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*Convocation Address**

CHANCELLOR, Vice-Chancellor, and as I may now say, fellow-graduates of the University, Ladies and Gentlemen, I am deeply sensible of the great honour you have conferred upon me in making me a Doctor of the University of Ceylon and so a member of your Academic Society. It is however an honour which I cannot take for myself alone, for I conceive that it is at least in equal measure, or as I myself would say in far greater measure, a recognition of the association which has existed for so long between the University of Ceylon and the University fo London, and in particular between the School of Oriental Studies, on the staff of which I served for 36 years, and of which I was Director for 20, and the Oriental and History Faculties of this University. Long may that association continue, widening and deepening with every year that passes. For I can conceive of nothing more conducive to the cementing of old friendships and the forging of new friendships between our two peoples than a mutual sharing, side by side, in the labours and the joys of scholarship and research. All through my long association with Indological studies, which extends now over a period of nearly 60 years, I have become increasingly aware of the beneficent power which such an association of scholars, whether young or old, can exercise in promoting the growth of friendship between peoples, translating—no, I would rather say making of no import whatsoever—all differences of race or history or cultural tradition. Never have I been more certain of the truth of this than during the last years of my Directorship of the School of Oriental Studies, when we were enabled to arrange Conferences in London in the field of history, to which scholars were invited to come from Asian countries, including Ceylon, some of them for the Conference itself, but some also to stay beforehand for several months, preparing with their London colleagues the papers to be laid before

**By Sir Ralph L. Turner, F.B.A., Litt.D. (Cantab.) on 15 November 1958 at Peradeniya.*

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the full Conference when it assembled. The close association and co-operation of such scholars, working side by side to solve common problems and with a common aim, produced in them that community of interest and understanding from which true and lasting friendships arise cannot fail to be of permanent benefit to our fellow-countrymen. The holding of these Conferences in London has been made possible largely through the generosity of American Foundations. I would express here the earnest hope that in the future our Governments also, both yours and mine, may be made aware of the importance of such work, and so by the provision of what would be really quite modest sums, enable senior scholars of both countries to work for a time side by side with their colleagues from other Universities, whether in the fogs of London or in the lovely surroundings of your own University here in Peradeniya.

If I feel confidence that this community of interest and close co-operation in our common studies—and here I must ask the forgiveness of the members of other Faculties if I speak mainly of those fields in which I personally have been concerned : the study of the history and languages and great literatures of Asia—if I feel confidence that this co-operation will continue, it is because I have seen during my life-time a considerable change in the attitude of my own countrymen, and particularly of my own Government, to these things.

I have just come from the Deccan College and the University of Poona where the kindness of my friends in presenting me with a volume of Studies has only too forcibly brought home to me the fact that I have already passed the limit of 3 score and 10 years set by the Prophet as the span of man's life. I would ask you to bear with me for a few minutes while I exercise the privilege of old age to indulge in reminiscences, not in any way as *laudator temporis acti*, a praiser of the past, but as one who looks forward with hope and confidence to a future in which there will be a continued growth of that association between scholars of East and West, and particularly between those of your country and his, which he has been privileged to see grow and flourish during the years of his life. For as my mind wanders back through the long years and the concatenation of events which have brought me here, those events sometimes seem to me to have been something more than the result of pure chance.

Nearly 60 years ago when I was about 12 years old, chance did indeed bring into my hands one of those admirable little primers, which in those far-off days cost 6*d*. new, and a penny or two second-hand. It was 'Philology' by John Peile, and in it I read of the existence of Sanskrit as a sister-

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language to English and to the Greek and Latin I had just begun to learn at school. A little later chance again brought my father back to Cambridge and there at the Perse School I came under one of the greatest of headmasters, W. H. D. Rouse. Rouse was not only a fine classic and a superlative teacher, but born and nurtured in Bengal, he was also an accomplished scholar of Sanskrit and Pali. You perhaps here will remember his name as the translator into English of Fausboll's edition of the Dhammapada, while in the last years of his life he was engaged upon a translation of a Sanskrit Buddhist text, the Divyāvadāna. Learning of my interest in Philology he started several of us in the Sixth Form on the elements of Sanskrit. In that little group there were the present Masters of two Cambridge Colleges, Dr Tillyard who became a great authority on the poet Milton, and Sir George Thompson, who, as son of the famous J. J. Thompson, was among those that helped to split the atom, with all its potentialities for good and evil. So you see what an early training in Sanskrit can do even if it is not pursued very far. For I was the only one that stuck to it, and when I myself was admitted as a scholar of Christ's College, I knelt and placed my hands between those of the Master, that same John Peile, who had written the little primer of Philology and who more than any other had been instrumental in founding the Chair of Sanskrit in the University of Cambridge. There a close friendship I formed with a fellow-undergraduate from Bengal, the late Sir Satyendranath Roy, and later with a student from Ceylon awakened in me that interest in the relationship of the modern Indo-Aryan languages that has remained the major intellectual interest of my life.

When in 1913 at the age of 25 I came to India to teach English and Sanskrit in the Queen's College—that I had the audacity to attempt such a thing in Benares of all places in the world only the rashness of youth can excuse—there, in the ancient sacred city of Kāsī, I found myself in a world with which I felt already some degree of familiarity. A few days after my arrival I had an experience the memory of which remains with me to this day. I went out one evening to Sarnath, where the great Stupa, Dhamek, and the column set up by Asoka with the famous lion-capital which has been taken as the symbol of the Republic of India and the then but partially excavated remains of the ancient monastery mark the spot where the Buddha, after his enlightenment, preached his first sermon. As I sat among the ruins in the lovely twilight of an Indian winter evening the past began to re-create itself and from the ruined halls I seemed to hear re-echoing down the corridors of time the words : Buddhaṁ saraṇaṁ gacchāmi, Saṅghaṁ saraṇaṁ gacchāmi, Dhammaṁ saraṇaṁ gacchāmi.

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"I heard,
Through the long centuries, the faintly whispered word :
Thus says the Lord : 'For all who fear death's dreadful maw
Waits refuge in the Church, the Buddha and the Law.'"

As the fancied sound died away, I saw coming over the swell of ruin-strewed ground two Buddhist monks, with shaven heads and saffron robes. They were pilgrims from Burma and I rose to speak to them. They knew no English, I no Burmese, and the only tongue in which we could exchange a few words, halting on my part, was the ancient language of the Buddhist scriptures, Pali, which you, bringing originally from India, have guarded and enriched in the Isle of Lankā.

It was about that time and partly as a result of that almost mystical experience that there grew in me a conviction of the need for a much greater extension in my own country of knowledge of the East, of its long history, of its great languages and literatures and philosophies, including I would say, above all, the philosophy and teaching of Buddhism which stem from the words of the Buddha himself, which have exercised so profound an influence, and at no time more than the present-day, upon the thought of mankind, perhaps even upon its destinies. I knew, of course, of the Reay Committee and its report recommending the establishment of a School of Oriental Studies in London. But at that time, in 1913, it seemed unlikely that anything would be done about it.

Nearly 40 years later I once again visited Sarnath, this time in the august company of Vice-Chancellors of Universities from all over the Commonwealth. In the full glare of the midday sun, and the somewhat, I regret to say, commercialised surroundings of today, I could not recapture all the feeling of that earlier visit ; but disappointed as I was, perhaps a little disillusioned, I was comforted by the knowledge that back there in London the somewhat vague aspirations of that youth at the beginning of the century had taken concrete form and that there was now in London a great institution with more than 150 Professors, Readers and Lecturers, forming an integral part of the University, in which almost every aspect of Asian life and thought and history was being studied, to which students were coming in increasing numbers from every part of the world, and where especially ever-strengthening bonds of work and interest and friendship were being forged between the scholars of my country and my own beloved lands of India and Ceylon.

But the intervening years, which had seen the creation of this great School in London and the extension of Orientalist studies in other parts

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of the United Kingdom, to which, of course, many others had contributed far more than I myself,—these intervening years had also brought me a more personal and deeper satisfaction. From Benares I had returned to London in 1922, and for 15 years, before I succeeded Sir Denison Ross as Director of the School, there came to me in London both from India and Ceylon a succession of post-graduate students to carry on research into the history of the languages of India and Ceylon, both Indo-Aryan and Dravidian. I can say without hesitation that those who came were nearly all far better Sanskrit or Pali scholars than I was or now ever shall be and, of course, they all had a far more intimate knowledge of their own languages of some of which I was abysmally ignorant. I often marvelled at their self-restraint in not telling me so. But perhaps I was able to contribute something in method and way of approach to our problems. At least I know one thing : Those years were the happiest of my life, and the memory of our discussions, whether in my room at the School or at week-ends in our house of Haverbrack, is an abiding joy to me.

And now that I return once more to Ceylon, what could a teacher want more ? For here in the Oriental Faculty and in the Dictionary Department of the University I find myself surrounded by my pupils and my pupils' pupils, my sisyas and prasisyas, to use a Sanskrit term, instructing and inspiring younger generations.

It was after that second visit to Sarnath that I had an opportunity in 1951 in the course of my first visit to Ceylon of seeing the new home of your University. At that time only a few of these beautiful buildings had been erected and a beginning only had been made with the task of transferring the faculties from Colombo to Peradeniya. It was then I think only the Faculty of Law which had made the move. The Law is sometimes considered to be one of the most conservative of human institutions : it would, therefore, perhaps have been surprising that it was that Faculty which made the first move, were it not that your predecessor in office, Vice-Chancellor, was a great lawyer and a famous maker of new constitutions. Now I have the good fortune to return after the lapse of 8 years and to see the University fully established in surroundings incomparably more beautiful than those of any other that I know. Through your favour, Chancellor, and that of the Council and of the Senate I also am a member of this University. Although I am a very young graduate in one sense, may I be permitted as one older at least in years to say one thing to my fellow-graduates and to the students of the University. You are members of a University of which you have good reason to be proud. See to it that the University in its turn shall be proud of you.

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The Ancient names and Builder of the Padaviya and Naccaduva tanks

The Padaviya Tank, which has recently been restored, is one of the largest among the ancient irrigation reservoirs in Ceylon[1]. Standing on the bund, close to the great breach before it was closed, there was a stone slab with an inscription which, in a Sanskrit and a Sinhalese stanza, has recorded that Parākramabāhu I ' caused it to be constructed'[2]. But, as is the case with other ancient irrigation works at which that monarch had set up similar inscriptions, e.g. the dam at Äḷahära, Parākramabāhu only restored this tank. For the *Cūḷavaṁsa* includes Padīvāpi in a list of ancient tanks which were breached in his time, and were restored by Parākramabāhu I[3]. Neither the *Cūḷavaṁsa* nor the *Mahāvaṁsa* has any other reference to the tank under this name ; but as it has been called an ancient tank by the chronicler who recorded the events of the reign of Parākramabāhu I, its original construction must have been several centuries earlier, and the name by which it was known in the twelfth century was not the same as its appellation in more ancient times. The *Pūjāvalī* credits Saddhātissa (*circa* 137—119 *B.C.*) with the construction of Padī and several other tanks[4]; but the *Mahāvaṁsa*, in its account of the reign of that monarch, makes no such mention. This statement of the *Pūjāvalī*, therefore, may well be doubted, particularly as there is reason to conclude that irrigation works of such magnitude as the Padaviya were not undertaken at so early a date.

Below the embankment of the Padaviya Tank are to be seen the remains of an ancient city now called Moragoḍa[5], and on this site have been discovered a pillar-inscription of the reign of Kassapa IV (898—914), which has been deciphered and translated by Wickremasinghe[6]. This document refers to the ancient city by the name of Pädin-naru[7] of which

1. For a description of the Padaviya tank, see R. L. Brohier, *Ancient Irrigation Works in Ceylon*, Part I, pp. 23—25.
2. Bell, *A. S. C. Seventh Progress Report*, p. 73.
3. *Cūḷavaṁsa*, Chapter LXXIX, vv. 31—38.
4. *Pūjāvalī*, 34th Chapter, edited by Mābōpiṭiye Medhaṅkara Thera, p. 8.
5. For an account of the remains at Moragoḍa, see Bell, *Seventh Progress Report*, pp. 41—43.
6. *Epigraphia Zeylanica*, Vol. I, pp. 200—207 ; plate facing p. 204.
7. Wickremasinghe has read the name as *Pa(ḍo)nnaru* and gives *Pädān* also as a possible reading. The *i*-sign over the d is reasonably certain in the estampage ; what has been taken as the *ā*-or the right side of the *o*- stroke is extraneous.

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the Pāḷi form would be Pācīna-nagara, 'the Eastern City.' It is thus clear that the city below the embankment of the Padaviya tank was the headquarters of the Eastern District (Pācīna-passa), one of the four main territorial divisions, corresponding in terminology to the disavanis of Kandyan times, of the ancient Rājaraṭṭha. The name by which the tank itself was known in the twelfth century was thus derived from that of the city close to it, and the district (Padī - raṭṭha) in which it was situated. *Padī* is equivalent to Skt. *prācī* and P. *pācī ;* it means 'Eastern,' and was an appropriate name for the most important tank in the Eastern District, Quarter or Province. But it is very likely that such an important tank as Padīvāva had its own distinctive appelation before it came to be generally referred to by that of the territory in which it was situated.

The Moragoḍa pillar-inscription contains topographical details from which the earlier name of the Padaviya tank can be inferred. The village to which immunities were granted by this edict is said, not only to have been situated in the territorial unit (*kuḷiya*) called Pädin-naru, but also to have come within another, possibly smaller, division named Danā-diyadara. Wickremasinghe's reading of the relevant portion of the record is *raṅdanā diya-dara*, given as doubtful. What Wickremasinghe has read as *ra* in *raṅdanā* is really the *ū* stroke and the right half of the syllable *vū ;* there is no support for the nasal before *da* in the estampage that he has reproduced. The correct reading thus is *Danā-diyadärä*, which is the locative form of *Danā-diyadara*. Moreover, the correct form of the name, with a slight difference, is preserved in the pillar-inscription of Udaya II (887—898) at Buddhannehäla[8], seven miles to the north of Moragoḍa. The village of Nännaru, with which this edict is concerned, is said to have been in the territorial unit called Danā-dakadara. Wickremasinghe gives the initial *da* of this name as doubtful, but what is visible of it in the estampage precludes it from being read as any other syllable. Wickremasinghe also reads *daka* as *dak ;* but the stroke that he has taken as the *virāma* appears to be an extraneous one. Even if we adopt the reading *dak*, it does not much affect the form of the name, for in this period a final or medial vowel was often elided. What is certain is that *daka* or *dak* in the name, as it occurs in the Buddhannehäla epigraph, is a variant form of *diya* in the Moragoḍa inscription[9]. We may, therefore, conclude that *Danā-dakadara* or *-diyadara* were alternate forms of the name of the territorial unit in which the villages affected by these two epigraphs were situated.

8. *Epigraphia Zeylanica*, Vol. I, pp. 191—200 ; Plate facing p. 196.
9. *Daka* is the Pāḷi or Prakrit form from which the Sinhalese *diya* is derived.

