinhalese under the first rulers of Dambadeni must, ... have been the same as in the Polonnaru period."[5]

Paranavitana's explanation for the failure of the attempts to establish the Sinhalese administrative organization at Polonnaruva is that there were very few who had actual experience of its working after the persecution of Māgha.[6] This does not seem to be a plausible contention. It is recorded that several capable dignitaries of Rajaraṭa who resented Māgha, left that region and established independent principalities in Rōhana and Malaya. Thus, the Sēnāpati Subha established himself in independent authority at Yāpavu. The Ādipāda Bhuvanekabāhu, established himself on the summit of the Gōvindamala mountain and held sway over the province of Rohana. The Sēnāpati Sankha established a settlement on the mountain of Gangadoni in the district of Manimēkhala. Vijayabāhu who attained the status of a *vannirāja*, also began to organize an army against Māgha.[7] These

1 *Jātaka Aṭuvā Gātapadaya*, *op. cit.*, p. 130
2 For classical examples see; *Dahamsa-ana*, edited by Dhammananda thera, Colombo, 1929, p. 140.
3 As the sources for a study of the caste system of this period is limited it is difficult to determine the exact or even the approximate place of each caste in the heirarchical system.
4 "Kandavuru Sirita", *Sinhala Sāhitya Lipi*, edited by D. B. Jayatilaka, Maharagama, 1956; *Dambadeni Asna*, edited by D. D. Ranasingha, Colombo, 1928.
5 Paranavitana, *op. cit.*, p. 726.
6 *Ibid.*, p. 718.
7 *Cv.*, LXXXI, 1—13.

dignitaries must have had the support of several Sinhalese officers who left Rajaraṭa to avoid being under Māgha and of some in Rajaraṭa who unwillingly accepted the authority of Māgha through fear.

If the *Pūjāvaliya* is to be believed, Māgha ruled over certain parts of Rajaraṭa for forty years,[1] and about two centuries before Māgha, the Chōlas ruled the northern part of the island for a longer period than Māgha. The Chōlas like Māgha adopted in Ceylon a policy that was intolerent. The Sinhalese nobility suffered at their hands as well. The *Cūlavaṃsa* states that they (the *Cholas*) violently destroyed all the monasteries "like blood sucking Yakkhas" and "took all the treasures of Lanka for themselves."[2] When Vijayabāhu I(1055-1111), who defeated the Chōlas, ascended the throne in Rajaraṭa in 1070A.D. he found many reservoirs and canals breached and neglected [3] This implies that the Chōlas did not properly maintain the net-work of reservoirs in Rajaraṭa. The officialdom of the Sinhalese kingdom on the eve of the Chōla occupation may not have been greatly different from that in existence at the time of Māgha's invasion. However, after the Chōlas were vanquished, the Sinhalese succeeded in re-establishing their social order and the administrative machinery in Rajaraṭa but they seemed to have failed in a similar task after the defeat of Māgha towards the middle of the thirteenth century. Instead, the Sinhalese nobility who organized themselves under Vijayabāhu III (1232-36) and Parākramabāhu II (1236-70) against Māgha, moved their capital to the south western regions after only a brief stay in the more northern parts of Rajaraṭa. As suggested previously, their administration in the new capital, Dambadeniya, implies that they were men of administrative capability, and it seems that there is no valid ground to suggest that the suppression of the Sinhalese feudal nobility, or *kulīnas* as Paranavitana sometimes calls them, at the hands of Māgha, contributed to the permanent dislocation of the social and administrative organization in Rajaraṭa. Paranavitana himself has stated that during the regime of Māgha, "Those who migrated from the Rajaraṭa to other districts must have been mainly the people of high birth and their immediate retainers."[4] The question one has to answer is why they

1 *Pūjāvaliya*, edited by Ratmalane Dhammananda, Colombo 1924, p. 693.
2 *Cv.* LV, 2I—22.
3 *Cv.* LX, 48—51.
4 Paranavitana, *op. cit.* p. 718.

made no significant attempts to re-occupy Rajaraṭa after Māgha's expulsion.

Paranavitana having discussed the drain on man power and material resources during the Chōla conquest in the early eleventh century and in the subsequent campaigns that led to the restoration of Sinhalese sovereignty, in the struggle of Parākramabāhu to gain supremacy over the island and in the prolonged foreign wars of the same king,[1] states that "the manhood left to propagate the race must have been not the fittest and most vigorous, and their progeny in the subsequent generations did not possess the necessary stamina of mind and body to cope with difficult situations that they were faced with, both in struggling against adverse natural forces and in resisting the onslaughts of enemies from abroad."[2] Liyanagamage, too, devoting attention to the drain on human and material resources, suggests that Parākramabāhu's expeditions abroad hastened the decline of the Polonnaru kingdom.[3] Rhoads Murphey also hints that the policies of Parākramabāhu I may have contributed to the sudden and complete collapse which followed his death.[4]

The weakening of the Polonnaruva kingdom due to these factors would certainly have helped Māgha to establish his authority in Rajaraṭa, but once Māgha's strong hand was removed, the Sinhalese did not successfully re-occupy Rajaraṭa and maintain the reservoir system and magnificent buildings erected by their ancestors. The drain on manpower and material resources after all, is not a completely new phenomenon that is to be seen in the time of the Polonnaruva kingdom. Moreover, it is difficult to accept the view that the contribution of these factors for the weakening of the Sinhalese kingdom during the time of the late Polonnaruva kings had been much greater than previously. Human and material resources would have been weakened in the wars like those fought between Elāra and Duṭugämunu in the early days of the Anurādhapura kingdom. In the battle of Moggalāna I (491–508 A.D.) against Kassapa, many thousand lives must have been lost. He is also said to have killed more than a

1 Paranavitana, *op. cit.*, pp. 716—17.
2 *Ibid.*, p. 717.
3 A. Liyanagamage, *op. cit.*, p. 71.
4 Rhoads Murphey, *op. cit.*, p. 196.

thousand dignitaries after he established his authority at Rajaraṭa.[1] In the 225 years of civil disputes between Lambakaṇṇas and Moriyas from Dhatusena (455-73 A.D.) to Mānavamma (684-718) economic resources would have been spent on wars. Mercenaries were brought from India by certain Sinhalese princes such as Moggallāna I (491-508), Agbo III (629-639), Dhāṭhōpatissa I (639-650), Dhātopatissa II (659-667) and Mānavamma (684-718) in order to seize the throne of Ceylon. Vast sums of material resources would have been utilised to make payments to these mercenaries. During the time of Sena I (833-853) the Pāṇḍyas invaded Ceylon under Sri Māra Srī Vallabha and subsequently Sena II (853-887) helped a rival faction of the invader in Southern India to oust him from the throne. Such involvements would also have resulted in heavy expenditure. On the eve of the Chola occupation of the island, the Sinhalese king's treasury was so poor that King Mahinda V (acc. 982) could not pay the wages of Sinhalese as well as foreign soldiers.[2] These circumstances contributed to the decline of the Anurādhapura kingdom and the northern parts of the island became an easy prey to the Chōlas. Likewise, the conditions that Paranavitana and Liyanagamage describe contributed to the decline of the Polonnaruva kingdom and made it possible for Māgha to occupy Rajaraṭa. But once the Cholas were vanquished, the Sinhalese kings re-established their authority in Rajaraṭa, repaired old reservoirs and constructed new ones, built large edifices and brought back prosperity to these areas, whereas after the discomfiture of Māgha similar developments did not take place. Thus, the causes for the decline of Rajaraṭa civilization and the abandonment of Rajaraṭa have to be sought elsewhere.

Both Paranavitana and Liyanagamage believe that excessive centralization of administration under Parākramabāhu I contributed towards the rapid decline of Rajaraṭa civilization following the death of that ruler.[3] In the words of Paranavitana,

> After that monarch (Parākramabāhu I) had made himself the master of the island, one hears no more of the princes of the

1 *Cv.*, XXXIX, 34-36

2 *Cv.*, LV, 4-5.