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The word *dakadara* has been met with in other inscriptions of the ninth and tenth centuries, usually as the second member of a compound of which the first is the name of a tank. The unpublished pillar-inscription found at Galnäva in the Nāgampaha Kōraḷe[10] refers to the village affected by the document as coming under Baḷalu-dakadara. And Galnäva is less than a mile from the main channel (*yōda*-äḷa) issuing from the Baḷalu-väva. *Daka-dara*, therefore, must have denoted either the main channel from a tank, or the lands irrigated by a tank. The pillar-inscriptions found at Moragoḍa just below the embankment of the Padaviya, and at Buddhannehäla, seven miles north of it, both refer to villages in or on the Danā-dakadara. These two inscribed pillars do not appear to have been removed far from their original sites, and must have been set up in the vicinity of the villages which are mentioned in them, if not in the villages themselves. These two villages must have been situated in the area irrigated by the Padī-väva, the main channel issuing from which must have continued northwards for at least seven miles. Danādakadara, consequently, must be the old name of the main channel of the tank now called Padaviya and, on the analogy of Baḷalu-dakadara, the conclusion is inevitable that, in the ninth century, the name of this tank was Danā-väva. And the only name of a tank found in the chronicle with which 'Danā-väva' can be equated is 'Dhana-vāpi', listed among the irrigation works of Moggallāna II (*circa* 531—551)[11]. The long *ā* in *Danā* presupposes a form *Dhanaka ;* the suffix *-ka* is often found added to proper names in documents of the early centuries of the Christian era, and the chronicles, more often than not, make use of the names without this suffix.

The only reference to Dhanavāpi (Danāväva) in the *Cūḷavaṁsa*, as it has been translated, appears to go against the proposed identification of that tank with Padaviya. For Geiger's rendering of the relevant passage reads : 'He dammed up the Kadamba river among the mountains forming thereby the Pattapāsaṇavāpi, Dhanavāpi and Garītara tanks'[12]. Padaviya is in no way connected with the Kadamba river (Malvatu Oya), and a tank formed by the damming of that river cannot obviously be the same as the Padaviya. But the passage as it occurs in Geiger's translation does not make much sense when examined along with the relevant geographical data and the methods adopted by the ancients in the construction of tanks. The Kadamba river neither rises in, nor flows through, mountainous country. And the passage quoted above appears to state that by damming

10. *A.S.C., Annual Report for* 1895, p. 9. No. 9 in the list of inscriptions. An eye-copy of this pillar inscription, prepared under Bell's direction, is available in the Archaeological Department.
11. *Cūḷavaṁsa*, Chapter XLI, v. 61.
12. *Cūḷavaṁsa*, translated by Geiger, pt. i, p. 57.

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the river at one spot three tanks were constructed. Where tanks have been built by the damming of streams, such obstruction of the natural flow of the water at one point normally results in one tank. These considerations should lead one, not to doubt the identification of Dhanavāpi with Padivāva on the evidence supplied by the inscriptions, but to examine, in the light of that evidence, whether Geiger's translation given above faithfully conveys the meaning which the chronicler intended to express. For this, the relevant portion of the Pāḷi text is given below :

Bandhāpesi Kadambaṁ ca nadiṁ pabbata-majjhato
Pattapāsāṇa-vāpiṁ ca Dhanavāpiṁ Garītaraṁ
Gaṇhāpesi, sa dīghāyuhetu kammaṁ ti sādaro
Likhāpesi ca saddhammaṁ vatthupūjam ca kārayi.

L. C. Wijesinha, Geiger's predecessor in translating the *Cūḷavaṁsa* gives the following rendering : 'He threw a dam across the Kadamba river, from the middle of the mountain, thinking that such works tended to long life. And from the great love that he bore to his subjects, he built the tanks Pattapāsāṇa, Dhanavāpi and Garītara. He also caused sacred books to be written and made offerings to the sacred objects'[13]. Sumaṅgala and Baṭuvantuḍāve, in their translation of the chronicle into Sinhalese, interpret the passage in the same manner as Wijesinha[14] ; in fact the latter's English translation at this point, as elsewhere, leans heavily on the Sinhalese version. Wijesinha's version that the damming of the Kadamba river was undertaken by the king due to a belief that such works tended to long life has been due to taking that the sentence should end with a line. But there was no connection of irrigation with longevity according to ancient beliefs. What the king undertook expecting to live to a ripe old age was the multiplication of sacred books and the offerings to the sacred objects. Geiger has correctly taken the sentence dealing with the irrigation works as ending with *gaṇhāpesi* in verse 62. But the native scholars who have translated the chronicle into Sinhalese and English, respectively, have been more faithful to the original Pāḷi, in rendering the passage dealing with Moggallāna II's irrigation works as comprising two separate sentences, than the German professor has been in treating it as a single sentence. For *bandhāpesi*, of which the object is *Kadambaṁ nadiṁ* and *gaṇhāpesi*, having the other three proper names as objects, are both finite verbs. There is no word in the original to correspond to 'thereby' in Geiger's

13. L. C. Wijesinha, *Mahāvaṁsa*, part ii, p. 12.

14. The Sinhalese rendering of Sumaṅgala and Baṭuvantuḍāve *Mahāvaṁsa*, Part I, (p. 20) reads : පවිතය මැදින් කොළොම් හොය බැඳවී. දීඝායුෂක හෙතු ක්‍රියාය යි ආදර සහිත ව පත්ප හන් වැව දන වැව ගරීතර වැව බැඳවී. සදහම්ද ලියවී. තුනුරුවන් පූජා ද කෙළේ.

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translation, and *gaṇhāpesi* has been incorrectly rendered by him as a present participle. There is also no justification in the context to assume that the statement in the second sentence is a consequence of what has been stated in the sentence which precedes it.

However, the damming of a river would have been undertaken either for diverting its water into a channel, or impounding it in a reservoir. It is, therefore, not impossible that one of the tanks mentioned in the above passage was formed as a consequence of the damming of the Kadamba-nadī, though the chronicle does not expressly state it to have been so. We have, therefore, to examine the wording of the relevant Pāḷi passage to ascertain whether the throwing of a dam across the Kadamba-nadī by Moggallāna II resulted in the formation of a tank ; we first take into consideration the phrase *pabbata-majjhato*, of which Geiger's rendering 'among the mountains' as well as Wijesinha's 'from the middle of the mountain' are equally inapplicable to an irrigation work connected with that river.

The word *pabbata* (Skt. *parvata*) has been used in Pāḷi and Sanskrit texts not only to denote a great mountain such as the Himalayas, but also an ordinary rock boulder. The cluster of boulders to the south of the Āḷāhana-pariveṇa at Polonnaru is called Gopāla-pabbata in the *Cūḷavaṁsa*[15]. The word may also be used of any hill or eminence. Being the first member of a compound, *pabbata* may be treated as in the singular or in the plural number. *Majjha* (Skt. *madhya*), of which the usual meaning is 'middle,' may also denote 'interval,' 'interspace,' 'opening' or 'gap.' The word is used adverbially with the ablative termination *-to* ; this is perhaps due to the author of the *Cūḷavaṁsa* translating into Pāḷi a word like *mädin* in the Sinhalese source that he utilised. Such a form, though having the instrumental-ablative termination, is locative in sense; compare, for example, an expression like *etek tänin* in *Sigiri Graffiti*, No. 482. *Majjhato* may, therefore, be translated as 'between.' *Gaṇhāpesi* is the causative third person singular in the past tense from the root corresponding to Skt. *grah*, of which the primary meaning is 'to take' or 'seize,' but may acquire various shades of secondary meanings. Forms from this root have been used in the *Cūḷavaṁsa* to indicate the construction of tanks ; compare, for example, *gaṇhitvā* in chap. 38, v. 41 and *gāhayī* in chap. 42, v. 8. Thus, the correct literal translation of the passage in the chronicle dealing with the irrigation works of Mahinda II would be : 'And (he) dammed the Kadamba-nadī between (two) rocks (or ridges. He) also built the Pattapāsāṇa tank, the Dhana tank and Garītara.'

15. Chapter LXXVIII, v. 65. See Geiger's translation of the *Cūḷavaṁsa*, pt. 2, p. 110, n. 1.

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Referring, as it does, to the construction of a dam across a river like the Malvatu Oya, the first of these two statements in the chronicle would indicate a point in its course where it flowed between two rocks or elevated grounds on either side. Let us now examine whether any of the tanks referred to above has been built by damming the Malvatu Oya at such a point. For this, it is necessary to ascertain the modern name of a tank, other than the Dhanavāpi, mentioned in the passage quoted above. Fortunately, we have inscriptional evidence for the identification of the first named tank, Pattapāsāṇavāpi.

The Sinhalese form of this name would be *Patpahaṇ*. Two fragmentary inscriptions of the ninth century, one found at a place named Ihalagama and the other at Māvatavāva, both in the Kalāgam Kōrale of the Anurādhapura District[16], inform us that the respective villages to which immunities were granted by the edicts engraved on the pillars were in a territorial division called Patpahaṇ-bim. In the ninth and tenth centuries, districts were generally named after the most important villages or townships within their boundaries, and such villages or towns were invariably situated by the side of a large tank. The town or village and the tank generally bore the same name. The important tank closest to Māvatavāva and Ihalagama, therefore, must be the Patpahaṇ-vāva (Pattapāsāṇa-vāpi). Ihalagama is seven miles, and Māvatavāva four miles, from the Nāccadūva tank, a major irrigation work of ancient days. Consequently, we have to conclude that the modern Nāccadūva and the ancient Patpahaṇ (Pattapāsāṇa) are identical[17]. And this is what Parker says of the manner in which the Nāccadūva tank was built by the ancient Sinhalese engineers. 'A careful examination of the valley[18] showed that at 3½ miles below the dam[19] in the river, two ridges projected into it, leaving a gap of only a mile between their ends. In order to increase the water supply it was then decided to raise an embankment across the valley at this spot, closing up this gap,

16. *A.S.C. Annual Report for* 1895, p. 9. Nos. 31 and 32 of the List of Inscriptions. I am indebted to Mr W. S. Karunaratna for checking the readings of these two inscriptions in the eye-copies in the Archaeological Department.

17. Parker is inclined to give credence to a tradition which credits Mahāsena with the construction of the Nāccadūva tank (*Ancient Ceylon*, p. 408f). R. L. Brohier (*op. cit*, pt. 2) in the diagram facing p. 16 states that the Nāccadūva tank was built in 866—901 A.D., with as much of assurance as that it was restored in 1906 A.D., on the strength of evidence summed up in the text as follows : 'The ancient name of this tank has not been definitely identified. There is a tradition that it was built by Mahasena (277—304 B.C.) and that this tank is the Mahadaragala of the *Mahāvaṁsa*, but in one or two instances it has been accepted by students of Sinhalese history that the works date from the time of King Sena II (866—901 A.D.). Nevertheless, conjecture—both in respect of the derivation of the name and the period in which it was constructed—will ever present an alluring quest.'

18. Of the Malvatu Oya.

19. From which a channel led to the Nuvaravāva.

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and impounding the floods in the reservoir thus formed, which is now termed Nāccadūwa'[20].

It will thus be seen that the description in the chronicle of the manner in which the Kadambanadī (Malvatu Oya) was dammed in the reign of Moggallāna II agrees very well with the constructional details of the Nāccadūva Tank. The chronicler, or the sources which he utilised, must have made a particular mention of the river being dammed between two ridges as it was considered in ancient times to be a proof of the skill of those responsible for the selection of the site. Indeed, the selection of this site for the throwing of the dam across the river has greatly minimised the labour and expenses of constructing the tank, for such a large reservoir as the Nāccadūva has a bund not exceeding a mile in length, whereas some other reservoirs of comparable size have bunds twice or thrice that length.

Thus, though the chronicle does not expressly state that the throwing of a dam across the Kadambanadī had as its consequence the formation of the three tanks named in the passage quoted, it has been found that one of them, the Pattapāsāṇavāpi, was formed as a result of that work. It might, therefore, be argued that the other two tanks named in the passage were also similarly formed. Against such an argument is the fact that this particular manner of throwing a dam has been noticed along the course of the Malvatu Oya only at this point ; Nāccadūva Tank is the only major irrigation work for the building of which this river has been dammed. It is possible that there are small village tanks constructed by damming the river on its upper course ; but such minor works are not likely to have been undertaken by kings. Of the irrigation reservoirs of Moggallāna II, therefore, it was the Pattapāsāṇavāpi alone that was a result of the damming of the Kadambanadī. The lack of precision in the text of the *Cūḷavaṁsa* at this point may be explained by assuming that, in the old Sinhalese source utilised by its author, there was a statement that the Patpahaṇvāva was constructed by the damming, in the manner above described, of the Malvatu Oya, followed by another recording the building of the other two tanks, and that the chronicler recorded the damming of the river in one statement and the building of all the three tanks in another.

Dhanavāpi could not thus have been connected with the Malvatu Oya, and its identification with the Padaviya Tank is not discredited by the reference to it in the *Cūḷavaṁsa*. That reference furnishes evidence, when taken together with the inscriptions referred to above, that Moggallāna

20. *Ancient Ceylon*, p. 405.

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II was the original builder of two stupendous tanks ; the Padaviya and the Nāccadūva. Even if he was the builder of one only of these tanks, he deserves a place among those ancient rulers of the Island who, by their public works, ensured the prosperity of the land. The greatness of Moggallāna did not rest solely on his achievements as a tank-builder. His valour was proved in the single combat that he fought to wrest his patrimony which had been usurped by his younger brother. He was a poet as well, and encouraged learning. In the words of the chronicle, his feeling for his people was like that of a mother for a son of her own body. Now that the two great irrigation works of this monarch are once more functioning to make large areas of the Island productive, it is hoped that the people who benefit from them today will not allow his name to fall into oblivion.

S. PARANAVITANE

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Sinhalese Naval Power

DURING a period whose beginning is uncertain but whose termination may be placed, approximately, towards the end of the 4th century B.C., Ceylon was colonised by Indo-Aryan mariners and emigrants who sailed from the deltas of the Indus and the Ganges, the earliest arrivals being those who came from north-western India. Before they established settlements in Ceylon, these mariners, whose business was trade, had doubtless made several coastal voyages to this Island and carried back its products, or the profits from those products, to their homelands. In B.C. 325, Onesicritus, the chief pilot of Alexander the Great, was told by the seafaring people of the Indus delta, who had long been acquainted with Ceylon, about the situation, the surroundings and the products of the Island. It is probable that the Indo-Aryans first learned of Ceylon from South Indian sailors, with whom they must necessarily have made earlier contacts and who, it is reasonable to suppose, could not have been ignorant of the existence of their large, island neighbour. In abandoning their homelands and journeying to settle in far-distant Ceylon, the southernmost limit of their then known world, the first Indo-Aryan emigrants took a step which was perhaps not irrevocable because the ships they travelled in could have taken them back if the enterprise failed. Prominent, probably first, among the reasons which urged them to choose Ceylon for their new settlement would have been a reliance, if not a sense of assurance, that they would not encounter resistance which they could not overcome from the peoples, whoever they were, who then inhabited Ceylon, as well as from others, like themselves, who were trading with the Island. A second vital consideration would have been the greater material gains that would accrue to them from the known riches of the new territory in pearls, precious stones and chanks : possibly, they were also aware of additional sources of wealth in ivory, elephants, tortoise shell and spices. A third important factor on which they would have relied would have been an abundance of water and cultivable land on which they could raise crops for their sustenance.