3 Paranavitana, *op.cit.*; pp. 716-17; Liyanagamage, *op.cit.*, pp. 71-72.

Dakkhiṇadesa or of Rohaṇa. All state affairs were directed by the king in person from Polonnaru, and the autonomy of the Māyaraṭa and Rohaṇa was a thing of the past. No edicts issued by the *Māyā* of the Dakkhiṇadesa, or by the *āpā* of Rohaṇa are known in the Polonnaru period. This concentration of the administrative departments no doubt contributed towards efficiency so long as there was a strong ruler at the centre to direct affairs, and the state was powerful enough to defend itself against aggression from without or to deal with internal discord. But once the strong guiding hand was removed and the city capital sacked by invaders, (Māgha) the administrative machinery would have been dislocated with the loss of the archives and the dispersal or death of the bureaucrats. And there was no alternative organization in the provinces from where the administrative system could be re-introduced.[1]

It is true that after the reigns of Parākramabāhu and Niśśaṅkamalla, central authority weakened and it is also justifiable to assume that as a result Rohaṇa became an independent principality. This was the pattern of history from the early period of the Anurādhapura kingdom. Paranavitana himself states that the tradition of administrative organization was there among the Sinhalese even at the time of Māgha's occupation of Rajaraṭa.[2] Vijayabāhu III organized human and material resources in Māyāraṭa to fight against Māgha. His son Parākramabāhu II continued Vijayabāhu's work and an administrative net-work was established in Māyāraṭa under him. In fact after the expulsion of Māgha, these rulers tried to re-establish their authority in Polonnaruva and renovate buildings and reservoirs around that city and Anurādhapura. But instead of establishing their capital at Polonnaruva they rushed to Dambadeniya and ruled from there.

Thus, it seems that the illustrations of Paranavitana and Liyanagamage do not explain several crucial questions: Why was the Sinhalese administrative organization not re-established in Polonnaruva. why did the reservoir system and magnificent buildings in the heart of Rajaraṭa fall into a state of dilapidation in and after the thirteenth

1 Paranavitana, *op.cit.*, p. 717.

2 *Ibid.*, p. 716.

century, why did the collapse of social and administrative machinery of Rajaraṭa come at this particular period of history and not in an earlier period of the history of Ceylon, etc.?

The answers to these questions could be found, perhaps through a brief survey of the political conditions of the country for about two or three centuries from the time of the invasion of Māgha. As in the time of the Chōla occupation of Rajaraṭa, irrigation system must have suffered neglect under Māgha. Even before Māgha the Sinhalese rulers after Niśśaṅkamalla, who were pre-occupied with internecine wars appear to have paid little attention to irrigation. The conditions prevalent after Māgha, aggravated the neglect of the reservoir system and its inter-connected canals. Chandrabhānu, who invaded Ceylon towards the end of Māgha's reign, conquered some of the regions that were held by Māgha. Subsequently, he established his authority in certain parts of north Ceylon with the help of the troops he brought from South India. Around 1258 A. D. the Pāṇḍyan king Jaṭāvarman Sundara Pāṇḍya appears to have attacked him and levied tribute. But when Chandrabhānu had established himself firmly in north Ceylon he defied the Pāṇḍyas and as a result in 1263 Jaṭāvarman Vīrapāṇḍya invaded his kingdom, killed him and placed a son of Chandrabhānu, who accepted the authority of the Pāṇḍyas on the throne of the northern kingdom. Thus, the Pāṇḍyas established their power in north Ceylon. This was the beginning of the Tamil kingdom of Jaffna and it ushered in an era of the history of the island which centred round two kingdoms. One of these, the Sinhalese kingdom controlled the southern and central parts of the island, the other, the Tamil kingdom of Jaffna, dominated the north. Except for a brief period of seventeen years (1450 - 67) under Parākramabāhu VI the country was not united till the British brought territorial unity in 1815 A. D. Neither the Tamil rulers nor the Sinhalese kings who lived in relative isolation in the fourteenth and fifteenth centuries could establish their capital in the heart of Rajaraṭa and rule from there as there was an equally powerful kingdom close by. The Sinhalese, in fact, retreated farther and farther into places in the hills of the wet zone. The only king who ruled at least for a short time at Polonnaru after Māgha, was Parākramabāhu III (1287-93) who seems to have been a vassal of the Pāṇḍyas.

The rest of the Sinhalese kings as well as the Tamil rulers probably treated the area around Anurādhapura and Polonnaruva, as

a buffer region between the two kingdoms.[1] This would have resulted in the dislocation of the administrative and social organi zation in these areas. Due to the lack of a strong political centre in Rajaraṭa, communication and contacts with other areas declined. The settlements became isolated and isolation paved the way for stagnation. The local chieftains named *Vannīs* exercised their authority over these isolated settlements. These chieftains theoretically acknowledged the overlordship of either the Tamil kings or the Sinhalese kings, but except in one or two rare instances,[2] for all practical purposes they were independent. They had their own armies and administered their small principalities without interference from the two main kingdoms. The village folk who survived in the isolated settlements in Rajaraṭa managed the irrigation works and cultivated their paddy fields. But neither they nor the disunited Vanni chieftains who were scattered all over the dry zone could successfully organize the labour force required to maintain the reservoir system and its closely interconnected canal system, which only an efficiently organised state and society could command. When the chain system of anicuts, channels and reservoirs was neglected the ruin was speedy and inevitable.

The complete breakdown of the dry zone reservoir system and the decline of the Rajaraṭa civilization was a long process. For instance, the great reservoir at Kavudulla seems only to have been breached about 1680 A. D.[3] Sir Emerson Tennent who visited the Minneri tank in 1848 has stated that at the time of his visit the embankments

1 Even during the time of the Portuguese and the Dutch occupation of the coastal areas of the island, the central parts of the former Rajaraṭa was a buffer region between the territories of the Portuguese and the Dutch and the territories of the Kandyan kings.

2 Vijayabāhu III and Parākramabāhu II are said to have subjugated Vanni chieftains but it is difficult to determine whether they brought the Vanni chiefs completely under control. The only Sinhalese king who seems to have successfully won the allegiance of the Vannis was Parākramabāhu VI, but with his death they became independent. Varodaya Cinkaiyariyan, the Aryachakravarti of the Jaffna kingdom who ruled in the middle of the 14th century also may have subjugated Vanni chiefs before he attacked the Gampola kingdom. However, there is no concrete evidence for this view.

3 R. L. Brohier, *Tamankaduwa District and the Elahera - Minneriya Canal*, Colombo, 1941, p. 8.

of this reservoir remained nearly perfect although overgrown with lofty trees[1]. Nobody is certain about the date when the process of decay was completed but clear signs of the decline were to be seen towards the end of the thirteenth century. In the subsequent centuries, deep in jungle solitudes the remains of the proud cities of Anurādhapura and Polonnaruva and the gigantic reservoirs around them stood in ruin, a ready prey to the jungle growth which encroached upon them.*

1 Emerson Tennent, *op. cit.*, p. 600.

* The author wishes to acknowledge his debt to Mr. W. J. F. Labrooy for his encouragement and suggestions and to Drs. V. Kanapathipillai, V. K. Samaraweera, K. Malalgoda and S. Pathmanathan for their assistance.

8

THE RUIN OF ANCIENT CEYLON AND THE DRIFT TO THE SOUTH - WEST*

MICHAEL ROBERTS

I

The abandonment of the ancient civilization — a "hydraulic society" — which flourished in the Dry Zone of Ceylon from the latter half of the first millenium B. C. to the thirteenth century and the subsequent shift of the centres of population and administration to the Wet Zone in the south-western portions of the island have given rise to much speculation. Summarising and synthesizing what has been written on the subject so far, the following explanation can be provided: The foreign and civil wars which plagued the country, particularly during the period extending from the eleventh to the thirteenth centuries, contributed substantially to the decline by decimating the population, by weakening the institutional fabric of society and by reducing the power of the ruling class — the "feudal nobility" of Ancient Ceylon; and in the latter connection Paranavitana stresses that it was the deliberate policy of the invader Magha in the thirteenth

* Reprinted from *The Ceylon Journal of the Humanities*, Vol. II, No. 1, Jan. 1971 (forthcoming).

century to weaken and destroy the old aristocracy.[1] This set of factors was not solely responsible for the decline of Ceylon's hydraulic society. Resulting in part from the military strife of the Polonnaruva Period and the decline of the ruling class under the impact of Magha's invasion, and in part from the absence of a strong guiding hand after Parakarmabahu I had centralised the prevailing structure to a greater degree than before, and possibly because Parakramabahu had overexpended the resources of the society, there was a decay of the institutional machinery, a disintegration of the elaborate social and administrative organisation which had created and supported the hydraulic system of Ceylon.[2] Thirdly, the spread of malaria probably contributed to the depopulation of the area.[3] Paranavitana believes it to be a moot point whether malaria was the cause or the consequence of decline.[4] But Rhoads Murphey is undoubtedly the more correct in the emphasis he attaches to this factor. The story of Rohana in the south-eastern portions of the island is perhaps illustrative of its significance. To judge by the same criterion that is applied to the rest of the Dry Zone, namely, the evidence of tanks, canals and other ruins, Rohana was probably as

1 S. Paranavitana in *History of Ceylon*, Vol. I, Pt. 2, Colombo, Ceylon University Press, 1960, pp. 714-18.
Rhoads Murphey, "The Ruin of Ancient Ceylon", *The Journal of Asian Studies* Vol. 16, no. 2, February 1957, pp. 189 & 195-96.
B. H. Farmer, *Pioneer Peasant Colonization in Ceylon*, London, O.U.P.. 1957, p. 16.
R. L. Brohier, *Ancient Irrigation Works in Ceylon*, Ceylon Govt Press, 1934, vol. 1, pp. 1-2.
H. W. Codrington, *Journal of the Ceylon Branch of the Royal Asiatic Society*, New Series, Vol. VII, Part I, 1960, pp. 93-103.

2 Paranavitana, pp. 715-17; Farmer, 1957, p. 17; Murphey, 1957, pp. 193-97. Murphey overplays his assessment of the bureaucracy in treating it as a 'powerful, ramified" body and stretches a point in treating the society as a Wittfogelian despotism. Leach has indicated many of the weaknesses in this comparison but himself errs in underestimating the degree of the kings' authority and overestimating the power and freedom of the local chieftains; while it is correct to stress the decentralized nature of the administration, Leach forgets that the kings controlled large extents of land for which they used officials and that there existed such central departments as the *dolos-maha-vatan* which supervised hydraulic works. See E. R. Leach "Hydraulic Society in Ceylon," *Past & Present*, no. 15, April 1959 and *History of Ceylon*, Vol. 1, Pt. 1, Colombo, Ceylon University Press, 1959 pp. 359-61, 529-44 & 553.

3 Murphey, 1957, pp. 198-99; Farmer, 1957, p. 17.

4 Paranavitana, p. 715.

densely peopled as Rajarata.[1] Except for one or two incursions it was not subject to foreign invasions. To be sure, it was involved in the series of civil wars that occurred in the eleventh and twelvth centuries and Parakramabahu I conducted a major campaign in order to restore his control in Rohana. But it probably did not suffer from the ravages of war to the same degree as Rajarata. Ergo, the organisational fabric would have suffered less. Why then, as on several other occasions in previous history, did not Rohana serve as a remnant political bastion for the Sinhalese and a mainspring of recovery? Rhoads Murphey has brought to our attention the fact that a note on an early Portuguese map dated circa 1606 states that Rohana was depopulated by "sickness" three hundred years earlier.[2] The answer to our question therefore lies in this "sickness", probably malaria, and suggests that malaria was of general significance as a causal factor in the ruin of Ancient Ceylon.

A fourth influence, that of salinity, cannot altogether be discounted. In a dry climate high rates of evaporation and inadequate drainage can leave stranded salts and alkalines, which then contribute towards exhaustion of the soil. Examining this possibility, however, Rhoads Murphey concludes:

> Apparently it has never happened in Ceylon except for small local patches, despite the shallowness of the soil and the nearness of bedrock to the surface. Where irrigation water brought salts or alkalines, the soils were kept flushed by the heavy seasonal rains and by the slight but adequate slope.[3]

Rudolph Wikkramatileke, on the other hand, states that the salts liberated during the rainy season become concentrated on the surface in dry periods and result "in the formation of impoverished *damana* lands, i. e. areas of alkali soils" - a tendency that was allegedly

1 Rudolph Wikkramatileke, *Southeast Ceylon: Trends and Problems in Agricultural Settlement*, Dept. of Geography Research Paper No. 83, University of Chicago, 1963, p. 55.

2 Murphey, 1957, p. 199. See E. Reimers, *Constantine de Sa's Maps and Plans of Ceylon*, Colombo, 1929, p. v.

3 Murphey, 1957, p. 190.

furthered by deep ploughing and irrigation.[1] He also noted that "extensive *damanas* are found in uninhabited forest areas of the Dry Zone".[2] It is necessary, in the first place, to set right this conflict in the assessment of the contemporary picture. The *damanas*, or poor savannah, tend to be invaded by grasses, especially the *imperata cylindrica* or *illuk* in Sinhalese, which create definite limitations on settlement. But *damanas* are found today only in patches and that too as a serious problem only in regions east of the Mahaweli river (therefore not in Rajarata proper); and *illuk* is a scourge that "does not frequent paddy lands, being killed by flooding"[3]. At worst, as Farmer notes, *damanas* could only have contributed towards limited regional depopulation. Nor is it certain that *damanas* developed during the high noon of Ancient Ceylon. They may well be a more recent man-made problem. In fact, writing in the 1880's the forester F. D' A. Vincent placed the responsibility squarely on the shoulders of the cultivators (many of them Muslims) of the Eastern Provinces. It would seem that they did not respect the cycle of swidden agriculture (the *chena* cycle) and let the cleared patches of land lie fallow for a number of years, but cultivated a series of crops over a period of eighteen months so that "the soil was so thoroughly exhausted that even the usual chena scrub refused to grow" and only *illuk* prospered.[4]

These processes were not the only means by which salinity could be disseminated and nourished, however. It has been suggested that the water stored in the tanks themselves became increasingly saline.[5] Among the "three independent aspects or functions of irrigation" is that it fertilizes the paddy field, nourishing it through the transportation

1 Wikkramatileke, 1963, pp. 48–49. Elsewhere he writes: "Continued cropping on Dry Zone soils under irrigation, especially without the use of organic manure, often leads to the formation of *damana* areas of unproductive alkali soils on which even normal forest regrowth is retarded." (p. 57).

2 *Ibid*, p. 57.

3 Farmer, pp. 17, 31–32, & 235–36.

4 *Sessional Paper XLIII of 1882*, Forest Administration of Ceylon, by F. D'A. Vincent, p. 12. For what really happens under excessive swidden culture, see pp. 11–12 in the body of this essay.

5 For instance, in conversation, by Professor Terrence Seneviratne of the Faculty of Agriculture, University of Ceylon.

of nutrients to it [1] Under the generally poor soil conditions of the Dry Zone, this fuction is (and would have been) of particular importance. A substantial increase of salinity in the tank water would presumably retard this function, and even reverse it, thereby affecting yields. This possibility has not been taken into account by Murphey and needs scientific investigation.

There is yet another sphere that beckons further investigation. It is possible that *chena* cultivation, a form of swidden agriculture or shifting cultivation, was of greater significance in sustaining the population than has hitherto been recognised. What would such a state of affairs imply vis-a-vis our field of study? Contrary to popular opinion over the years in elitist circles, swidden agriculture does not *necessarily* lead to exhaustion of the soil. In the generally thin and poor soils of the tropics plant life draws its nutrients as much or more from the nutrients locked up in living forms (that is, the biotic community) as from nutrients stored in the physical substratum, the soil. In other words, "the tropical-forest ecosystem... circumvents the problem of impoverished soil conditions by feeding largely upon itself". "Swidden agriculture operates in essentially this same supernatant, plant-to-plant, direct cycling manner... A significant proportion of the mineral energy upon which the swidden cultivates, and especially the grains, draw for their growth comes from the ash remains of the fired forest, rather than from the soil as such..."[2] A *chena* plot is not abandoned because the soil has lost its fertility. It is left (a) because there is inadequate plant cover to provide the ash to fertilise a new cycle of crops and (b) because of very rapid weed growth.[3] It has to be left fallow for a period of years (varying from 8 to 25 years according to climate and soil) before

1 Clifford Geertz, *Agricultural Involution: The Processes of Ecological Change in Indonesia*, Berkeley & Los Angeles, University of California Press, 1966, p. 43.

2 Geertz, 1966, pp. 20-21, Geertz (pp. 15-28) provides a brilliant consolidation and elucidation of the most pertinent writing on the subject of swidden agriculture. Also see the essays by Herold C. Conklin, E. R. Leach and Karl. J Pelzer presented before the *Proceedings of the Ninth Pacific Science Congress of the Pacific Science Association*, Bangkok, 1957; William L, Thomas (ed.), *Man's Role in Changing the Face of the Earth*, University of Chicago Press, 1956; and Farmer, 1957, pp. 47-50.