The Vijaya legend of the Ceylon Chronicles (itself a combination of various other legends) describes a voyage at the mercy of winds and currents

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Note.—The word " navy " is not used in its modern sense of warships exclusively. In ancient times, the merchant ship and the fighting ship were one. In Elizabethan England of the 16th century, the " Navy " meant " all English ships and all English seamen."

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ending in a fortuitous landfall on an auspicious day at the hitherto unknown and rich island of Ceylon. One of these legendary versions related by Fa Hsien[1] implies a progressive colonisation and is the least unreal of these stories, all of which are fabulous and were embellished with miraculous and supernatural elements when they came to be written many centuries later. What we may safely assume is that this was no haphazard adventure but that the first settlement of Indo-Aryans, who were an agricultural community, was an organised expedition to a known land, that regular communication was maintained thereafter with the homeland, and that the success of the pioneer settlement encouraged further waves of emigrants to follow. The distance by sea was about 1,500 miles and none but intrepid seamen in sea-worthy ships could have accomplished this succession of outward and return voyages.

The background of the Indo-Aryan settlers in Ceylon was, therefore, one of expertness in sea faring, namely, in the building of sea-going vessels, the efficient management and navigation of them on the ocean, the ability to make voyage of many days duration, and a knowledge of winds and currents : concomitantly, they would have been equally expert in the lesser skills of building and operating smaller craft for the Ceylon pearl and chank fisheries and of boats for the catching of fish for food. (A fish was the distinctive emblem of the independent dynasty of *Gāmaṇīs* who ruled over south-eastern Ceylon but lost their authority early in the 2nd century B.C.)[2]. Sea faring, in every aspect of its activities, was the *forte* of these earliest colonists of Ceylon and should have been the inherited skill of their descendants, the Sinhalese. In the reign of Devānaṁpiya Tissa (B.C. 246—206) the Sinhalese were still making long voyages because the king's envoys sailed to the Ganges and back with gifts for the Mauryan emperor, Asoka, and they repeated the double journey in the following year. The existence of active communication between Ceylon and the Mauryan empire (Asoka mentions Ceylon in his edicts) can scarcely be doubted. The return from voyages abroad, in one day, of seven ships to a port in Rohaṇa laden with valuable cargoes, is recorded in a semi-legendary story of the early 2nd century B.C.[3]

1. Fa Hsien's travels, H. A. Giles, London, 1953.
2. C. J. S. (G), II. 99, 100, 175, 176 ; Sir Paul Pieris Felicitation Volume, 66, 67.
3. M 11.20-39 : 18.6-8 : 19.1-8 : 22.60. Either the Sinhalese had no knowledge of the currents on the western coast of Ceylon or they had lost that knowledge when the story of Vihāradevī came to be written. It is said that she was cast adrift on the sea near the mouth of the Kälaṇi River and that the vessel was carried to a landing place in Ruhuṇa. This is impossible because the current is northward and not southward, and it is this northward current which accounts for the pattern of the lagoons on the west coast.

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Thereafter, Sinhalese sea power appears to have suffered eclipse. In the 3rd century B.C. and earlier there was active maritime trade between the Arabs and the Indians. Then, in the 2nd century B.C., the Greeks began to cut out the Arab intermediaries and to make coastwise expeditions themselves to India. The direct dealing stimulated trade between the West and India. The South Indian ports, too, began to be visited with increasing frequency by Western ships. A trade boom had begun. Great opportunities for acquiring wealth by the sale of the products of South India and Ceylon to these Western merchants presented themselves, and doubtless excited the cupidity of the rulers and governing classes of these regions. Early in the 1st century B.C., the great discovery was made of the use of the monsoons to sail direct across the Indian Ocean, and Greek and Roman ships came with regularity and in much greater numbers to South Indian harbours. The products of Ceylon were obtained by the Romans in South Indian ports to which they were conveyed in South Indian ships. During the period of about two and a half centuries preceding the second decade of the 2nd century A.C. (when Roman ships began to make regular visits to Ceylon and deal direct with the Sinhalese), the Sinhalese had only an indirect share in the flourishing trade with the West and were dependent on South Indian shipping and intermediaries for the transport and marketing of their valuable merchandise.[4]

This loss, in the second half of the 2nd century B.C., of their sea power which the Sinhalese had previously possessed in a high degree becomes, therefore, a very significant event in the early history of Ceylon. The only apparent reason for it is that the vast, new opportunities for highly profitable trade created by the advent of Western ships and merchants into South Indian waters led to a conflict between the Tamils and the Sinhalese for the control of Ceylon's lucrative export trade in those seas. The Tamils were numerically stronger than the Sinhalese but were probably less skilled in seafaring, although it is very likely that they had greatly increased their efficiency since the days when they had stood aside and allowed the Indo-Aryans to occupy Ceylon and acquire its riches. In the struggle for command of the sea which followed, the Sinhalese were vanquished. The invasions and conquests of Ceylon which took place early in the 2nd century B.C., first by the Damiḷas, Sena and Gutthaka, who are described as the sons of a ship's captain who brought horses to Ceylon, and soon afterwards by the Damiḷa, Eḷāra, appear to have bene the most crucial phases of this struggle. All three are described as bene-

4. "The Commerce between the Roman Empire and India," by E. H. Warmington, Cambridge, 1928; "Arab Seafaring in the Indian Ocean," by G. F. Hourani, Princeton, 1951.

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volent rulers, in marked contrast to later Tamil conquerors, and this benign foreign rule is consistent with a policy of achieeving commercial control and at the same time giving every encouragement to the subject people to increase their production of and profits from thrat icles of commerce. The final phase in the subjection of Sinhalese sea power, it may be conjectured, was the Pāṇḍyan conquest in the reign of Vaṭṭagāmaṇi Abhaya early in the 1st century B.C. To this time may be assigned the inscriptions at the capital, Anurādhapura, of a guild or corporation of Tamil householders whose leader was a ship's captain.[5]

The collapse of Sinhalese sea power and the capture of Ceylon's external trade by Tamil intermediaries were largely discounted about the year 125 when Roman ships began to sail into Ceylon harbours and to deal directly with the Sinhalese. Chinese ships were also trading direct with the Sinhalese at this time and Ceylon became eventually the entrepot of trade in the Indian Ocean. A resuscitation of Sinhalese sea power was no longer essential solely in her trade interests, because the Romans and the Chinese would have seen to it that their direct dealings with Ceylon were not interfered with by the Tamil navies : and the Sinhalese had no aggressive intentions nor any desire to extend their territory overseas. Moreover, the ancient sea faring skill of the Sinhalese had been lost for over 200 years and now survived as a memory, while the Tamils were actively engaged during that period in seaborne activities and had attained a high level of efficiency which they never lost thereafter.[6]

The *Cūlavaṁsa* states that Moggallāna I (491—509) " by instituting guards for the sea-coast, freed the Island from danger."[7] It may be that in this statement is to be perceived the beginning of the revival of Sinhalese sea power, for it did revive and became powerful once again in the reign of Parakkamabāhu I in the second half of the 12th century. In the 3rd, 5th and 7th centuries, particularly in the 7th century, Sinhalese princes with pretensions or claims to the throne crossed to South India and returned with Tamil mercenaries to wage war against the ruling monarch. Very probably these Tamil troops were transported in Tamil ships. The Chronicles say nothing of sea fights on these occasions nor of any attempted invasions being repulsed on the seas : the decisive contests were always on land. The silence of the Chronicles is not, however, sufficient ground for a conclusion that there were no naval encounters : it may well be that

5. J. R. A. S. (C. B.), XXXV, 54.

6. The theory of a struggle for sea power between the Sinhalese and the Tamils in the 2nd and 1st centuries B.C. and the victory of the Tamils is the outcome of a stimulating discussion with Mr. B. J. Perera.

7. Cul. 39.57.

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attempted invasions which were beaten off at sea were not recorded. Mānavamma (684—718), who put an end to civil war, secured the throne with the aid of a Pallava invasion force, given him by the Pallava king, which was conveyed across the seas in Pallava ships. Many of these Pallavas settled in Ceylon and examples still survive of their characteristic art and architecture. It is probable that the resumption of sea faring by the Sinhalese was given a powerful impetus at this time under Pallava guidance.

After the Pāṇḍyan conquest of 429 to 455, Ceylon was not invaded by the Tamils until the reign of Sena I (833—853), a period of nearly four centuries. The earlier conquest exposed the vulnerability of Ceylon from her lack of naval forces, and we have seen that remedial measures were initiated by Moggallāna I at the end of the 5th century. The naval build-up was apparently inadequate to resist the Pāṇḍyan invasion in the reign of Sena I, and this weakness appears to have been realised because it is stated that this king's successor, Sena II (853—885), " set up guards against every danger " and " made the Island hard to subdue by the foe."[8] The " foe " in this context means the Tamil enemy in South India, and the measures of security taken to render the Island " hard to subdue " must have included defence on the sea as well as on the invasion coast. The strengthening of sea power undertaken after the second Pāṇḍyan invasion was completed rapidly and efficiently, because Sena II was able to invade South India in 862.

In 862 and again in 915 Sinhalese expeditionary forces crossed the seas to the Pāṇḍyan kingdom. The first of these landings in Pāṇḍya was an invasion whose purpose was to dethrone the Pāṇḍyan king and replace him on the throne by a Pāṇḍyan prince who had sought the aid of the Sinhalese monarch, while on the second occasion the Sinhalese army fought as an ally of the Pāṇḍyan army against the Cōḷas. It could be assumed that on both occasions the Pāṇḍyans would have given all the naval assistance they could to ensure the safe transporation of the Sinhalese forces to Pāṇḍyan soil. There is ground for assuming, also, that Sinhalese sea power had now reached a stage when their navy was capable of playing an effective part in invasion operations. In the reign of Mahinda IV (956—972), attempts to conquer Ceylon were made by the Rāṣṭrakūṭa king, Kṛṣṇa III, and the Cōḷa monarch, Sundara Cōḷa : both these rulers appear to have invaded the northern part of Ceylon and to have been foiled in their plans for the conquest of the Island by the Sinhalese king.[9]

8. Cul. 51. 49-50.
9. E. Z. V. 107, 108.

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We do not know the extent of the contribution of the Sinhalese navy to this successful resistance.

The growth of Sinhalese sea power would undoubtedly have suffered a set-back during the Cōḷa occupation from 993 to 1070. It would appear, however, that a certain number of Sinhalese ships made good their escape from the northern ports to ports in Rohaṇa, because three of the princes who ruled Rohaṇa from 1029 to 1050 came from overseas and maintained overseas contacts, while Vijayabāhu, who became ruler of the principality in 1055, was able to engage in maritime commerce with Burma.[10] The strategy of blockade could not have been unknown, and the distances to be covered by the Cōḷa navy from their Ceylon bases to blockade the ports of Rohaṇa were comparatively short : nevertheless, the Cōḷas were not successful in preventing Vijayabāhu's foreign trade. In Vijayabāhu's final, successful campaign to expel the Cōḷas, the principal objective of the western column of his two-pronged attack was the great seaport of Mahātittha (modern Māntai) and it is likely that with the capture of this harbour several Cōḷa ships fell into his hands, together, probably, with the Sinhalese vessels which the Cōḷas were then using. The main purpose in capturing Mahātittha before the attack on Polonnaruva was delivered was to prevent the Cōḷas from escaping by sea to their homeland and to ensure that they could not be supplied or reinforced : a secondary purpose may have been to capture their shipping. Ceylon emerged from the Cōḷa conquest with a depleted and not a shattered navy. After Vijayabāhu's victory, he re-established overseas relations with Kāliṅga and Burma, and also made preparations at two seaports to embark an expeditionary force upon an invasion of the Cōḷa kingdom. He could not, therefore, have lacked naval resources.[11]

Save for an abortive attempt at conquest by an iu vader (Vīradeva of Palandīpa) whose identity is obscure,[12] Ceylon was free of external attack for a century following the expulsion of the Cōḷas. For some years there was a disastrous civil war which impoverished the country, but with the accession of Parakkamabāhu as ruler of Dakkhiṇadesa, an era of great prosperity was inaugurated. He increased the money resources of his principality by exporting precious stones.[13] The ports available to him at that time would have been the havens and anchorages between the mouth of the Kalā Oya and Kalutara. (Colombo was already a seaport in the

10. Cul. 58. 8-10.
11. Cul. 59. 29, 46 : 60. 5, 6, 34.
12. Cul. 61. 36-47.
13. Cul. 69. 33.

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10th century. Väligama in Mātara district was also a flourishing port and there were many merchants there " to whom their life and their money were dear," but Parakkamabāhu exercised no authority over it.)[14]

The first record in the Chronicles of a sea fight occurs in the course of the narrative relating to the war between Parakkamabāhu of Dakkhiṇadesa and Gajabāhu of Rājaraṭṭha. It has to be borne in mind, however, that much of the *Cūlavaṁsa* account of Parakkamabāhu is pure panegyric : there is a great deal of adulation and exaggeration, and successful skirmishes are made to appear as major victories. In the two naval engagements described, " many hundreds of ships " are said to have participated and " many thousands of men " to have fallen : this description is not to be taken literally. The fights were, in fact, a contest for the mastery of the Pearl Banks off the north-western coast. In the first conflict the Malaya-rāyara, a commander of Parakkamabāhu, advanced from Vālikākhetta (identified by Codrington with modern Vellāvela, near Battulu Oya) and captured Gajabāhu's fortress at Mallavāḷāna, a place in the vicinity of Puttalam or Kalpiṭiya. He then embarked his troops on ships and sailed to Muttākara (the Pearl Banks) where Gajabāhu's naval forces, who were in possession, offered resistance. The Chronicle says that he twice engaged Gajabāhu's ships and put them to flight, but it is clear from the sequel that he failed to wrest the control of the Pearl Banks because shortly afterwards Parakkamabāhu had to despatch another general to accomplish this task. This general, the Nagaragiri Mahinda, followed the same plan. He captured Mallavāḷāna (which had been retaken by Gajabāhu's forces), put to sea with his troops, fought a victorious naval action against Gajabāhu's ships and secured the control of the Pearl Banks : to consolidate and hold his gains, he built a fortress at the place named Pilavasu and garrisoned it.[15] Thus Parakkamabāhu deprived his opponent of one of the main sources of money revenue from external trade, and doubtless exploited that success by exporting pearls in addition to precious stones.

Parakkamabāhu united the whole of Ceylon into one kingdom in 1153. He certainly raised the military might of Ceylon to a level which it had never attained before, and his naval power was considerable, enabling him to carry out invasions of Burma and South India. The attack on Burma should more accurately be described as a massive, punitive raid rather than an attempt at conquest, but it was a naval enterprise of some magnitude. The provocation for the conflict between the two

14. Cul. 75. 45, 46.
15. Cul. 70. 60-65, 89-93.

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countries, between which there had long subsisted strong ties of friendship and cordial trade relations, is stated in detail in the *Cūlavaṁsa*.[16] In brief, the Burmese king, Alaungsithu, grown haughty and intolerant in old age, impeded and put a stop to the trade of Sinhalese merchants, especially the trade in elephants. He raised the prices of elephants to prohibitive levels, refused to make the customary exchanges, and then seized and imprisoned a group of Sinhalese merchants and confiscated their wares and their ships. Two Sinhalese envoys were sent back to Ceylon in a leaking vessel. On a later occasion he accepted payment from Sinhalese merchants for elephants and then refused to deliver them. The final act of aggression was the seizure of a Sinhalese princess on her way to Kamboja (Western Siam). The Sinhalese king resolved to make war and put in hand preparations for an invasion of Burma. The building of a fleet of vessels of various kinds was begun and " now all the country round about the coast was one great workshop occupied with the building of the ships." The work of shipbuilding was completed in five months and the fleet assembled at the port of Pallavavaṅka (identified by Codrington as Palvakki, about 24 miles northward of Trincomalee). The overall Commander of the entire naval and military force was the Damiḷādhikārin Ādicca, a dignitary whose peace-time duties were connected with the State Treasury, and next in command under him was the Nagaragiri Kitti (called Kit Nuvaragal in the Devanagala inscription). The fleet, it is stated, was provisioned with supplies to last one year. " Now when this assemblage of ships all at the same time sailed forth in the midst of the ocean it looked like a swimming island." Rough seas and adverse winds were encountered on the voyage and the ships became separated (a not uncommon event in the marine history of sailing ships). Some sank and others drifted to foreign shores. One ship made land at Kākadīpa (" Crow's Island "), probably one of the Andaman Islands, and the troops on board captured several of the inhabitants and brought them to Ceylon as prisoners. Five ships under the command of the Nagaragiri Kitti entered the port of Kusumīya (Bassein), where the troops landed, defeated the Burmese forces who opposed them and laid waste the surrounding countryside. The Damiḷādhikārin Ādicca landed at Papphālama and advanced and captured the town of Ukkama : it is claimed that his troops slew king Alaungsithu but this claim is not supported by the Burmese accounts of the death of their king. The Burmese now sent envoys to Ceylon to make a treaty with the Sinhalese king : whether these envoys preceded or accompained or followed the Sinhalese ships on their return journey is not dis-

16. Cul. 76. 1-75.

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closed. The *Cūlavaṁsa* account of the capture of Kusumīya by the Nagaragiri Kitti and the restoration of peace by a treaty negotiated by Burmese envoys is confirmed by the Devanagala inscription[17] of Parakkamabāhu I, dated in the year 1165, recording a grant of land to Kit Nuvaragal for his services in the Burma campaign.

If the *Cūlavaṁsa* narrative is construed literally, it would appear that only six troop-carrying Sinhalese ships reached Burma, the rest of the fleet having been scattered by the storms encountered at sea ; and the submission of the Burmese, which is said to have followed upon the victories gained by the troops from these six ships, can only be explained either by a lamentable state of unpreparedness for defence in the Burmese kingdom or by divided loyalties within it and the adherence of powerful factions, actively or passively, on the side of the Sinhalese. On the other hand, it is not improbable that the *Cūlavaṁsa* story of the subjugation of a foreign kingdom by six of Parakkamabāhu's ships is just another laudatory exaggeration of the marvellous power of its hero's arms.

Parakkamabāhu's next military expedition across the seas was the invasion of Pāṇḍya. The Cōḷa power was now declining, but it was not weak. In a succession dispute which arose in Pāṇḍya, the ruler, Parakkama, was besieged in his capital, Madhurā, by the claimant, prince Kulasekhara : Parakkama appealed to the Sinhalese for armed assistance, while Kulasekhara appealed to the Cōḷas. Parakkamabāhu of Ceylon responded to the Pāṇḍyan king's call and began to assemble at the seaport, Mahātittha, ships and troops under the command of the Senāpati Laṅkāpura : but before the expedition was ready to sail, news was received that Kulasekhara had captured Madhurā and slain Parakkama Pāṇḍya and his wife and children. The Sinhalese king repeated his orders to the Senāpati Laṅkāpura to proceed with the invasion, depose Kulasekhara and consecrate as king a scion of the house of the dead Pāṇḍyan king. The fleet with the troops on board thereupon set sail, the pre-selected landing place being the roadstead of Taladilla on the Pāṇḍyan coast. Since the ships could not stand in close to the shore at Taladilla, a large number of small boats was taken, probably in tow as well as slung over the sides, to transport the troops from the ships to shore. The crossing of the sea from Mahātittha to Taladilla took about 24 hours, a day and a night, and the landing was made successfully, as planned, in the face of Pāṇḍyan opposition : Taladilla was captured and established as a beachhead. The further course of the fighting, which was on land, is not relevant to this account of naval operations,

17. E. Z. III. 312-325.

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but it may be mentioned that further, important use was made of the Sinhalese navy to bring to Ceylon numerous Tamil prisoners of war captured by the Senāpati Laṅkāpura as well as to reinforce the general with a large contingent of fresh troops at a crucial stage in his campaign. The *Cūlavaṁsa* ends its account of the Pāṇḍyan invasion abruptly but on a note of victory.[18] From the Cōḷa inscriptions we know that the actual termination of this particular campaign was the defeat of the Sinhalese invading forces and the capture and decapitation of Senāpati Laṅkāpura and the other Sinhalese generals after the capture of Madhurā by them and a probably imprudent attempt to invade the Cōḷa kingdom which brought massive retaliation from the Cōḷas. But this was not the end of Parakkamabāhu's intervention in the affairs of Pāṇḍya. The Pāṇḍyan rulers were "time-servers who changed sides according to their estimates of their own immediate interests." But Parakkamabāhu's policy was consistent : he aligned himself with any Pāṇḍyan prince who was prepared to make war against the Cōḷas and in pursuance of this policy it happened that he subsequently supported princes whom he had previously fought against.

A Cōḷa epigraph of 1178 (approximately) states that news was received in the Cōḷa kingdom that the Sinhalese king, Parakkamabāhu, was building ships and assembling troops at Ūratturai (Kayts), Pulaiccēri, Mātōṭṭam (Māntai), Vallikāmam (Valikāmam), Maṭṭivāl (Maṭṭuvil) and other places in order to make a fresh invasion of South India : to forestall this, the Cōḷa king organised a counter-expedition, placing at its head prince Srivallabha of Ceylon, a nephew of king Parakkamabāhu, who was then a refugee in the Cōḷa country : this expedition landed in Ceylon, captured several places, including Pulaiccēri and Mātōṭṭam, seized many elephants, devastated a considerable area of land, killed or took captive some of the Sinhalese chieftains of the locality, and returned to the Cōḷa kingdom with the captured booty. Parakkamabāhu's invasion plans were thereby frustrated. Reading between the lines, we may infer that the placing of a Sinhalese prince at the head of this Cōḷa expedition was, if not an attempt to dethrone Parakkamabāhu, an endeavour to secure a foothold in the northern part of Ceylon with a view to extending the scope of the operations later : this plan was frustrated by Parakkamabāhu.

Sinhalese troops again crossed to Pāṇḍya about 1186 and fought on the side of the Pāṇḍyan faction which was at war with the Cōḷas. A Cōḷa inscription claims that the Cōḷa soldiers "cut off the noses of the Śingala troops who rushed into the sea." Parakkamabāhu died in 1186. His

18. Cul. 76. 76-334 : 77. 1-103.

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repeated interventions in Pāṇḍyan affairs would have imposed upon his navy the tasks of transporting the expeditionary forces and the reinforcements sent from time to time, supplying and provisioning these forces, bringing back the wounded and prisoners, maintaining uninterrupted sea communication, and, above all, preventing the Cōḷa navy from interfering with the seaborne operations. There is no reason to doubt that it was capable of performing these tasks, and did perform them, successfully.

Nissaṅka Malla (1187—1196), in more than one of his vainglorious inscriptions, claims to have invaded South India, received tribute from Pāṇḍya and Cōḷa without fighting and, returned to Ceylon with captives. The presence of an inscription of this king at Rāmēśvaram is evidence that he did cross to the Indian mainland with an army, but the rest of his claims receive no corroboration from any source. It is probable that he continued the policy of Parakkamabāhu I of sending Sinhalese troops to Pāṇḍya to aid the Pāṇḍyans against the Cōḷas.

After the death of Nissaṅka Malla, the Sinhalese kingdom of Polonnaruva moved rapidly to its collapse. Civil wars and invasions succeeded each other. There were at least four Cōḷa invasions between 1196 and 1210, and these were followed by a Pāṇḍyan conquest from 1211 to 1214. In these encounters the military power of the Sinhalese on land and sea was severely shaken : it was finally smashed in the second and third quarters of the 13th century by the conquests of the Kāliṅga, Māgha, and the Javanese, Candabhānu.[19]

The naval history of ancient Ceylon may, therefore, be briefly summarised as follows :—

(1) *Up to 3rd B.C.*—Expert skill and a great tradition in seafaring ; many voyages were made to and from the deltas of the Indus and the Ganges ; as sailors the Sinhalese were supreme in the South Indian seas.

(2) *2nd and 1st centuries B.C. and up to about the year* 125.—Rapidly increasing commerce between the West (Greeks and Romans) and South India led to a struggle between the Tamils and the Sinhalese for the mastery of the South Indian seas in order to gain control of Ceylon's rich export trade, and in this struggle Sinhalese sea power was vanquished in the 2nd century B.C. ; thereafter, the products of Ceylon were transported to and sold in Tamil ports

19. For the Cōḷa inscriptions, see " The Cōḷas," by K. A. Nilakanta Sastri, 366-372, 378-385, 412, 423, 424 ; J.R.A.S. (C.B.), XXXI, 384-387. For Nisssaṅka Malla and his successors, see Cul. 80. 1-80 : 81. 1-21 : 82. 1-27 : 83. 1-48 ; E.Z. II. 190-192 : IV 82-88 : V. 152-158, 170-173 ; J.R.A.S. C.B.), New Series, V, 173-182.

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by Tamil intermediaries to Western merchants ; perhaps, only Chinese ships had regular dealings in a small way direct with the Sinhalese.

(3) 125 *A.C. to the 4th century.*—Roman and Chinese ships were calling regularly and in increasing numbers at the ports of Ceylon and dealing direct with the Sinhalese, eliminating the Tamil intermediaries, and this direct trade expanded to such dimensions that Ceylon became the entrepot of trade in the Indian Ocean ; the necessity for a Sinhalese navy for protection of trade or for defence or for territorial expansion (which the Sinhalese never contemplated) did not exist.

(4) *The 5th century.*—The Pāṇḍyan conquest emphasised the necessity for a revival of Sinhalese naval power, and the first steps were taken by Moggallāna I.

(5) *The 7th and 8th centuries.*—Under Pallava guidance the resuscitation of Sinhalese sea power made further progress.

(6) *The 9th and 10th centuries.*—After the Pāṇḍyan invasion in the reign of Sena I, the Sinhalese naval build-up was greatly expedited, and in 862 and 915 the Sinhalese navy was capable of transporting Sinhalese armies of invasion to Pāṇḍya and maintaining those armies in the invaded territory.

(7) *The 11th century.*—Sinhalese sea power was not seriously incapacitated during the Cōḷa conquest, and recovered rapidly after the expulsion of the Cōḷas.

(8) *The 12th century.*—Sinhalese naval power reached its peak, enabling Parakkamabāhu to carry out an invasion of Burma and to send a succession of expeditionary forces to South India ; the Sinhalese navy was able to keep the Cōḷa navy in check.

(9) *The 13th century.*—Destruction of the naval and military power of the Sinhalese.

Neither the name nor the title of a Sinhalese naval commander, corresponding in rank to an Admiral, is mentioned in the Ceylon Chronicles. There was, in fact, no such post, because the ships were not exclusively warships and for the greater part of the time were employed as merchantmen : moreover, many of them were privately owned, though the king had, no doubt, the power to requisition them for war service whenever necessary. In every Sinhalese expedition overseas, the overall commander of the ships and the troops was always the commander of the land forces : but in no instance is the king or a prince mentioned as having left Ceylon

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in command of an expeditionary force. Sinhalese kings and princes commanded troops in the field within their own kingdom, but not abroad.

Of naval strategy and tactics the Chronicles say practically nothing. No doubt, Indian methods and techniques were borrowed, but there again we know almost nothing of Indian naval warfare.

POSTSCRIPT

Professor Paranavitana's theory, first propounded at the Dambadeniya Cultural Conference on August 23, 1958, that Māgha, and by implication, presumably all the other Kāliṅga kings of Ceylon, were members of the Kāliṅga royal house of the Srivijaya kingdom of Malaya and Indonesia, has a vital bearing upon the history of Sinhalese sea power as well as resolves certain historical problems of the 10th to 13th centuries.[20] Mahinda IV (956—972) was the first Sinhalese king to make a marriage alliance with this Kāliṅga royal house of South-east Asia, and the *Cūlavaṁsa* employs significant words in narrating the event :— "Although there was also in Laṅkā a race of nobles, the ruler of men (Mahinda IV) had a princess of the land of the ruler of Kāliṅga fetched and made her his first Mahesī. Of her were born two sons and a charming daughter. He made his sons Ādipādas and his daughter a Queen : thus the Ruler found the royal house of the Sīhalas."[21] Mahinda V, son of Mahinda IV by the Kāliṅga Mahesī, describes himself in an inscription as "a pinnacle of the Kāliṅga royal house."[22] Vijayabāhu I, after he restored Sinhalese sovereignty over Ceylon in 1070, married a Kāliṅga princess as his second Mahesī, and by her he had a son, Vikkamabāhu, who also married a Kāliṅga princess. The grandmother of Parakkamabāhu I (1153—1186) was the Kāliṅga Mahesī of Vijayabāhu I. Parakkamabāhu's sister married a Kāliṅga prince and their son, Vijayabāhu II, was nominated as Parakkamabāhu's successor. Thereafter, the following kings of Ceylon were of pure Kāliṅga descent :— Nissaṅka Malla (1187—1196) ; Vīrabāhu (1196) ; Vikkamabāhu III, also called Erapatta[23] (1196) ; Coḍagaṅgā (1197) ; Sāhassamalla (1200—1202) ; Queen Kalyāṇavatī, Mahesī of Nissaṅka Malla (1202—1210) ; Lokissara or Lokēśvara (1210—1211) ; and finally Māgha (1214—1239).

20. The writer was aware earlier of Professor Paranavitana's views on this subject, but was precluded from making use of them till they were made public. That is the reason for introducing them now as a postscript.
21. Cul. 54. 9-11.
22. E. Z. IV. 65.
23. E. Z. V. 161.

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The Srivijaya kingdom of South-east Asia possessed immense sea power : they colonised Madagascar and their only competitors in the Indian seas were the Cōḷas. The conquest of Pāṇḍya, Ceylon's closest neighbour on the Indian continent, by the warrior Cōḷa king, Parāntaka I (907—955), and the rapid expansion of the might of Cōḷa arms, both on land and sea, would have made it very evident to the Sinhalese that alliances with other kingdoms on the Indian mainland who were enemies of the Cōḷas would be of little avail in averting their own, impending subjugation. The Sinhalese, therefore, looked eastward to Srivijaya, with its great naval resources, for the aid they would need, and the marriage of Mahinda IV to a princess of the Kāliṅga royal house of that kingdom appears to have been arranged with this political end in view. All the assistance which any kingdom on the Indian mainland could have given the Sinhalese against the Cōḷas would have been purely diversionary assistance which could not be depended upon to be either well-timed or sufficiently massive ; none of these kingdoms was capable of reinforcing the Sinhalese army with troops transported across the ocean nor of breaking nor even seriously impeding the Cōḷa navy's command of the South Indian seas. The only material aid that could benefit the Sinhalese was naval aid and the only power that could give that aid was the Buddhist kingdom of Srivijaya in South-east Asia ruled by the Kāliṅga dynasty : without that aid a Cōḷa invasion and blockade of Ceylon would achieve complete success, both in its military and economic aspects.