3 Geertz, 1966, pp. 22-24; Farmer, 1957, p. 48; and A. W. R. Joachim and S. Kandiah, "The Effect of Shifting (*Chena*) Cultivation and Subsequent Regeneration on Soil Composition and Structure", *Tropical Agriculturist*, vol. civ, 1948.

it is worthwhile cultivating it again, that is, before there is adequate forest or plant cover to provide enough ash for the cultivation of food crops. With reference to the Dry Zone, in fact, Farmer has stated that

> the chena system is a wise concession to the nature of the region, and in particular to the difficulty of growing annual crops in perpetuity where periodical soil regeneration is essential because of erodible soils, significant slopes, high temperatures, and seasonally heavy rainfall; and to the difficulty, in view of the behaviour of soil moisture, of establishing on high land ecologically sound and economically useful tree crops such as are grown in the *gangoda*.[1]

Nevertheless, swidden cultivation rests on a delicate equilibrium. "Given less than ideal conditions, it is highly susceptible to breakdown into an irreversible process of ecological deterioration", wherein one finds a succession of the notorious *imperata* savannah grass rather than a recuperation of the forest. As Geertz notes,

> Swidden cultivation may turn thus maladaptive in at least three ways: by an increase in population which causes old plots to be recultivated too soon; by prodigal or inept agricultural practices which sacrifice future prospects to present convenience; and by an extension into an insufficiently humid environment in which the more deciduous forests have a much slower recovery rate and in which clearing fires are likely to burn off accidentally great stands of timber.[2]

These dangers are of some significance to the Dry Zone of Ceylon because it is semi-arid and has forests of mixed evergreen and deciduous composition. In general, it is probable that a much lengthier chena cycle is needed in Ceylon than in most of the wetter, more humid areas where

1 Farmer, 1957, p. 50, *Gangoda* refers to the 'village place' i. e. the immediate surroundings of the village settlement.

2 Geertz, 1966, pp. 25-26. D'A. Vincent's complaint provides an example of prodigality.

swidden agriculture prevails.[1] The possibility exists, therefore, that the population in Ancient Ceylon began to press on the land available for *chena* cultivation and that this would be of general significance *if* chena crops provided a substantial proportion of the food. The answer to such a question must however be in the negative. The land area of the Dry Zone is approximately 18,000 square miles and the population of Ancient Ceylon has been conjecturally estimated as between two and four million, with 90% in the Dry Zone.[2] A host of factors suggests that there was an abundance of forest and other land.[3] The population is not likely to have endangered the chena cycle needed to maintain an equilibrium.

But another sideroad remains. It has been estimated that in some areas the yield per labour inputs from swidden cultivation is greater than similar yield from wet rice or other perennial forms of cultivation[4]. *If* such be the case for the Dry Zone of Ceylon — and I am not in a position to give a verdict on this point — it could have had significant implications for the history of Ancient Ceylon. Where political events or a series of natural calamities affected the wet rice cultivation of a village or a locality, and resulted in damage to its hydraulic works, what would the inhabitants do? They would either migrate, or resort to *chena* cultivation — probably the latter. In a cultural milieu which probably valued leisure, would they continue to rely on a form of culture which was more lucrative in terms of the return per labour expended, and which was perhaps even more secure in its returns than wet rice culture based solely on a village tank? Would the inhabitants continue to depend on their chenas rather than to invest their labour in resuscitating their hydraulic works? Here too the answer must be the negative. The repairing of village tanks did not call for large-scale

1. Significantly only one or two successions of crops are generally harvested under chena cultivation in Ceylon, whereas many of the examples from more humid areas which scholars have reported on reveal that a plot was utilised successively more often, with three years being the maximum safe limit. See Colin Clark and Margaret Haswell, *The Economics of Subsistence Agriculture*, Macmillan & Co., 1967, ch. 2.
2 Murphey, 1957, p. 186.
3 See Michael Roberts, "The Hydraulic Society of Ancient Ceylon: Speculations on the Factors Contributing Towards the Relative Stasis in its Socio-economic Structure", paper read at the 28th International Congress of Orientalists, Canberra, January 1971.
4 Clark & Haswell, 1967, pp. 35-36.

labour inputs. And for such a process to serve as a general cause for decline, it had to be widespread. The periodic restoration of large tanks and of some of the hydraulic complexes (which fed a significant proportion of the village tanks) by the Sinhalese monarchs indicate that such a process could not have gone very far. At best, it would have served as a supplementary factor in subsequent centuries after the deterioration in Ceylon's hydraulic society had already set in.

Once the major forces delineated earlier had eroded the foundations of society, nature began to overwhelm and dominate man. As Rhoads Murphey has noted, in the Dry Zone "weeds cover an untended field in a matter of weeks; in six months scrub growth has taken over, and in a few years great trees growing out of tank or channel bunds weaken them against the next heavy rains". Persistent cattle and elephant tracks also could weaken bunds. The seasonal rains themselves serve as "potential destroyers" and periodic floods create great havoc.[1] These influences, however, must have gained momentum in a secondary, subsequent, and therefore, contributory capacity. They were not novel features. The Sinhalese had held them in check perviously. The decline of the hydraulic society merely helped such phenomena to perpetuate the decline.

Reference should also be made to the process of decline. Did the population of the Dry Zone migrate in large numbers to the South-West? Or did they steadily dwindle while the settlements existing in the South-West expanded? Paranavitana contends that "the characteristic attachment of the peasant to the plot of land that he and his forefathers had been cultivating must have made him remain in his village" and that "those who migrated from the Rajarata to other districts must have been mainly the people of high birth and their immediate retainers".[2] The preliminary statement is a piece of retrospective romanticism. Peasant societies have, not uncommonly, been featured by mass flights or intraregional migrations.[3] In the face of a scourge such as malaria, it is unlikely that the majority of

1 Murphey, 1957, pp. 188 & 197.
2 Paranavitana, pp. 718–19.
3 For istance see any detailed history of eighteenth or nineteenth century Russia; or Irfan Habib, *The Agrarian System of Mughal India (1556–1707)*, Madras, Asia Publishing House, 1963, chap. ix.

Sinhalese peasantry stood their ground, particularly when there was a haven near at hand.

II

In the literature surveying the decay of Ancient Ceylon, all the factors and forces which have been stressed fall into a broad category: namely, influences which generated an exodus or led to a deterioration in the political and administrative attention paid to the Dry Zone. One therefore comes across such phrases as "forced them into the wet zone".[1] In other words, they are all "push factors".

There is, however, another type of influence which has been neglected and which is the main justification for this essay: namely, the haven provided by the Wet Zone and the potentialities it held out, potentialities which led the populace (and its leaders) to concentrate their attention on the South-West rather than to attempt a recovery of the civilization in the Dry Zone.

The South-West was peopled from early times, despite the thick rainforest which must have clothed it. Several inscriptions in the Brāhmī script dating up to the first century B. C. indicate that the early settlers had spread beyond the Dry Zone to the lowlands of Colombo and Kāgalla districts (then referred to as the kingdom of Kalyāṇī or Kālaṇi) as well as the lower montane zone around Kandy and Gampola and Badulla. Thereafter, there is a thousand year hiatus in the epigraphical records till the tenth century A. D. On this evidence Paranavitana suggests that there was an exodus of a large section of the population from the Wet Zone settlements to the Dry Zone. As this apparent exodus "coincides with the beginning...of organised development of the dry zone under irrigation of progressively increasing magnitude", he conjectures that the expansion of irrigation works may have induced migration or even led the kings to forcibly transfer the population to satisfy their labour requirements[2]. However, hydraulic works of a larger scale were only launched in the latter-half of the first century A. D., under Vasabha (67–111). And they were merely first steps in the advance from village tank to major tanks. Six of the eleven tanks alleged to have been built by Vasabha have been

1 Murphey, 1957, p. 183.
2 *History of Ceylon*, Vol. 1, Pt. 1, pp. 221–22.

identified. None of them were major works by later standards.[1] It was largely during the reign of Mahasena (275-301) and subsequently in the fifth, sixth and seventh centuries that large-scale and complex hydraulic schemes were established.[2] It is doubtful therefore whether one should make much of the coincidence which Paranavitana has highlighted.

The important point, however, is that the South-West appears to have been hardly peopled from the first century A. D. to the tenth century A. D. Small settlements may have persisted along the coast; and the montane regions bordering on the Dry Zone certainly had some inhabitants while Malayarata (the mountane regions in the centre of Ceylon) as a whole served as a refuge for political refugees. By and large, however, the tropical forest and its beasts reigned supreme.