The wise policy of Mahinda IV bore fruit. We have seen that during the Cōḷa occupation of northern and north-central Ceylon, Vijayabāhu of Rohaṇa was able to engage in sea-borne commerce with further India in spite of the Cōḷa blockade, and this external trade, which enabled him to build up his resources for fighting the Cōḷas, was doubtless facilitated, if not protected, by the Srivijaya navy. After his victory, Vijayabāhu I had no lack of sea power. The ports on the eastern and southern coasts, particularly Trincomalee, would have increased in importance after the alliance with the Malays : we find Koṭṭhasāra (modern Kōṭṭiyār, in the Bay of Trincomalee)[24] mentioned twice as the port of escape overseas for defeated Sinhalese princes of Kāliṅga descent,[25] and Väligama, in Mātara district, a flourishing seaport in the 12th century.

The naval might of the Sinhalese in the reign of Parakkamabāhu I has already been described. There is little reason to doubt that here again

24. The identification is by Professor Paraṇavitana.
25. Cul. 61. 43 : 70. 305.

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the Sinhalese owed much to the Malays, and it was probably this obligation that influenced the selection of Parakkamabāhu's nephew, the son of a Kāliṅga prince, as his successor on the throne of Ceylon.

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Secular Fluctuations in the Rainfall Climate of Colombo

INTRODUCTION

THE demonstration of short-period (decadal and poly-decadal) climatic fluctuations using evidence from climatic 'indicators' such as glacier regimes, varve chronologies, tree-rings, lake-levels etc., has been substantiated by analyses of instrumentally recorded meteorological data. Such investigations, while being numerous from mid and high latitudes, are but meagre in respect of tropical areas. Perhaps the more notable recent studies of tropical secular changes are those for Mexico[1] and the more integrated study[2] covering the tropical area as a whole. The latter made yet another contribution,[3] attempting to bring out the relationship between the monsoonal circulation (with its incidental rainfall) and the zonal circulation.

The rainfall data used in this study covers the period 1870—1952 with interruptions in 1936 and 1942. The site of the station—Colombo Fort (6° 54' N.L. ; 79° 52' E.L.) has remained unchanged since 1870. But the rain-guage has been shifted twice ; in 1936 it was moved from its roof-position to the ground and subsequently in November 1942 it was replaced on the roof. However, the gauge remained in the same position on the roof from 1870 to 1935 and would therefore present a homogenous record. In 1910 the headquarters of the Ceylon Meteorological Department was moved to a new site (the pesent Colombo Observatory) a short distance away. Since 1911 observations were made from both sites up to the present day. A comparison of the 1911—1952 data of rainfall at both stations show (Fig. 2*a*) that though the amounts naturally differ (being lower at Colombo Fort in view of the elevated position of the gauge) the fluctuation-patterns are similar. A recent study[4] using the roof-position gauge data for Bristol did not seem to affect the fluctuation-trends demonstrated for that region.

1. C. C. Wallen, " Climatic Fluctuations in Mexico," *Geogr. Ann.*, 37 (1955), pp. 57—63.
2. E. B. Kraus, " Secular Changes of Tropical Rainfall Regimes," *Quart. Jour. R. Met. Soc.*, 81, (April, 1955), pp. 198—210.
3. E. B. Kraus, " Secular Changes of the Standing Circulation," *ibid.*, 82 (July, 1956), pp. 289—300.
4. F. G. Hannell, " Climatic Fluctuations in Bristol," *Adv. Sci.*, XII, 48 (March, 1956), pp. 373-386.

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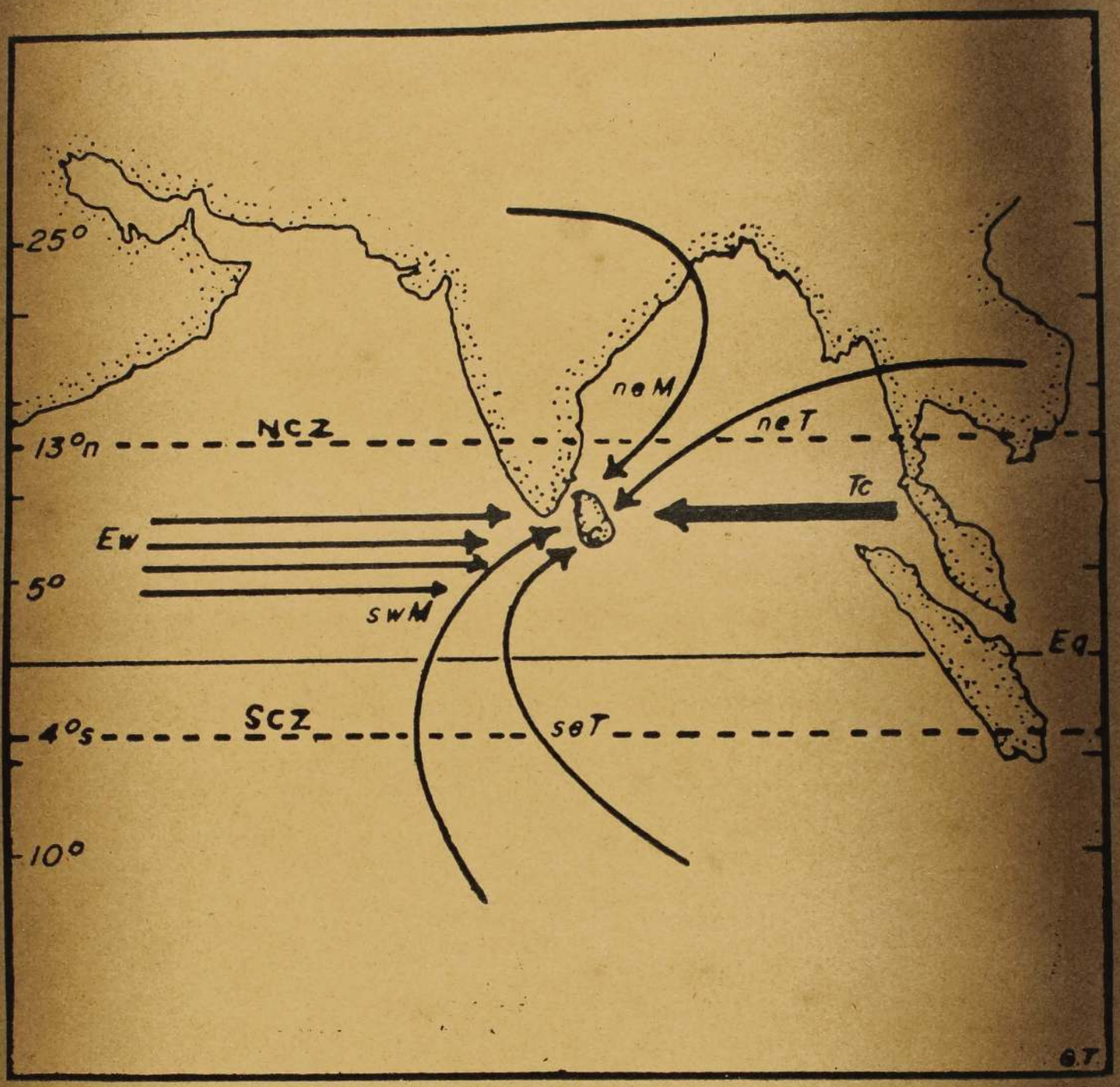

Fig. 1 Climatic "controls" in Ceylon.

Ew	equatorial westerlies
neT	northeast trades
seT	southeast trades
neM	northeast monsoon
swM	southwest monsoon
Tc	tropical cyclones
NCZ	northern convergence zone
SCZ	southern convergence zone.

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Rainfall Characteristics

Colombo (Fort) is situated on the west coast of Ceylon and is therefore subject to the diurnal sequence of alternating land and sea breezes throughout the year, except from June to mid-September, when the SW monsoon dominates the climatic scene ; the seasonal counterpart,—the NE monsoon (December to February) is of less relative significance to the rainfall of Colombo (Fig. 1). It has become an unfortunate habit for rainfall in Ceylon to be immediately associated with the monsoons ; an attempt[5] was recently made to clear this misconception. A detailed analysis[6] of the nature and incidence of rainfall in Ceylon has already been made; however, it would not be irrelevant at this stage, to outline briefly the main rainfall features of Colombo.

The analysis is best begun in March, which marks the initiation of the 'climatic year' in Ceylon[7] ; this is the equinoctial period and the island is suited for convectional activity. The diurnal sequence of clear mornings and afternoon thunderstorms at Colombo, is interrupted only when the northern convergence zone (NCZ) is active over the island to produce rapid deterioration of weather at any time of day. If the NCZ (Fig. 1) is at some distance from Ceylon, then widespread stratiform and high clouds with occasional rain will be the main features. When the island comes within the zone of the equatorial westerlies (EW) i.e., the intertropical convergence zone (ITCZ), ideal conditions prevail to permit intense convectional activity ; it is then that markedly unstable conditions over inland valley locations provide the impetus for cumuli development. The cumulo-nimbus clouds then move towards the coast (with the setting-in of the land breeze) releasing sudden thundershowers in the process ; in April these features are accentuated. In May however, these conditions are wont to change ; while the still persistent convectional circulation vies *pari passu* with the weak and nascent monsoonal currents trying to gain control, the weather is generally variable. The NCZ may yet persist in the island's vicinity, so as to even inaugurate the SW monsoon ; the latter prevails from June to mid-September, with an all-day rain tendency. October and November are months of convectional-convergence weather, when the equatorward returning NCZ passes over the island. However,

5. G. Thambyahpillay, "Thunderstorm Phenomena in Ceylon," *University of Ceylon Review*, XII (July, 1954) pp. 164—176.

6. Thambyahpillay, "Rainfall Rhythm in Ceylon," *ibid* XII (October, 1954), pp. 224—273.

7. Thambyahpillay, "Climatic Controls in Ceylon" *ibid.*, XI (July-October, 1953), pp. 171—180.

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the heavy and highly variable rainfall so characteristic of October—November months in particular, can be attributed to the frequent incursions of cyclonic and depressional storms, from the Bay of Bengal area (Fig. 1). The NE monsoon prevails from December to February, though convectional activity is clearly evident at Colombo.

The annual average (1871—1940) rainfall amounts to 81.20 inches. The data for the period 1941—1952 has been omitted in computing the average, in view of interruptions in the record due to shifting of the gauges. The SW monsoonal period rainfall amounts to 20.42 inches which is only 25 percent of the total. At the onset of the monsoon in June, Colombo and western coastal stations receive heavy rain because the currents are yet at surface level, but by July when the monsoon is fully established, and the currents are flowing at higher levels, the 'lifting agency' so necessary to induce the moisture to be deposited, is provided by the western flanks of the Highland, lying athwart the monsoonal currents.[8] The NE monsoon rainfall of 10.60 inches (13 percent of total) is low because unlike the SW monsoonal currents, those of the NE counterpart, are weak, modified NE trades and impinge upon the island along a broad zone; by the time they reach Colombo little moisture is left and often local convectional currents are responsible for much of the rainfall. It is however, not often realized that the rainfall received during the convergence-convectional periods, amount to as much as 38.74 inches which is nearly 48 percent of Colombo's total.

Techniques of Analysis

(i) *Moving Averages Curves*

The method of moving averages, or otherwise termed "overlapping" or "running" means, has now come to be adopted as almost a *sine qua non* in investigations of climatic fluctuations. By this technique, the attempt is made to 'smoothen' the highly irregular components of the graph, in the plotting of which only the single values have been empolyed. It is assumed that these irregularities are incidental and therefore tend to mask the main features of the graph. The process of smoothing tends to diminish the incidental deviations in proportion to the length of the available period. The resulting graph would then take on a firmer and more harmonious outline.

The method consists, as is well-known, of computing the consecutive and overlapping mean values, e.g., for 10-year means of 1881—1890, 1882—1891 1883—1894, etc., and then plotting these values in a graph against the

8. Thambyahpillay, "Rainfall Rhythm.....", *op. cit.*

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middle values, thus, 1885+, 1886+, 1887+, etc. In adopting this sequence, it is natural that on the moving average curve, the maxima and minima are displaced from the maxima and minima respectively, of the non-overlapping means. Nevertheless, the graph so obtained by such a simple smoothing process, does give a good and detailed representation of the fluctuations that have taken place, thereby revealing 'hidden' trends. In the choice of the time-interval to be adopted for smoothing, consideration must be given to the approximate periodicity of the 'trend' that is hoped to be revealed ; for, if the time-interval chosen is too short, then the means would be affected by the incidental deviations but, on the other hand, if the time-interval is too long, then the 'periodicity' may be suppressed. In this study, the 10-year period has been used in the light of suggestions made by experienced investigators.

Despite these advantages, two serious shortcomings are inherent in using this technique, namely :—

(*a*) Since each of the values plotted represents the mean for a number of years, the resulting graph obscures the precise date of each phase change. Thus, a climatic fluctuation setting suddenly would be represented by a smooth variation.

(*b*) When using a short time-interval for the means, it is possible that a single extreme term in a series may have a marked effect on successive values and would thus indicate a fluctuation, which is purely fictitious.

In view of these disadvantages, the moving averages curves are used in the present investigation in conjunction with residual mass curves.

(ii) *Residual Mass Curves*

Residual mass curves were first employed in the investigation of hydrological problems, especially in connection with the determination of excess or deficit of stream flow over a prolonged period. This technique was adopted in investigations of climatic fluctuations, pioneered by the engineers Keele and Barnes.[9] More recently, the effective use of this method has been demonstrated in the investigations of climatic fluctuations.

The residual mass curve, in effect represents cumulative deviations from the mean. In compiling this curve, the value of each year is first expressed as a deviation (plus or minus) from the mean. The value to be plotted against an individual year is then obtained by the simple algebraic summation of all the separate deviations which had occurred up to that year inclusive. In this graph, therefore, upward-or downward-trending curves would indicate positive (increasing) or negative (decreasing)

9. A. A. Barnes, "Rainfall in England : The True-Long Average as Deduced from Symmetry," *Quart. J. R. Met. S.*, 45 (1919), p. 209.

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TABLE I

Percentage deviations from average (1871—1940) of the Annual and Monsoonal Rainfall at Colombo during 1870—1952.