This meant that during any setback in the civilization of the Dry Zone within the first millenium A. D., the Sinhalese people and their leaders had no alternative but to try and construct anew whatever they had lost. A large-scale movement to the Wet Zone implied the rapid conquest of the tropical rainforest at a time when their resources would have been below normal. The generations that lived through the troubled times of the thirteenth and fourteenth centuries did not face this problem. Substantial areas of the Wet Zone had already been peopled.

The process by which the Wet Zone was settled between the ninth and thirteenth centuries has not received detailed treatment as yet. It is not known whether the expansion of the nuclear settlements within the Wet Zone, or the penetration and expansion of the Dry Zone population provided the larger component in this change. It is conjecturally probable the latter was the more dominant factor, and that it involved a southward movement from Rajarata (particularly the sub-district of Dakkhinadesa) as well as a nor' by nor' west movement from Rohana. Evidence from the ninth and tenth centuries shows

1 *Ibid*, p. 222.

2 *Ibid*, pp. 222-23, 352-55. For the manner in which these works helped to extend the authority of the king see Lakshman S. Perera, "Proprietary and Tenurial Rights in Ancient Ceylon", *The Ceylon Journal of Historical & Social Studies*, Vol. 2, no. 1, January 1959, espe. p. 32.

that the heir-apparent to the kingdom of Rajarata, called *mahapā*, *mahaya* or *māyā*, was placed in charge of Dakkhina Desa to the south-West of Rajarata.[1] Dakkhina Desa came to be known as Mayarata and appears to have absorbed the age-old settlements around Kalyani. It is also possible that the conquest of Rajarata by the Cola Empire in the year 1017 led some of the population, particularly those within the modern Kurunegala and Nuwarakalawiya districts, to migrate southwards. Nor must we lose sight of the possibility that technological developments contributed to this overflow into the South-West of Ceylon. In the story of Man the earliest developed agricultural societies were created in semi-arid areas and the forest line of humid forest areas was not beaten back till iron came into widespread use. In the Indian sub-continent that occurred during the first half of the first millennium B. C.[2] Iron technology had reached Ceylon at a very early date.[3] It therefore does not serve as a satisfactory explanation for the expansion of settlements at such a late date, though the possibility should be examined that the more widespread use of iron enabled peasant cultivators to achieve such an expansion without inspiration from the political regime.[4] Again, attention should be devoted to the influence of the coconut palm (and the extension of its culture) in assisting the population to move to the lowlands of the South-West.

Be that as it may, the conquest and settlement of the Wet Zone paved the way for later generations when they were propelled out of the Dry Zone by the constellation of factors noticed earlier in this essay. By the thirteenth century, any group of villagers balancing the choice between an attempt to resuscitate their *gama* (village) in the Dry Zone and a fresh life in the South-West would have had much reason to opt for the latter. The decline of Ancient Ceylon, or "the drift to the South-West" as it has sometimes been called, was not merely a story of its occupants being pushed out of the Dry Zone. It was a "push-pull" process.

1 *History of Ceylon*, Vol. 1 pt. 1 pp. 365-66.
2 Irfan Habib, "An Examination of Wittfogel's Theory of 'Oriental Despotism', in *Studies in Asian History: Proceedings of the Asian History Congress 1961*, Indian Council of Cultural Relations, New Delhi, Asia Publishing House, 1969, pp. 382-83.
3 *History of Ceylon*, Vol. 1, Pt. 1, p. 78
4 Habib (1969, p. 383) quotes Gordon Childe as having noted that iron "democratised agriculture...once any peasant could afford an iron axe to clear fresh land for himself".

A SELECTION OF EXTRACTS FROM OTHER WRITINGS ON THE SUBJECT

Fernao de Queyroz: *Civil War and Disease*

"...But as all human prosperity has its limits, and great riches become an incentive to great vices, when this City and Kingdom was most prosperous, then were they ruined entirely, there preceeding (sic) a protracted civil war followed by a contagion of smallpox, where it attacks the same person two or three times.

There was added to this a lack of provisions and an invasion of poisonous rats, and by these scourges the greater part of the people of that City perished in punishment, as they confess, of the unspeakable crime, introduced doubtless by the dealings with the foreigners, Chinese, Arabs, and Romans; among the Chingalas nor among the Heathen of this Further India is there any sign of such a turpitude being familiar to them. The king Vatimi Boneca Bau also died after a reign of 30 years. And as he had no sons, he was succeeded by his brother Sedenia Bau, who, to escape this contagion, went with his Court to the place Damba Dini Bandar in the country of Calu-gambala Corla..... .

The Common people, who were not able to follow the Court, either remained in the town of Anu-Raja-pure, or fleeing from those calamities, betook themselves to the forests in those mountains..."

(*The Temporal and Spiritual Conquest of Ceylon*. Bk. I, tr. S. G. Perera (Colombo 1930), pp. 15-16. The original Portuguese work was completed in 1687).

John Still: *Wars, the Breakdown of the Irrigation-system and Malaria*

"...it might be said without injustice that civil war was the rule rather than the exception after the termination of any long and successful reign. When a prince was defeated he fled to India, where he had relatives, and there either awaited another chance of recovering his lost position or raised an army of mercenaries, whom he bribed with promises of loot, and invaded the kingdom he aspired to govern.

"This is where the importance of the tank system comes to be linked with the history of Lanka's decline and fall. Possibly the Sinhalese may have respected the channels so long as their wars were strictly among themselves, but when Indian mercenaries came in, led by some Cholan or Pandiyan chief who had heard of the wealth of the temples and monasteries of a creed alien to him, naturally they cared but to injure their opponents as quickly and as thoroughly as they could.

"The records are written by monks who knew little of the tactics of war and did not describe them, but they did not spare their bitter complaints of the looting and destruction of the monasteries; and from the enormous repairs found necessary after each period of civil war, and recorded in the list of each great reforming king's deeds as second, in the eyes of the monk historians, to his pious gifts to monasteries, we can tell that tanks and channels suffered terrible damage in war. Their bunds must have been cut as an ordinary tactic, or as a reprisal, frequently, and with disastrous results. Anuradhapura, the old capital, derived its water supply from the enormous tank Kalawewa, distant by channel more than fifty miles from the town. Into one large tank that spread for more than six hundred acres against the western quarter of the town, the water from Kalawewa first ran; then from that to another smaller tank, but yet nearly a mile across, in the middle of the city, right among the monasteries and temples; and from that again to smaller tanks and ponds and pools for bathing, for washing clothes, for drinking, or for growing lotus blooms. The very life of the city was bound up with this supply of water brought from so far away, so what could be easier and more effective than to cut the channel somewhere along its serpentine course of three-and-fifty miles? Modern soldiers would not hesitate to do so, and we have no reason to suppose that those of ancient times were more merciful, or less sagacious. In the result fields would be thrown out of cultivation, and standing crops ruined; clean running water, not only throughout the city but over wide areas, would dry rapidly under the tropical sun into a string of pools; millions of small fishes would be left to perish of drought, and millions more would be captured by birds where they still fought for life in water all too shallow for them; and mosquitoes would multiply at an appalling rate.

"The best way to combat malaria is to drain pools where the larvae of the anopheles mosquitoes can live, and the second best way, where for some reason the pools cannot be drained or filled in, is to introduce small fish, who, multiplying quickly, feed upon the larvae and control them, preventing their increase. War among the tanks reversed both these beneficial measures rapidly and completely, and we cannot doubt that war was almost certainly followed by an epidemic of malaria. That is why the Sinhalese eventually became too enfeebled to keep up the mighty works their ancestors had built, for doctors can measure, almost with precision, the percentage of energy that is lost by malarial infection.

"It explains, too, why the map made by the malariologist should so closely follow the map that might be made of the known inscriptions and ruined sites.

"It explains why the jungle tide has risen and submerged that ancient kingdom so completely."

(*The Jungle Tide*, (1955 ed. London), pp. 90-93, First ed. 1930.)

Arnold J. Toynbee: *Stoppage of human exertions after incessant warfare*

"At various times and places, recalcitrant Nature, once broken in by human heroism, has broken loose again because later generations have ceased for some reason to keep up the constant exertions required of them in order to maintain the mastery which had been won for them and transmitted to them by the pioneers. In such cases of reversion, the primeval state of Nature, as it was before Man ever took it in hand, can be seen to-day...

"...the equally arduous feat of conquering the parched plains of Ceylon for agriculture is commemorated in the breached bunds and overgrown floors of the tanks which were once constructed on the wet side of the hill country, on a colossal scale, by the Sinhalese converts to the Indic religion of the Hinayana.

".. the missionaries of the Indic Civilization in Ceylon once achieved the *tour de force* of compelling the monsoon-smitten highlands - where 'rain pours down at a higher rate for the month than the rainfall of London for the whole of a very wet year' - to give water and life and wealth to the plains which Nature had condemned to lie parched and desolate.

"...The arduousness of the labour of first conquering and then holding for a man-made civilization these naturally barren and desolate plains is demonstrated by the two outstanding features in the landscape of Ceylon at the present day. The first feature is the relapse of that once irrigated and cultivated and populated country-side into its primeval barrenness and desolation upon the stoppage of the continuous human exertions which had been required in order to produce and maintain this miraculous transformation of the face of Nature...

"The cause of the breakdown of the ancient Sinhalese irrigation system was an incessant civil war which was waged with alien mercenaries from Southern India. These mercenaries deliberately cut the canals and breached the bunds as a short cut to military decisions; and eventually this will to destroy overcame the will to repair. Therewith, the plains not only went out of cultivation through the stoppage of the water-supply, but they also became hot-beds of malaria when the running waters dwindled into stagnant pools which were too shallow to harbour the fish that live by eating up the anopheles mosquito's larvae."

(*A Study of History*, Vol. II (4th ed. London 1948), pp. 3, 5, 6 and 6 fn. 1. First ed. 1934).

"(*In the Babylonic Civilization*) It is manifest that in the fourth century B. C., as in the sixth and seventh and thirteenth centuries of the Christian Era, the physical failure of Man to maintain over Nature the command which Man had once imposed upon her was the consequence and not the cause of Man's social failure to manage his relations with his human neighbour.

"We arrive at a similar conclusion when we follow out a train of investigation which is suggested by a remarkable finding of empirical observation in Ceylon. In Ceylon at the present day the area which contains the ruined monuments of the Indic Civilization on the island has been found to be coincident, not only with the area that is permanently afflicted by drought (in contrast to that part of the island that is annually drenched by the monsoon), but also with the area that is infested nowadays with malaria This latter-day perversity of a water-supply which is amply sufficient nowadays for breeding the Anopheles Mosquito, while it is wholly inadequate for raising crops,

is at first sight a strange environmental setting for the social life of the civilization whose former establishment in precisely this area is attested beyond all question by the archaeological evidence..... In Ceylon the immigrant Indic Civilization was stimulated to its highest achievements in an area where it could not maintain itself at all without creating and keeping up a vast and elaborate system of water-storage and irrigation. We have still to explain why the area which, in virtue of these mighty works, was once covered by irrigated fields, has now become a hot-bed of malaria besides going out of cultivation.

"It is extremely unlikely, *a priori*, that the malaria should have been prevalent already at the time when the mental and physical energy that went into these gigantic waterworks was being put forth by the human occupants of the country; and, as a matter of fact, it can be demonstrated that the malaria is a consequence of the ruin of the irrigation-system and is therefore posterior to the age in which the Indic Civilization in Ceylon was in its flower This part of Ceylon became malarious because the breakown of the irrigation-system transformed flowing watercourses into chains of stagnant pools and destroyed the fish which had lived in those flowing waters and kept them clear of mosquito-grubs. Thus in tracing the cause of the decline and fall of the Indic Civilization in Ceylon, we have come upon a technical factor, the ruin of the irrigation-system a factor which operated both directly, by disastrously reducing the possibilities of cultivation, and indirectly by turning the lees of the once life-giving waters into breeding-places for an insidious disease. We have still, however, to trace the cause of of this technical catastrophe. What was it that choked the irrigation-channels and breached the bunds of the tanks? When we put this question, we find that the cause was not any decline in engineering technique but the social decline which is the very phenomenon for which we are seeking to account.

"Those bunds were breached and those channels were choked in the course of an incessant and devastating warfare. The works were deliberately sabotaged by invaders as a short cut to the military objective of bringing their victims to their knees; and a warworn people had not the heart to go on repairing a damage that had been inflicted so many times over and that was virtually certain to be inflicted many times again. On this showing, the ultimate

explanation of the decline and fall of the Indic Civilization has to be sought in a social cause - the social malady of warfare - and this social malady, which is the key to the problem, proves to have been itself the cause and not the consequence of the loss of command over the physical environment which is implied in the ruin of the irrigation - system. Thus, upon investigation, the technical factor dwindles, in this case again, into an incidental and subordinate link in a chain of social cause and effect which has still to be traced back to its social origins."

(*A Study of History*, Vol. IV (4th ed. London 1948), pp. 45-47. First ed. 1939.)

S. Vere Pearson: *Wars and Malaria*

"Wars affect population in various ways - always adversely. Even when war spreads disease the effects come about in a variety of different ways, and this is so in regard to the disease malaria.

"The history of Ceylon in ancient times, under its Sinhalese kings, is mainly a chronicle of royal crimes, virtues and delinquencies; of the long drawn out struggle with invading princes and armies from Southern India; and of internecine strife...

"Not only did people suffer directly but also through interference as an ordinary tactic of warfare, with the wonderful irrigation system which had been built up. The tanks and channels suffered much damage.

"Now to understand how these things led to widespread malaria and permanent depopulation it is necessary to enter into some of the details of the life of the malarial parasite and of its other host the anopheles mosqito, and to learn the connection between these things and irrigation. It used to be some twenty years ago that ague (an old fashioned name for malaria) was kept down by dealing with stagnant pools of water where the anopheles larvae throve and that the main thing to do was to drain swamps and pour oil on the surface of the pools. But in more recent times it has been discovered that matters are not so simple as this. There are dangerous species of mosquitoes in some districts which thrive in clear, slowly running water. Dirty water is bad for

them. Hence mining operations, or the muddying of water through agricultural cultivation, through washing clothes, through refuse, or through the action of domestic animals, diminish malaria. Again, the action of shade over the water is of importance, and the presence of fish in certain circumstances. A good system of irrigation means tanks well filled with fish. It means clean channels along which the water can run briskly. That means no weeds or grass in the water on which the anopheles larvae can hang and thrive. It also means inhabitants to cultivate the fields irrigated and render much of the shallowest water muddy. The fish in the tanks provide a protein diet to supplement the rice of the natives to keep them vigorous and healthy. Also the small fish feed upon the larvae of the mosquitoes and keep them down. The dangerous species of mosquito are found in the cultivated regions below the reservoirs, especially now that human beings dwell there in too small numbers to stir up and use the water. It is true that one authority, Dr. Lucius Nicholls, believes *Anopheles minimus* (a large group of mosquitoes mostly malaria carriers) must have been a new importation into Ceylon and that this explains a change from prosperity and dense population to an ague-devastated sparse one. But Sir Malcolm Watson, after years of study in Malaya, Assam, and Ceylon, does not agree with this view. He considers that this species never got a chance until there were not enough people to dirty the war, and that this state of affairs was brought about through war. As long as there was a population surplus to the water and the water was thereby muddied, then there was no malaria. As long as conditions were normal there was never a water supply surplus to the population. People did not trouble to build a dam before it was wanted. But wars came and upset everything. Human beings were slain, or driven out, or taken away to fight in foreign parts, and the dangerous species of mosqito established themselves. Malaria found a foothold.

"...The tank age endured for centuries. But wars and ague laid waste. The people perished. Poverty and depopulation became permanent."

('Man and Mosquito in Ceylon', *Discovery* (London), Vol. XVI No. 181, Jan. 1935, pp. 11-13).