Year	Annual	SW Mon.	NE Mon.	Year	Annual	SW Mon.	NE Mon.
1870	+ 12.51	— 36.45	— 26.89				
1871	— 21.37	— 40.88	— 18.21	1911	— 28.25	— 47.43	+ 6.98
1872	— 36.33	— 37.33	— 46.41	1912	— 0.50	+ 0.63	+ 7.16
1873	— 13.79	— 46.21	+ 2.35	1913	— 7.21	— 30.53	+ 17.45
1874	— 36.45	— 56.53	— 71.24	1914	— 31.83	— 30.07	— 23.49
1875	— 3.41	+ 12.29	— 29.71	1915	— 5.68	— 1.42	— 74.90
1876	— 0.67	— 55.06	— 40.19	1916	+ 3.01	+ 24.97	— 29.52
1877	+ 32.92	+119.46	+165.84	1917	— 23.32	— 19.61	— 2.16
1878	+ 72.04	+264.25	+ 1.60	1918	— 28.25	— 61.45	— 41.03
1879	+ 3.84	— 27.53	+ 51.23	1919	— 9.10	+ 2.94	— 12.45
1880	— 12.07	— 72.27	— 27.45	1920	— 14.39	— 19.76	+ 15.37
1881	+ 10.92	— 10.47	+ 41.13	1921	— 41.18	— 62.53	— 56.50
1882	— 1.93	+ 17.60	+ 15.90	1922	— 15.84	— 41.19	— 13.39
1883	+ 27.59	+ 77.13	— 21.88	1923	+ 9.00	+ 63.47	+ 37.36
1884	+ 1.15	— 20.64	+ 58.39	1924	+ 14.76	+ 48.32	— 9.62
1885	+ 5.39	+ 45.57	— 14.90	1925	+ 24.75	+ 24.68	0.00
1886	+ 7.15	+ 27.82	— 35.28	1926	+ 5.20	+ 74.58	+ 10.37
1887	+ 3.46	— 30.72	— 3.11	1927	— 5.35	— 11.06	— 1.88
1888	+ 24.45	— 29.20	+ 23.49	1928	+ 3.92	— 20.20	+ 70.09
1889	+ 33.80	+ 94.19	— 1.60	1929	— 4.58	+ 16.32	+ 16.32
1890	— 10.34	— 63.52	+ 20.00	1930	+ 22.85	— 22.07	— 20.09
1891	+ 46.58	+ 0.54	+ 92.16	1931	+ 11.80	+ 72.41	+ 17.54
1892	— 25.08	— 47.29	— 18.49	1932	+ 34.53	+ 4.42	+ 13.39
1893	+ 10.43	— 20.30	— 31.41	1933	+ 16.21	+ 64.79	+ 24.33
1894	— 4.60	— 27.82	— 14.52	1934	+ 17.27	— 16.22	— 61.32
1895	+ 13.58	— 4.03	+ 20.00	1935	+ 5.60	+ 18.87	+ 20.94
1896	+ 24.48	+ 40.41	+ 62.73	1936	+ 5.48	— 15.43	+104.34
1897	+ 1.88	+ 42.82	+ 24.43	1937	+ 11.24	+ 5.85	+ 20.37
1898	+ 26.98	+ 22.71	+ 21.84	1938	— 27.48	— 39.97	+ 8.02
1899	— 9.50	— 38.83	— 17.07	1939	— 4.40	+ 7.03	— 81.88
1900	+ 3.42	+ 27.58	+ 94.90	1940	— 12.51	— 9.98	— 30.18
1901	— 4.40	— 27.04	— 6.41	1941	— 0.91	+ 21.38	+ 32.88
1902	+ 46.18	+ 25.02	+ 37.16	1942	— 19.16	— 25.71	+ 84.45
1903	— 2.22	+ 27.97	— 5.66	1943	+ 6.15	— 14.50	+ 61.15
1904	— 5.64	+ 1.17	— 15.38	1944	— 4.00	— 15.63	— 71.22
1905	— 19.27	+ 16.32	— 28.11	1945	— 7.19	— •0.49	— 43.37
1906	— 11.88	— 31.21	— 38.21	1946	+ 19.35	— 4.12	
1907	— 13.02	— 0.34	— 33.39	1947	?	?	— 19.43
1908	— 28.06	— 48.86	— 64.63	1948	— 16.93	— 2.80	— 25.94
1909	— 18.55	+ 10.66	— 69.90	1949	+ 9.74	— 0.34	+ 49.43
1910	— 43.73	— 51.03	— 12.36	1950	— 10.16	— 13.66	+ 1.60
				1951	+ 14.23	+ 46.20	+ 23.39
				1952	— 19.91	— 40.80	?

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tendencies, respectively. Hence, a "wet" phase would be represented by an upward-trending curve and a "dry" phase by a downward curve. Since the graph is unsmoothed, it would be formed of irregular components, and this would enable the location of the dates of phase-changes easily. Furthermore, in addition to the general 'trends' clearly evident, every single anomaly would be represented on the graph. Thus, on an upward curve, a single exceptional year of negative anomaly would be seen as a kink ; this special feature thereby serves to emphasize the fact that climatic phases do incorporate exceptional years.

In order to facilitate comparisons of the seasonally differing regimes of rainfall, all residual mass curves used in this study have been compiled from deviations expressed as percentages of the mean.

Rainfall Fluctuations

(*a*) *Annual trends*

The pattern of the annual fluctuations is represented by curves of moving averages (Fig. 2*a*) as well as by residual mass curves (Fig. 3). Even a cursory examination of the moving averages graph brings out quite unmistakeably the fluctuation-pattern of the rainfall climate. The curves bear evidence of positive and negative anomalies ; these anomaly-curves representing "wet" and "dry" rainfall phases, seem to conform to a definite phase—pattern. It is thus seen, that by the 1880s the rainfall has certainly recovered from a previous "dry" phase ; the "wet" phase on the other hand seems to have been inaugurated by the abnormally heavy rainfall of the years 1877 (108 inches) and 1878 (140 inches). These values, in fact, represent as much as over +36 and +76 percent, respectively. That the two decades 1881—1900 were years of positive rainfall anomalies can be realized from Table 1 as well as from Table IIA.

From the beginning of the present century, until about the mid-1920s, there had been a tendency for low rainfall as seen in Fig. 2a and Table 1. Thus, during the period 1903 to 1922, there was only a single year (1916) of positive rainfall anomaly and which amounted to only 3.01 percent. This phase was notable in Ceylon for continuous drought periods ; this is seen from Table IIB showing those years with nearly or more than 20 percent negative anomalies.

The next "wet" phase, is again clearly evident by the upward trending curve (Fig. 2*a*) since 1922 ; positive anomalies are therefore increasingly evident (Table. 1). This trend continued upto the 1940s and the average

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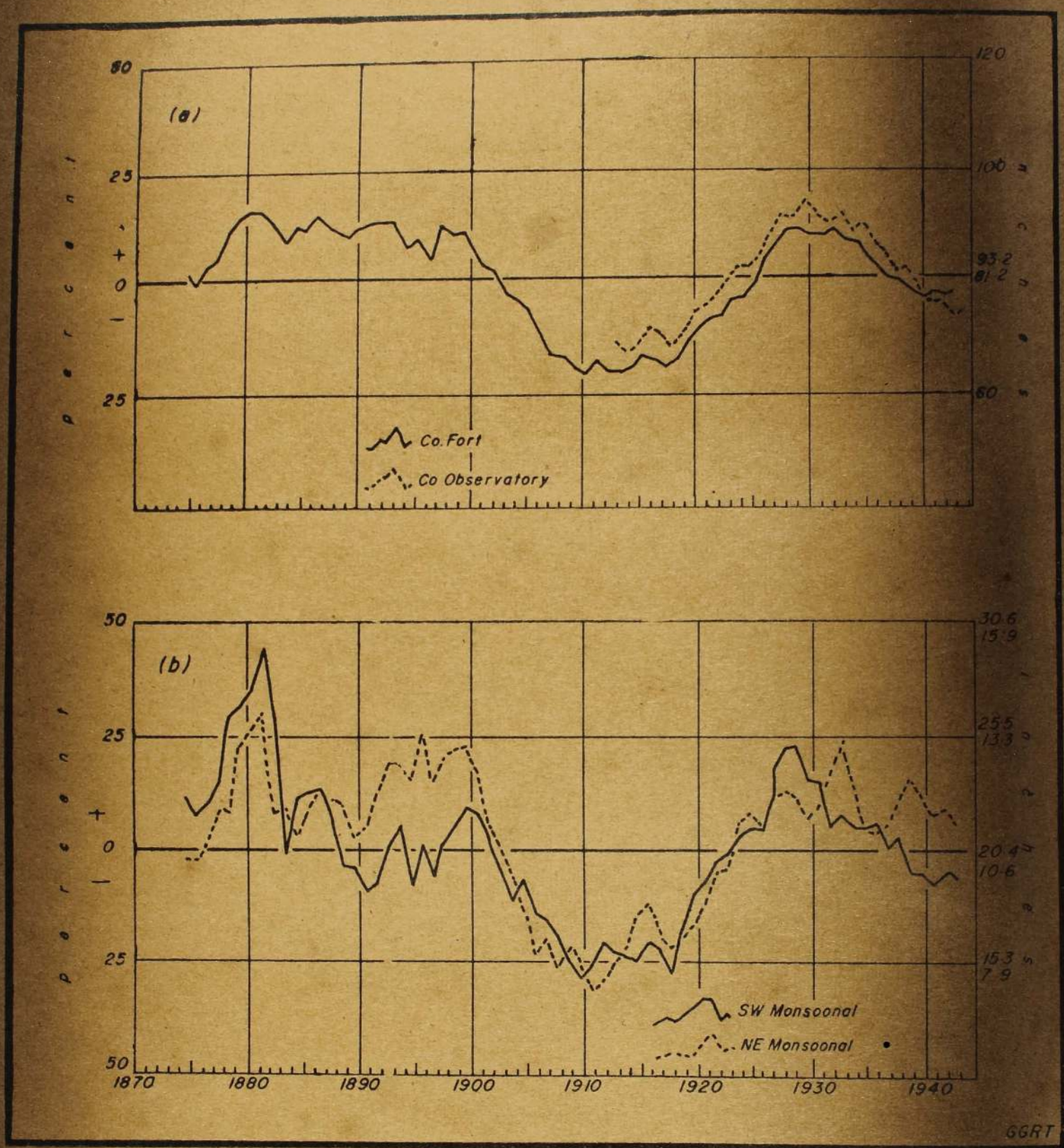

Fig. 2 (*a*) Ten-year moving averages curve of annual rainfall at Colombo Fort. The corresponding curve for the Colombo Observatory is also indicated.

(*b*) Ten-year moving averages curves of SW and NE monsoonal rainfall at Colombo Fort.

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value for the period 1944—1952 indicates the tendency for deficient rainfall. In view of the incompleteness of the data and interruptions of records, the graph is not continued after 1944.

TABLE IIA

Years of Heavy Annual Rainfall During 1881—1902.

Year	Amount (inches)	Percentage deviations from average
1883	103.6	+ 27.59
1888	101.1	+ 24.45
1889	108.1	+ 33.80
1891	119.0	+ 46.58
1896	101.1	+ 24.45
1898	118.7	+ 46.18
1902	118.7	+ 46.18

B

Years of Low Annual Rainfall During 1903—1925

Year	Amount (inches)	Percentage deviations from average
1905	65.5	— 19.27
1908	58.4	— 28.06
1909	66.1	— 18.55
1910	45.7	— 43.73
1911	58.3	— 28.25
1914	55.3	— 31.83
1917	62.3	— 23.32
1918	58.3	— 28.25
1921	47.8	— 41.18

The evidence for alternating " wet " and " dry " rainfall phases, is further substantiated by the residual mass curves (Fig. 3). The upward and downward curves indicate positive and negative rainfall tendencies or " wet " and " dry " phases, respectively. It is seen (Fig. 3) that during the upward-trending curve from 1877—1902, representing a " wet " phase, the deficient rainfall years of 1890, 1892 and 1901 are indicated as kinks on the curve. The other upward (" wet ") and downward (" dry ") curves also bring out these features ; the " wet-dry " phases correspond to those shown by moving averages graph.

A statistical presentation of the annual data in respect of 10-year and 20-year periods, brings out the interesting feature of approximate 20-year phases (Table III) in the rainfall climate, reflecting " wet-dry " phases.

(*b*) *SW monsoonal trends*

The techniques used in analysing the annual rainfall data are applied to the SW monsoonal period rainfall as well. It is again seen (Fig. 2*b*)

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that in 1877, the " wet " phase was inaugurated, recovering from a previous " dry " phase ; this recovery is marked by the heavy monsoon rainfall of 44.60 inches (1877) and 74.09 inches (1878), which correspond to over +119 and +264 percent, respectively of the average. These anomalies are the highest recorded in Colombo since observations were begun ; it is now known that during this period Ceylon and peninsular India (south of Madras) experienced one of the most violent cyclones[10] recorded in this area. The smoothed curve shows in general above average rainfall up to the turn of this century but shows deficient rainfall since then and continuing up to the 1930s. It is seen from Table 1, that deviation values are higher than those shown for annual values ; this is due to the smaller mean value of SW monsoonal rainfall (20.42 inches). This would also explain the larger minor fluctuations seen on the monsoonal curves; it has been shown[11] that occasional depressional activity and " monsoon surges," increase the rain potentiality of this period. Since 1902, drought incidence during the monsoonal period was high, as evident here from the high percentage negative rainfall anomalies of forty-nine (1908), fifty-one (1910), forty-seven (1911), sixty-one (1918), sixty-two (1921), and forty-one (1922). As shown by the annual rainfall curves, it is not until 1923 that recovery takes place and again the " dry " phase is indicated only in the early 1940s. The above trends are further demonstrated by the residual mass curve (Fig. 3). Here again, the data may be analysed into 10-year and 20-year 'wet-dry' phases (Table IV).

TABLE III

10-Year and 20-Year percentage deviations of Annual Rainfall from Average (1871—1940) at Colombo

A. 10 year		**B.** 20 year	
1871—1880	— 1.53	1881—1900	+ 9.50
1881—1890	+ 10.18	1901—1920	— 12.31
1891—1900	+ 8.81	1921—1940	+ 3.56
1901—1910	— 10.07		
1911—1920	— 14.54		
1921—1930	+ 1.35		
1931—1940	+ 5.77		
1941—1950	— 2.45		

(*c*) *NE monsoonal trends*

In computing the NE monsoonal rainfall it was necessary to overlap the years ; in other words, the 1870 value corresponds to the rainfall of December 1870, and those of January and February of 1871, and so on.