H. I. S. Thirlaway: *Soil Erosion*

"The history of man is, in reality, the story of the soil upon which he lives. There was no great civilisation before man ceased to hunt for his food and began also to grow it. The roots of civilisation are grounded deeply in the soil. The old civilisations of W. China, Persia, Mesopotamia and N. Africa were great because of their fine agricultural organization. They remained great so long as their soil retained its fertility. Unfortunately these civilisations were not sufficiently conscious of the factors of their environment. The soil was quite unwittingly exploited; the Hwang-Ho, Euphrates, Tigres, and Nile swept away the infertile pulverised soil; agriculture, the foundation of the Nation's Power, failed; the countries weakened, became prey to the watchful barbarians, and are now deserts or semi-deserts. This too is the story of the Great Ancient Sinhalese civilisation. In 390 B. C. the present N. Dry Zone was rich agricultural territory. The records of the "glorious Kingdom of Lanka" are well known. By 500 A. D. the country was being devastated by war. The fall of Lanka is the all too familiar story of failure of agriculture, primarily due to soil erosion. Lanka's agricultural organization (one of the most efficient of its kind) failed because the tanks essential to the irrigation of the farms, became silted up; the soil, rendered infertile by intensive farming, was swept away in sheets; gullies impossible to cultivate spread over the country. The more the Sinhalese expanded, the more ground was brought under the ubiquitous plough and the faster the soil was washed from the fields into the tanks, rivers, and sea. Finally the people reached the hills, felled the forests, ploughed the grass, and thereafter accelerated erosion. That was the end. The civil wars, Tamil wars, the breaking of the bunds and malaria, the accredited reasons for the decline of this era, all resulted from the rape of the soil".

('Ruhuna and Soil Conservation', *Loris*, A Journal of Ceylon Wild Life, Vol. IV, No. 6, June 1945, pp. 210–211 (Colombo))

R. H. Spencer-Schrader : *Deforestation and Soil Erosion*

"The ancient tanks and irrigation channels of Ceylon have long been accepted as proof of productivity and prosperity and have been responsible for the legend that this country was "The

Granary of the East". It is the truth, however, that far from being a sign of prosperity, the tanks marked the beginning of decadence.

" ....

The shifting cultivation employed by the early Aryans necessitated the deforestation of the country. It is now known that deforestation is one of the best ways of encouraging soil erosion. As the forest disappeared, one can visualise the gradual loss of the fertile soil which was washed, during the copious North-East Monsoon rains, from the high lands into the hollows and streams. The sand began to choke the river beds and the sub-soil, always impermeable, became exposed when the soil went, and refused to absorb the rain that fell. The underground springs and reservoirs, which became depleted and could not be fed, receded, and conditions became favourable for drought in spite of an abundant rainfall.

"These things do not happen in a day; they begin imperceptibly, but continue, unless checked, with an ever increasing rate of acceleration, and their cumulative effects are disastrous.

"There is a hint that things were beginning to go wrong with the soil in the reign of Amandagamani (79-89 A.D.) when it was recorded for the first time that a king interested himself in food production.....

"Thirty-eight years after Amandagamani, in 127 A. D. Vasabha became king, and it is from now onwards that one reads of tanks and other irrigation works in profusion, all constructed with one end in view, the production of food. .....

"With the death of Mahasena in 362 A. D. the Great Dynasty ended. The Rajavaliya records the reasons for both the end of the Dynasty and the subsequent abandonment of the Capital. Two of them are: 'Because Anuradhapura declines for want of meritorious personages; and *because the produce of agriculture and horticulture is failing*'. The accumulated effects of a bad system of agriculture had resulted in inevitable disaster.

"The Dry Zone, as anyone who has been there knows, is undulating, and in some places, steep. There are shallow valleys that connect with the streams and there are hollows without any outlet. Indiscriminate deforestation removes from the soil its protective cover; during the torrential rains of the North-East Monsoon erosion takes place, and the fertile layer of soil at the top is carried away bodily by the water which is not held until it sinks into the ground. If the soil laden water flowed into a valley connected with a stream, the heavier particles would be deposited on the bed, raising and eventually choking the stream; in this way floods, causing serious damage, result. The lighter particles, which alone contain the elements of fertility, are finally carried into the wasting sea. If on the other hand, the soil laden water flowed into hollows from which there was no outlet, it would stand until it was either absorbed by the land or evaporatep by the sun.

"Two important factors must be borne in mind. When silt is deposited the finer particles choke the capillaries and, at first, retard and, later, prevent percolation. The result is that the water, containing many salts in solution, stands on the surface until it is evaporated, and does not connect with the soil water. There is, therefore, no movement that would cause a distribution of the salts in such a way that fertility is not impaired. In the course of time, a crust of salt is formed, rendering the land unfit for any sort of cultivation. The phenomenon is not unknown in the Dry Zone, where there are places where salt in crystal form has been found on the surface of the land.

"The second factor is that after the top soil has been transported bodily, the water will begin to carry away the sub-soil, and fertile soil in the low lands may be overlaid by a layer of infertile sub-soil. This phenomenon was common when clean weeding was the vogue on many estates, and owners of paddy fields claimed for damage done by silting.

"After the fertile soil has been into the hollows from the high lands, the latter will become unproductive, while the growing of crops would be possible in the hollows, many of which are irrigable. The history is convincing that, shortly before the produce of agriculture and horticulture failed, this was the position in the Dry Zone, and salvation was sought in the extended use of irrigation. But the hollows, owing to

exhaustion, to the formation of salt or to a cover of infertile sub-soil in turn ceased to be productive.

"Fertile hollow after fertile hollow was sought, tanks and irrigation channels were constructed, and water carried along these to make the land fruitful. As fertility disappeared, the tanks, channels and fields were abandoned, and new tracts exploited, There can be no other explanation of the facts as recorded in the history of the country between 483 B. C and 1186 A. D. The high lands first ceased to be productive; then came the tanks in a series of barriers, as it were, each barrier intended to stem the ebbing tide of productivity. The tide, however, ebbed in spite of the barriers, and that part of the country in which the early colonists had chosen to settle, fertile and well watered as it undoubtedly had been, was abandoned a few years after Parakrama Bahu had, as he thought, saved the people of this country for ever from starvation. The Dry Zone had become arid and desolate as we know it today.

"It is highly probable that the influx of eroded material into the rivers resulted in that pool formation that is favoured by the anopheles mosquito, and that malaria was added to the hardships borne by a people whose land had ceased to be fruitful."

('The Secret of the Tanks', *Loris*, Vol. IV, No. 6, June 1945, pp. 215-217).

T. W. Tyssul Jones: *Wars, Climatic Change and Malaria*

"...The Cholan conquest was one of mass destruction. To the Chola Emperors, Ceylon was a country of great riches, with a people with an alien creed. Attracted by the wealth of the monasteries their wish was to conquer the country in as short a time as possible.

"The breaching of the channels was to them a necessary, though wholly unwise, tactics of war. The old city of Anuradhapura was supplied initially water from the tank of Kalawewa, some 50 miles distant from the city. What easier means of isolating the city than by cutting the channel somewhere, along its 50-mile conduit? Such tactical operations would be, and are carried out in modern warfare, and the Cholan Emperors were in no wit less wise.

"These devastating wars commenced with the Cholan Emperor Parantaka I. He first invaded Ceylon about A. D. 918, but owing to trouble in his own country from the Rashtrakutas of the Deccan, he returned leaving the people of Lanka in great fear. After this time and before Ceylon became a province of the Cholan Empire, under Raja Raja I about A. D. 1004-5, there were periods of counter-attacks by the Sinhalese and reprisals by the Cholas.

"All this added to the destruction of the tanks and channels, and with some minor works by Parakrama I, there is no reference to any irrigation works. From this period onward there was a gradual decline.

"The forest gradually crept in; the watercourses, with their larvicidal fish, gave way to intermittent pools. The vector species breeding places increased: the lowered health of the people as a result of their impoverished conditions led the way to the present state.

"The lessons of the past were forgotten in the follies of the Cholan conquest. The genius of the Indic civlization which enabled a once parched land to be turned into a granary with a healthy and self-supporting people gradually declined. A war-worn people gave up the struggle and malaria began its terrible course.

"Since earliest geolgical time, change and not uniformity has been the rule...

"All the evidence points to moist conditions prevailing in western Asia and northern Africa about 500 to 600 B. C. followed about 200 B. C , by a drier climate. About A. D. 100 climate conditions were again more favourable. During the next 5 centuries there was a gradual increase in aridity reaching its worst state about A. D. 650. An improvement then followed culminating about A. D. 1000, succeeded by another bad spell which reached its worst condition about the 13th century. There was a slight recovery in the 14th century from which time there has been a gradual increase in aridity.

"In these areas therefore there has been a pulsation in climate and in order to prove this Huntington (1922) carried out an investigation in California. The thickness of the annual rings of trees furnish a reliable indication of variations in the water supply from year to year.

"During the years 1911 and 1912, Huntington measured the thickness of the annual rings of the Sequoia tree, which varied from 250 to 3,250 years, and from the figures and graphs obtained there appeared to be a general agreement between the main climatic changes in western Asia and a similar region of the United States of America. This suggests that climatic changes are phenomena which are probably world wide.