10. J. Eliot, *India Meteorological Memoirs*, Vol. IV, Part IV (1887).
11. Thambyahpillay, " Rainfall Rhythm....", *op. cit.*

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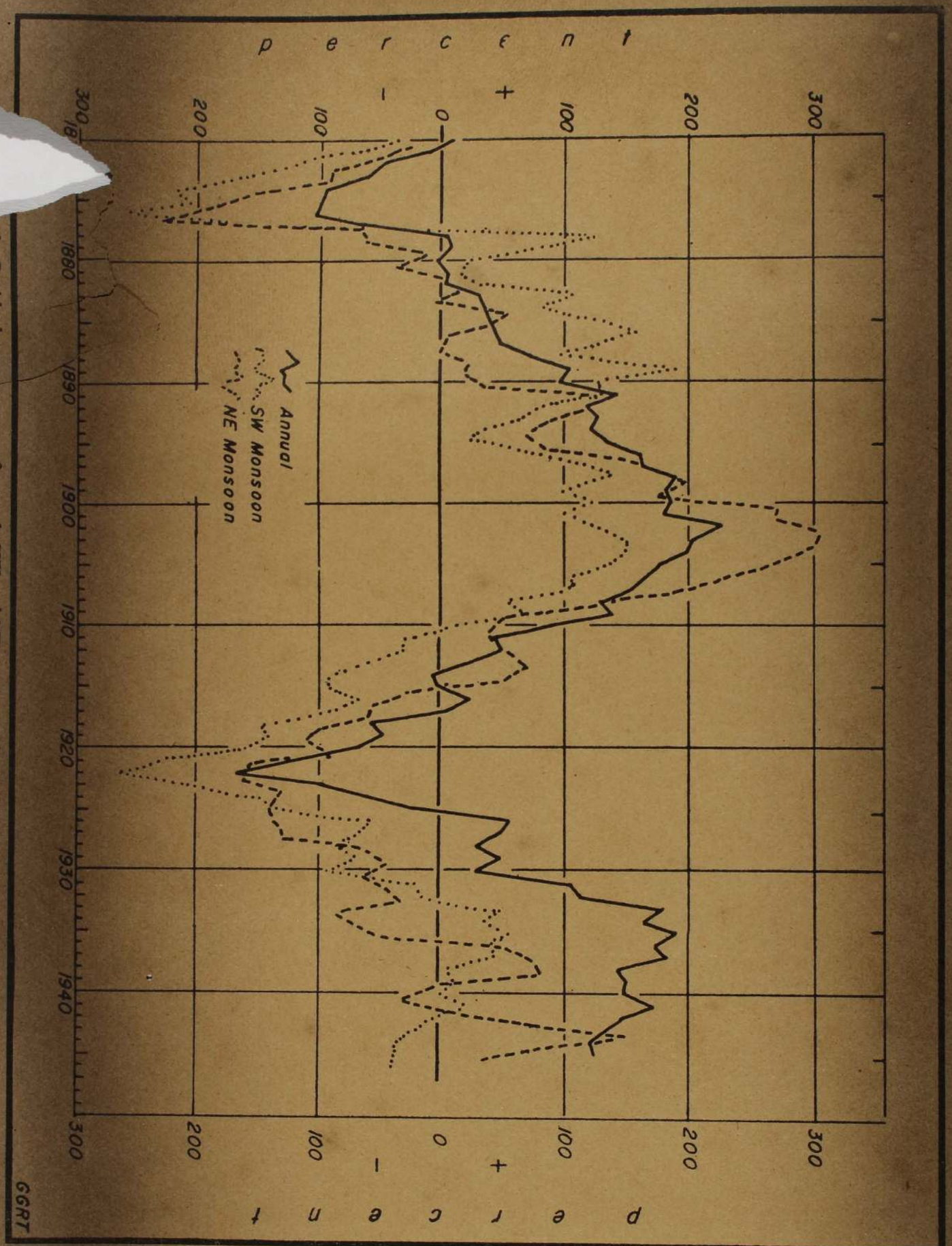

3 Residual mass curves of annual, SW and NE monsoonal rainfall at Colombo Fort.

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The monsoon is inaugurated in December[12] and continues into the following year. As in the earlier analyses, the "wet" and "dry" phases are discernible in both the graphs (Fig. 2*b* and 3). As is to be expected, however, the percentage values are unduly exaggerated in view of the low rainfall of 10.60 inches. Occasional incidence of cyclonic and depressional storms during these months, cause further positive rainfall anom[illegible] Thus, the post-1940 annual values (Table 1) show abnormally [illegible] values due to cyclonic incidence, in the December rainfall of 1941, 19[illegible] and 1943. Again in 1949 and 1951, the Januarys experienced cyclonic rainfall[13]. Despite these anomalous features, graphical and statistical analyses (Table IV) show conformity with the fluctuation pattern indicated by the annual and SW monsoonal rainfall regimes.

TABLE IV

10-Year and 20-year percentage deviations of Seasonal Rainfall from average (1871—1940) at Colombo

	SW monsoonal	NE monsoonal
A. 10-year		
1871—1880	+ 7.95	— 2.35
1881—1890	+ 3.00	+ 8.09
1891—1900	+ 12.01	+ 12.41
1901—1910	— 8.81	— 14.95
1911—1920	— 15.86	— 17.59
1921—1930	+ 9.67	+ 2.53
1931—1940	+ 11.90	+ 5.26
1941—1950	+ 11.90	+ 5.26
B. 20-year		
1881—1900	+ 7.51	+ 10.25
1901—1920	— 12.34	— 16.27
1921—1940	+ 10.79	+ 3.90

(*d*) *Convergence period trends*

It was mentioned earlier that in March-April and October-November, the island comes under the influence of the ITCZ. The rainfall regimes of the two periods were analysed using the earlier techniques and were found to give remarkable coincidence in the patterns. However, for convenience the two periods were combined and the results have been shown in graphical form (Fig. 4). It is seen that except for very slight shifts in the post-1920 phase-change timings, the "wet"-"dry" trends conform to the expected pattern. In view of the frequent cyclonic incidence in October-November, this slight discrepancy is understandable.

12. *Thambyahpillay, Rainfall Rhythm . . . . .", op. cit.*, p. 42
13. *Reports of the Colombo Observatory* for 1949 and 1951.

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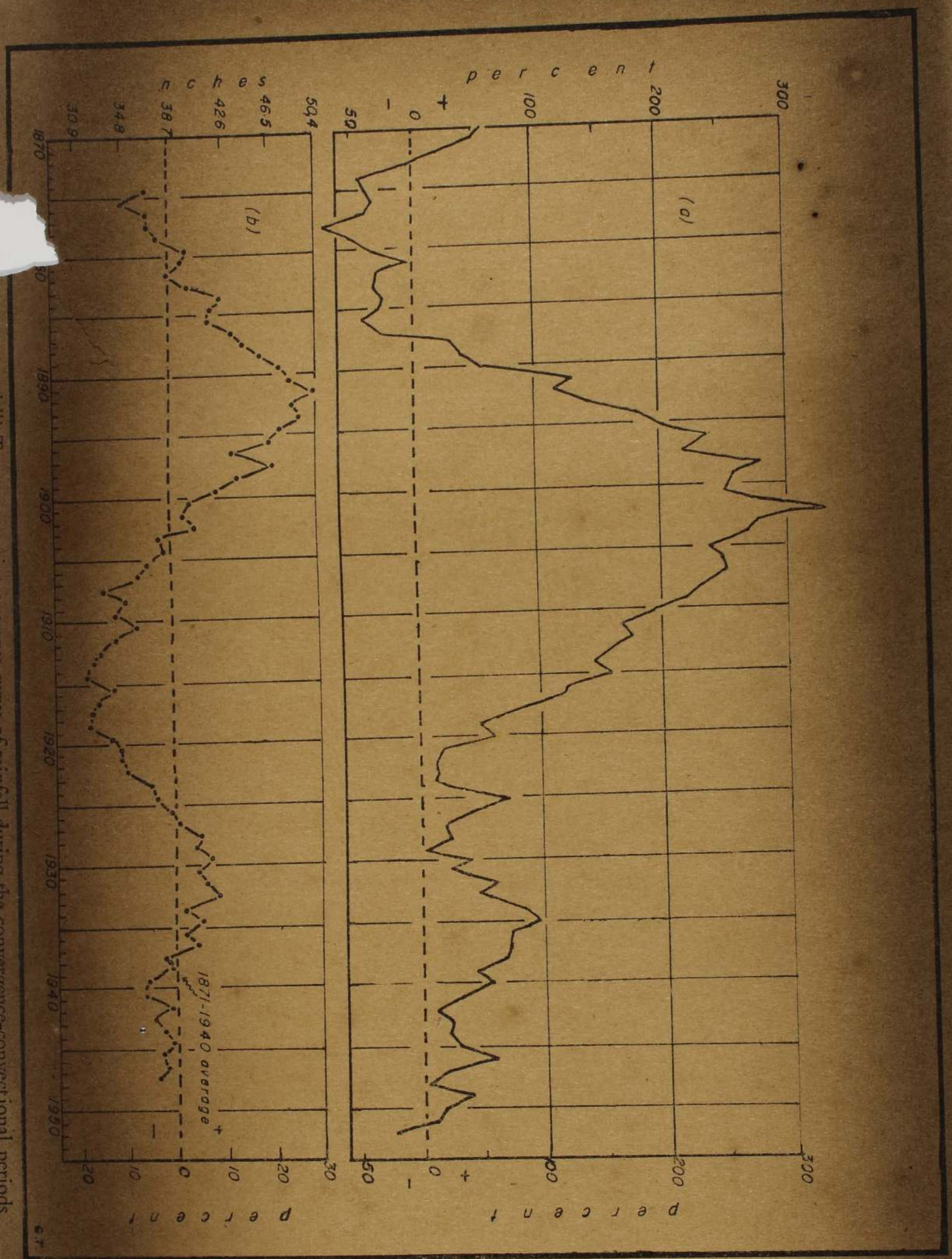

Fig. 4 (*a*) ass curve and (*b*) Ten-year moving averages curve of rainfall during the convergence-convectional periods Fort.

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CONCLUSION

It has been made evidently clear that the rainfall climate of Colombo has undergone definite fluctuations, corresponding to unmistakeable "wet" and "dry" phases. It is possible to recognize distinctly two "wet" and three "dry" phases, both in respect of the annual and seasonal rainfall regimes (Table V).

It must be noted though, that the "dry" phases viz., D1 and D3, have been adduced from insufficiently long-period data ; however, statistical and graphical analyses tend to support their inclusion in Table V, as forming continuities in the "wet"-"dry" sequence of rainfall phases.

TABLE V

Approximate "Wet" and "Dry" phases of the Rainfall climate of Colombo during the period 1870—1952

Phase	Period	Rainfall percentage deviations from average (1871—1940)			
		Annual *(81.20)	SW monsoonal *(20.42)	NE monsoonal *(10.60)	Convergence *(19.37)
D 1:Dry	1870—1876	—14.21	—38.34	—30.28	— 4.85
W 1:Wet	1877—1902	+12.50	+14.20	+20.66	+11.40
D 2:Dry	1903—1922	—12.24	—19.83	—26.88	—18.84
W 2:Wet	1923—1943	+ 5.44	+11.36	+11.41	+ 0.46
D 3:Dry	1944—1952	—11.49	— 3.77	— 3.37	— 5.11

* Average values in inches.

It has been clearly demonstrated[14] that world-wide tropical rainfall regimes have exhibited unmistakeably the general tendency for a decrease at the turn of the century. Furthermore evidence is also available indicative of a reversal trend i.e., positive anomalies, about the twenties and in turn a tendency for negative anomalies in the forties. It was also found that discharge values of the river Nile[15] conformed to this pattern of alternating "wet" and "dry" phases. It is thus seen that the "wet"-"dry" rainfall phases demonstrated in this paper for Colombo, seem to conform to a fluctuation-pattern of similar phase-intervals, as those indicated in other tropical rainfall regimes. The formulation of a satisfactory meteorological reasoning[16] to account for these fluctuation-trends, must needs await detailed investigations into the dynamics of the flow-pattern of the earth's total atmosphere.

GEORGE THAMBYAHPILLAY.

14. Kraus, "Secular Changes of Tropical Rainfall....", *op. cit.*
15. *ibid.*
16. The author is at present engaged in this investigation, the results of which will appear in a subsequent paper.

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Taxation Proposals of the Government

Introduction

"THE Government is fully conscious that an efficient and equitable system of personal taxation is fundamental to a fair and just society.... My (Finance Minister's) aim, therefore, is to cast the tax net more effectively, more realistically and more equitably by bringing the taxes levied on individuals into a far closer relationship with capacity to pay..... With these objectives in view, I propose certain changes in taxation which will result in the creation of an integrated, equitable and efficient machinery of direct taxation."[1] The new proposals have, therefore, been introduced with four main objectives in view: (i) the equitable distribution of the tax burden according to the capacity to pay, (ii) the closing of the existing avenues of escape, (iii) the procurement of maximum revenue that can be equitably collected and (iv) the increased efficiency of tax administration.

"The direct taxes, as they exist at present, fall on too narrow a base as the capacity to pay is measured by a restricted definition of 'income,' which is further narrowed down by an overgenerous treatment of expenses which are allowed as a deduction from profits[2]." Are we then not entitled to an explanation from the Minister of Finance why a better definition of income was not attempted and why income so defined as to include all capital gains and with weighting through time to eliminate undue fluctuations from year to year,[3] would not have been a better alternative to the proposed 'patchwork' system.

We are agreed with the Finance Minister that the burden of taxation at present falls more heavily on work than on property, "as many classes of gains, which arise not from effort and work, but are the direct result of the economic advantage a property-owner has over a fellow tax payer without property, now go untaxed under the existing system of taxation."[4] But while the inclusion of capital gains remedies to some extent this discrimination against income from work, the disallowance of the hitherto

1. Hansard, 17th July 1958 (uncorrected) : Budget Speech '58—'59. cc. 1184—1186.
2. Ibidem—c. 1184.
3. Vickrey, William—'Expenditure, Capital Gains and the Basis of Progressive Taxation in the Manchester School of Economic and Social Studies, Vol. XXV, No. 1, January, 1957.
4. Hansard—op. cit. c. 1185.

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allowed earned income relief introduces an element of discrimination against income from work, and this will affect particularly the incentive for productive work, which in my opinion, in the context of our economy, must be promoted.

The Finance Minister argues that the Government has not been getting as much revenue, as it should, by taxing income, on account of the far too many exemptions, allowances, deductions and other opportunities such as artificial division of property or business income between members of a single family, illegitimate evasion and legal avoidance.[5] Have the proposed system remedied these ? Have the opportunities for evasion been reduced by the new taxes ? Such are the questions to which we must seek answers in examining the new taxation proposals.

" The high marginal rate becomes fictitious and inoperative on account of the various avenues of escape..... The evasion at the higher brackets is so easy and so great that the actual revenue collected at these levels is very small."[6] After making this admission of the inefficiency of the present tax administration the Minister of Finance proposes to reduce evasion at high income brackets by reducing the marginal rate of taxation from 85 per cent to 60 per cent. But with the same breath he suggests that the non-residents ' immunity from wealth, capital gains and expenditure taxes is offset by the fact that his income tax remains unaltered and renders him liable to the higher rates of tax now prevailing. Does the Finance Minister here assume that the foreigner is honest as compared with the Ceylonese and the former therefore does not resort to tax evasion ?

We are agreed that the capacity to pay cannot be adequately measured by taking into consideration only income. But does the incorporation of the new proposals ensure equity between one class of tax payers and another ?

As pointed out earlier, the mere reduction of the marginal rate from 85 to 60 per cent does not close the avenues of tax avoidance. On the contrary, the introduction of the expenditure tax in order to bring within the tax net the higher income brackets, introduces many other avenues of escape. Disallowance of the earned income relief introduces discrimination against income from work. Taxing of all incomes (income inclusive of capital gains) as they are earned and taxing them when they are spent (under the expenditure tax) or saved (under the wealth tax) or

5. Ibidem—c. 1185.
6. Ibidem—c. 1185.

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gifted (the gift tax or the estate duty) introduces another type of inequity between one class of tax payers and another, by taxing the same thing twice or more. Taxing of gifts in the hands of the donor (and not the donee), subjecting capital gains to a maximum marginal rate of 45 per cent as against 60 per cent on other income, also violates the very principle of equity, that the Finance Minister is trying to 'salvage' by his new tax proposals.