If this is indeed the case then the pulsations in climate set forth above assume a considerable significance. From the 10th century A. D., with a minor improvement in the 14th, the general tendency has been towards arid conditions. The onset of these arid conditions occurred about the 10th century at a time when the Sinhalese tanks and channels were being subjected to the destruction due to the devastating wars mentioned earlier in this paper.

"A prosperous self-supporting and healthy people were henceforth to be denied the irrigation waters for their fields, and were also to be subjected to increasing arid conditions. The paddy field. which had hitherto given subsistence to the people from the 10th century onward, failed to maintain sufficient staple food owing to lack of water. The general health of the population therefore declined.

"The vector species, with a comparatively low sporozoite rate, which depends upon numbers per unit of population for transmission had hitherto not the facilities for abundant breeding Combined with the increased pool formation in the once flowing channels and the once filled tanks there is to be added in the years succeeding the 10th century A. D. an increased breeding potential in the rivers. Normally these rivers dry up after the rains with the increased formation of pools favoured by the vector species. With the increase in arid conditions, the duration of the river flow would decrease with a corresponding increase in the length of time that the pools remain.

"There can be no doubt that the vagaries in climate did much to augment the difficulties resulting from the destruction of the irrigation system. With a lowering of the people's health due to impoverished conditions, the increase in breeding of the vector quickly

resulted in those endemic malaria conditions which brought about the depopulation of districts referred to by the Dutch colonists".

('Malaria and the Ancient Cities of Ceylon', *Indian Journal of Malariology* (Calcutta), Vol. V, 1, March 1951 pp. 131-134).

B. H. Farmer: *A Combination of Factors*

"What caused the decline? There has been considerable controversy over this question, although most authorities blame, directly or indirectly, the Tamil invasions and the internal dissensions of the confused period after A. D. 1235. Probably the depopulation of the Dry Zone is not to be ascribed to any one cause such as these invasions and dissensions (as some have maintained), but rather to a combination of factors. Thus there must inevitably have been a breakdown of the organized government necessary to the maintenance of the major irrigation works, together with the death or flight to the Hills of a substantial part of the peasantry. There is evidence, too, that malaria either arrived for the first time, or became more virulent. And there may have been deliberate destruction, although it is not necessary to invoke this, since under Dry Zone conditions *bunds* are soon breached and channels choked with weeds and silt by natural agency, given a few years' neglect. (Some breaches, such as that at Padawiya, may well have occurred long before the period of general decay, and have been due to the building of *bunds* on insecure foundations which the ancient engineers, for all their skill, could not have discovered in advance of construction.)

"It is also possible that, locally at least, other causes of depopulation have been at work. It is fashionable to attribute the decay of ancient civilizations to soil erosion, and prophets of the current creed have not been lacking in Ceylon. Thus H. I. S. Thirlaway has maintained that the decay of tanks, brought about by soil erosion and consequent silting, was the cause and not the effect of the collapse in the Dry Zone. Serious silting of tanks there undoubtedly was, and it will be seen that in many areas the problem is serious today. But the fact remains that there has not been a single tank which, when its breaches have been restored, has failed to function because of silting On the other hand, *local* depopulation may have occurred because of the exhaustion of particular areas of soil (e. g. the *damanas* of the east).

" .....

It is doubtful whether malaria was endemic in the ancient Dry Zone; there appear to be no certain references to it in the texts, and such accounts as there are of plagues and pestilences seem to be more suggestive of some endemic fever, and not of endemic malaria. There is, for example, the passage in the *Rāja Ratnacari* which reads: '...on account of a pestilential fever, which became general throughout the island, more dreadful than the plague which broke out in our own Budhu's time, in the city called Wisawla Maha Nuwara, all flesh began to die'. And as L. Nicholls pointed out, it is inconceivable that the ancient cities of Ceylon could have been built by a people in the inert, febrile state of their nineteenth-century descendants. On the other hand, it is not now as fashionable as it was when Nicholls wrote to attribute the waning of any civilization to malaria, and, as has been hinted already, malaria may well have been one factor only, albeit an important one, in the circumstances which led to the decay of ancient Ceylon."

(Pioneer Peasant Colonization in Ceylon, (Oxford Univ. Press, 1957), pp. 16, 17, 21).

Sinnapah Arasaratnam : *A Combination of Factors*

"A combination of factors reacting on each other had brought about this phenomenal collapse. For a long time it seemed an easy solution for historians to point to the Dravidian invasions, the Chola occupation (1017-70), and the ravages of the Kalinga kings as the sole explanation. It is now recognized, that these are not sufficient and that one has to look deeper into the social structure and economic organization. The invasions were, no doubt, factors that exposed the weaknesses of Sinhalese political power, but there is evidence that they were not exclusive agents of destruction. In earlier times the Sinhalese kingdom had been able to rise again after temporary setbacks, but that it could not do so now points to some inherent weakness. The rule of the foreign Kalinga kings was the more unfortunate, because, at a time when the state ought to have stepped in to remedy the ill effects of foreign invasions, these kings had neither the ability nor the inclination to do so. The fact that, even at this time, the Sinhalese dynasty could not throw up men of stature to reassert

political leadership shows that the natural causes of decay of a long lineage of kings had set in.

"Some of the seeds of subsequent decline had been sown in the period of greatness. The twelfth century was in many respects the apex of Sinhalese glory. At this time the Sinhalese had been more than an insular power. Under Parakrama Bahu I they participated vigorously in south Indian and Southest Asian politics. We have noted their artistic and technical achievements; yet the magnitude and splendor of these works consumed a great deal of the state's resources Foreign wars drained the treasury without bringing any tangible benefits in return. The great religious edifices were economically wasteful, and the construction of so many of these in such a short time must have strained the economy. The patronage of religion by the state had become a great burden, as religious institutions had grown enormously. There is evidence that the incidence of taxation was rather heavy at this time. The governmental machinery itself was overcentralized under Parakrama Bahu. This was a burden which subsequent kings had to carry but for which they lacked the ability. Parakrama Bahu I thus bequeathed to his successors a tradition of excessive state expenditure and a cumbersome centralized administration. A period of economy and cautious spending would have been necessary to recuperate but conditions did not permit such a policy.

"The elaborate system of irrigation on which the country's agriculture depended necessitated a bureaucracy both in the center and at the village level. This bureaucracy was drawn from the landed gentry, the traditional leaders in society. They were the ministers at the capital and the superintendents of irrigation and agriculture in the villages With the Kalinga dynasty the power and position of the Sinhalese nobility declined These kings tended to rely on their compatriots to fill the higher roles in the administration. In fact, the richer members of Sinhalese society were subject to plunder and pillaging by these foreign officials. The Kalinga kingdom had a quasi-military form of government. Bodies of mercenary troops were scattered about the country to keep law and order, and military leaders undertook many administrative functions, superseding the traditional gentry. Besides, members of the gentry found it politic to withdraw to the courts of Sinhalese leaders who had set themselves

up elsewhere. Thus, the traditional methods for the upkeep of the agricultural and irrigation systems broke down. The military overlords were not interested in attending to this onerous task. The irrigation system had to be kept in constant repair; silting, which would lead to major breaches had to be continuously guarded against. One by one many of the larger tanks were breached, owing to neglect, and large tracts of land lost their supply of water. There also was a certain amount of deliberate destruction by rival factions struggling for power. When the irrigation system broke down, it was obvious that the dry zone could not sustain a population as dense as before. Hence the movement toward areas of greater rainfall. Jungle spreads fast into land left uncultivated for even a short time. A brief period of neglect was therefore bound to do permanent damage to the agricultural sytsem.

"Other hypotheses are advanced to explain the Sinhalese decline. In certain areas the same land had been cultivated in much the same fashion for centuries. Would this have led to exhaustion of the fertility of the soil? This factor would have caused the depopulation of some regions, or at least a lessening of the capacity of the land to support the existing population. The spread of malaria in the dry zone may also have been a factor, though in the latter part of the period of decline. It is noteworthy that, when attempts were first made in the twentieth century to revive agriculture in the dry zone, malaria was found to be the main obstacle. It had left the people inert and febrile and caused a very high death rate. British administrators found that all the aforementioned factors had operated cumulatively for a long period, leaving behind the skeletal remains of a once prosperous economy."

(*Ceylon* (Prentice-Hall, Inc., Englewood Cliffs, New Jersey 1964), pp. 93-95).