General Comments

I. The taxation proposals of the Finance Minister are based on the recommendations of Kaldor, which are nothing but a replica of his reforms of Indian taxation.[7] There are, however, a few important differences with regard to detail. (1) The gift tax, according to the Report on Indian Tax Reform, is to be levied on the recipients, increasing progressively with their total taxable capacity. But in Ceylon it would be levied on the donor, and goes against the very principle of equity that the Finance Minister is trying to uphold. Whether this error is a result of a misunderstanding of Kaldor by the Finance Minister or a slip on the part of Kaldor himself is yet to be ascertained. If the idea of the gift tax on the donor is to discourage dissipation of fortunes before death, then why have a tax on net wealth ? (2) According to the Indian Tax Reform, marginal rates should have been reduced to 45 per cent. Following perhaps the Indian adaptation of Kaldor's proposals the Finance Minister has fixed the maximum marginal rate at 60 per cent. (3) Kaldor has apparently suggested that capital gains (aggregated with other incomes) should not be taxed at more than 45 per cent because of his recommendation of a maximum marginal rate of 45 per cent on other income. The Finance Minister who perhaps may not have understood the implications of the above, announced that capital gains would not be taxed at more than 45 per cent, notwithstanding a maximum marginal rate of 60 per cent on other income. This is a violation of the principle of taxing according to taxable capacity, and also introduces an administrative problem.

II. Taxing 'ordinary' income plus capital gains when they are earned and taxing expenditure when they are spent would be taxing the same thing twice. On transfer an asset presumably not only attracts a new valuation for the Wealth Tax but also the Capital Gains Tax, and/or the Gift Tax if it were given away or passed at death.

7. Indian Tax Reform : Report of a Survey by Nicholas Kaldor. Delhi Department of Economic Affairs, Ministry of Finance, 1956.

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III. The successful implementation of the new tax proposals inevitably depends on a comprehensive return furnished by the tax payer, and which must include (*a*) net wealth i.e., the change in totals over the year, (*b*) income return as at present, (*c*) gratuitous transfers (gifts made and received) (*d*) purchase and sale of capital assets during the year, (*e*) assets for personal use, (*f*) other capital and casual transactions, including sales and purchases of rights, leases and so on, as well as betting and other winnings, (*g*) and personal expenditure adjusted for exempted expenditure and for spreading-over of current and past purchases of durable consumer goods. The onus of providing the correct return rests with the tax payer. Can the tax administration and the tax payer reach that level of effeciency which is required for the successful implementation of the new proposals ?

IV. *Evasion* :—Are the incentives to evade, reduced under the new scheme ? Though the evasion of one tax is reduced due to the so called 'interlocking' of taxes,[8] outright evasion may yet be possible. Since under the proposed Expenditure Tax, chargeable expenditure must be ascertained on the basis of asset balances at the beginning and at the end of the period adjusted for income earned during the same period, evasion is bound to be as great as under an Income Tax. It may perhaps be more, since under an Expenditure Tax, expenditure can be concealed by spending on food and drink, and producing bogus medical bills. Mr Kaldor's self checking device would not work because the certificates of expenditure could be obtained from those who are below the taxable limit, or spending on the names of other people who escape expenditure tax, making gifts of less than Rs. 2,000/- every year, spending out of secret borrowing or by showing bogus loans in favour of people outside the tax orbit. PAYE system is possible under income tax, not under expenditure tax. Since gold and jewellery does not attract expenditure tax, (nor presumably a gift or a wealth tax) people may invest in them ; hoarding habits may increase, thereby impeding development.

V. *Administrative Difficulties* :—With regard to his Indian proposals Mr Kaldor himself admits that both the expenditure tax and tax on accrued incomes will be more difficult to administer than the present Income-surtax system, and emphasises that the Inland Revenue must be strengthened both in number and calibre of tax officers, and with higher pay ; but in the short period at least the supply of suitable officers is likely to be highly inelastic.[9] The situation is much more difficult in Ceylon. (1) Carry-forwards of capital losses under income tax make income tax returns

8. Hansard, op.cit. c. 1187.
9. Indian Tax Reform : op. cit.

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more complicated. (2) What is there to prevent the negotiation of faked deeds, purchases, sales, borrowings, lendings, repayments etc. in collusion with people who are outside the purview of personal taxation? What means are available to the taxing authority for unearthing credit or even cash purchases on food and drink ? Will the retail stalls be licensed and made to keep a record of every petty transaction ? Will there be surprise inspections of retail shops and household effects ? (3) Capital gains may be concealed by manipulating on paper the price of assets sold. Purchasers would not mind if they are not within the taxable class. For example a block of 5 acres bought for Rs. 350,000 may be sold in 32 individual blocks of 25 perches each at Rs. 500/- per perch, capital gain therefrom being Rs. 50,000. To avoid payment of the tax, however, the price may be marked down to Rs. 437.50. The purchasers who have bought these blocks to build houses for owner occupation may not mind it. (4) Kaldor in his ' An Expenditure Tax ' says " I do not believe, however, that, if a change-over to the expenditure basis of taxation were possible, there would be a sufficient case left for an annual tax on capital to surmount the serious administrative problems involved."[10] In Ceylon's case he may argue that the expenditure tax is only on those top income brackets (his case of surtax reform).[11] But then a tax on incomes inclusive of capital gains and a tax on expenditure beyond Rs. 35,000 per representative family, may be as effective as an income tax or an expenditure tax of the comprehensive type which Kaldor has in mind. Then where is the need for an annual wealth tax ?

VI. *Revenue Possibilities* :—The Minister assessed the revenue possibilities of his new proposals at Rs. 66 million, of which capital gains tax would contribute Rs. 25 million, wealth tax Rs. 20 million, expenditure tax Rs. 13 million and gifts tax Rs. 4 million. In India, Kaldor put the revenue from the capital gains tax between Rs. 25 to 40 crores, but the actual revenue per year was only Rs. 3 crores. Except in the realm of wild speculation, how can one estimate the revenue from capital gains tax without first ascertaining the values of all properties as at 1-4-58., and then making an assessment of the probable capital appreciation minus depreciation in one year. The revenue possibilities of the wealth tax can be assessed only after valuing all property within the taxable class. Revenue from expenditure tax can be estimated if the number of tax payers within the taxable class and their respective expenditures are known. Even if the present figures are known what is the guarantee that they will remain

10. Kaldor, Nicholas—An Expenditure Tax. Allen and Unwin Ltd. 1955, p. 90.
11. An Expenditure Tax : op. cit.

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unaltered after the impact of the expenditure tax on this class of tax payers? It is not conceivable how the Minister of Finance could have assessed the revenue possibilities of these taxes at Rs. 66 million ; as good a guess as this could have been made by a man in the street.

VII. *Development* :—In an underdeveloped economy like Ceylon the tax system should be so designed as to promote economic development.

Even though the reduction of the marginal rate to 60 per cent may be an incentive for work, the impact of the expenditure tax, wealth tax, and gift tax taken together may discourage saving and thereby investment.

Insurance premia are exempt under the present income tax and policies on maturity do not become liable to tax either. Now, policies may be subject to wealth tax, and attract also a spendings tax when matured policies are used for expenditure. Some save for greater spending in the future; they may be discouraged by the expenditure tax. Some others save in order to make provision for their children ; they will be discouraged by the wealth tax and more by the gifts tax. Though savings may generally be discouraged hoarding may be encouraged ; people may invest more and more in gold and jewellery ; parents can provide for their children by investing in such non taxable items every year.

After making the above general comments on the taxation proposals, as a whole, let me now examine in detail each specific proposal. In the field of personal taxation, the Minister of Finance proposes to reform the existing system by including a tax on realized capital gains minus losses, a tax on net wealth, a tax on personal consumption expenditure and a tax on gifts, and by replacing the ' family allowance system ' by a quotient system ; in the field of company taxation, by substituting a uniform tax of 45% for the existing income plus profits tax system, and disallowing certain deductions for expenses hitherto allowed ; and in the field of indirect taxation certain minor changes.

I shall confine my remarks below only to personal and company taxation.

Review of Specific Proposals

Capital Gains Tax :—Under this tax, with effect from the year of assessment 1958—59, all capital gains minus losses, realized after the 1st April, 1957, (thereby retaining the previous year's basis, as under the existing income tax) will be taxed, subject to a maximum rate of 45%.

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For tax purposes realization includes transfer under deed of gift, liquidation of a business, transmission on death or transfer to a trust. Carry-forward of losses is allowed indefinitely ; if a person's estate shows unabsorbed losses at death, the taxes which could have been reclaimable as losses will be credited against estate duty; unrealized capital gains at death will be added to the income of the deceased for the last assessment year.

In the case of tax payers who had no taxable income in the three previous years, capital gains upto Rs. 5,000, would be exempt ; capital gains on movable property, other than stocks or shares will only be charged if the gains exceed Rs. 2,000 in any one year.

The immediate impact of this tax may be largely psychological. Lower prices may now have to be quoted in order to induce the would-be-buyers to invest in shares. Others may sell now, expecting share prices to fall in the future. Overall effect of these would be to depress the share market. Those investors who have hitherto been investing more for capital appreciation than for an annual net yield, may now shift into safe investments with an assured net income ; risk bearing may thus be discouraged.

The tax as applied to Ceylon, can also be criticised on a number of other grounds :—

(1) There is no justification on equity grounds to subject capital gains to a maximum rate of 45% when other incomes are liable to a maximum limit of 60%. This may also create administrative difficulties.

(2) A tax on capital gains on transference at death may lead to double taxation, since they may attract estate duty also.

(3) There is 'a-priori' reason to think that easily traceable gains such as those on the Stock Exchange would be a much smaller part of total gains in Ceylon ; share market in Ceylon is both a restrictive and (mainly) an investment market. The advantages of a capital gains tax in Ceylon compared with the opportunity costs of administering the tax seems, therefore, very problematical.

Wealth Tax :—Net value of all property aggregated will be liable to this tax. Net worth upto Rs. 100,000, however, is exempt with an ½% tax on the next Rs. 400,000, 1% tax on the next Rs. 500,000 and 2% tax on anything above. The appointed date for the tax is 1-4-57 and the tax is due from the current year of assessment, on the previous year's basis. The responsibility for the initial valuation of all property rests with the tax payer.

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The tax can be criticised on three main grounds :—

(1) According to the provision made, the onus of valuing his property and furnishing a correct return rests with the tax payer. This is asking too much from the Ceylonese tax payer and may raise considerable administrative difficulty for the Tax Department. (2) Under the so called 'interlocking' system, though evasion through under-valuation or over-valuation may not be resorted to, outright evasion through non-declaration may yet be possible. Property may be overvalued if the avoidance of capital gains tax leaves the taxpayer with a smaller tax burden. (3) Lastly, to my mind, there does not seem any necessity for continuing the present Estate Duty also, along with the proposed Gifts and Wealth taxes.

Expenditure Tax :—This is a tax on personal consumption expenditure. In order to assess the net chargeable expenditure, the following deductions are made from the total expenditure : (i) business expenses, (ii) investment outlays, (iii) capital investment for personal use such as the purchase of a dwelling house for owner occupation (except the net annual value which will be the same as for income tax purposes), (iv) gifts not exceeding Rs. 2,000 per year and (v) necessitous expenditure such as (*a*) direct taxes, (*b*) court fines and expenditure incurred in criminal proceedings, (*c*) funeral and birth expenses not exceeding Rs. 2,000 (*d*) marriage exenditure upto Rs. 3,000 (*e*) medical expenses upto a maximum of Rs 3,000 and (*f*) expenses upto a maximum of Rs. 8,000 incurred in education of children abroad ; expenditure on durable consumption goods like furniture, motor cars, and expenditure for foreign travel are spread over five years. The tax takes effect from the assessment year 1959—'60 and is based on the expenditure incurred in the preceding year.

Taxable expenditure includes gifts received in kind and expenses met by employer. Respectively, these are taxed in the form of a gifts tax on the donor and not allowed as (tax-free) expenses to the employer. This amounts to taxing the same thing twice, both at the giving and the receiving ends.

Retired persons, who live on past savings will be adversely discriminated. Their savings are net of tax, tax having been paid on gross savings; when these savings are spent, he is taxed again. Is it equitable ?

Possibilities of evasion may be greater under the proposed spendings tax. People may spend more on food and drink in order to evade the tax ; it may be inflationary if the import of foods is restricted in order to divert foreign exchange earnings to the import of capital equipment.

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A period of five years has been arbitrarily chosen for spreading-over of durable consumer goods. The notional benefits derived from household equipment like a piano or a refrigerator, may, however, last much longer than five years.

The expenditure tax has apparently been proposed in order to curb extravagant expenditure and to stimulate capital formation.

If the idea of the expenditure tax is to promote capital formation, then why have a wealth tax, which may discourage savings and investment ? In this connection, it may be argued that the wealth tax may induce productive investment as against the possession of ' idle ' wealth. Productive investment, however, is guided more by other considerations, such as the profitability relative to risk-bearing, anticipation of probable profits as compared with probable losses and the availability of funds for working capital. If a probability of profit is balanced by a probability of equal loss, then other things remaining the same, the investor may prefer to pay the tax on idle capital (i.e. uncultivated land) rather than undertake new risks.

Gifts Tax :—By this tax a levy is made on the donor for all gifts aggregated exceeding Rs. 2,000 per year. In computing the gifts tax, credit will be given for stamp duty paid on the deed of gift. The rates of gifts tax are as follows :—

Upto	Rs.	2,000	nil
Next	,,	50,000	5%
,,	,,	25,000	8%
,,	,,	25,000	10%
,,	,,	40,000	12%
,,	,,	40,000	13%
,,	,,	80,000	18%
,,	,,	80,000	20%
,,	,,	80,000	25%
,,	,,	80,000	30%
,,	,,	80,000	35%
,,	,,	80,000	45%
,,	,,	80,000	50%
,,	,,	250,000	60%
,,	,,	450,000	80%
on balance			100%

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" In the calculation of estate duty, the estate duty on the whole estate (as if the gifts had not been made) will be computed and credit given for amount of gift tax paid. The present practice of not making a refund in a case where stamp duty credited against the estate duty exceeds the latter will apply in the case of gifts where stamp duty exceeds the gifts tax and in the case of an estate where the gifts tax to be credited against estate duty will result in a negative liability."[12]

The gifts tax comes into force in 1959—'60 and is applicable to gifts made after 1st April, 1958.

One strong criticism against this tax is that it is levied on the donor. This violates the very principle of equity, that the Finance Minister is trying to safeguard by the system of new taxes.

Quotient System :—The quotient system applies to both the Income Tax and the Expenditure Tax ; incomes and expenditures of family units are aggregated respectively for the two taxes and the tax liability is made to vary with the size of the family. Husband and wife are treated as one unit each ; each unmarried child under 25 as half a unit, excluding those above 21 and below 25 who run separate homes. The maximum number of units recognised for tax purposes is 4.

Under the income tax, each adult unit, (full unit) is given a tax-free allowance of Rs. 2,000, with the exception that a single person and a single person with a child or dependant, an extra allowance of Rs. 1,000 and Rs. 1,500 respectively ; the balance of the income of each unit will be charged on a slab system as follows :

on first Rs.	1,500	per each unit	5%
on next Rs.	1,500	,, ,, ,,	10%
,, ,,	1,500	,, ,, ,,	15%
,, ,,	1,500	,, ,, ,,	20%
,, ,,	1,500	,, ,, ,,	25%
,, ,,	1,500	,, ,, ,,	30%
,, ,,	1,500	,, ,, ,,	35%
,, ,,	1,500	,, ,, ,,	40%
,, ,,	3,000	,, ,, ,,	45%
,, ,,	3,000	,, ,, ,,	50%
,, ,,	3,000	,, ,, ,,	55%
the balance		,, ,, ,,	60%

12. Hansard (uncorrected version) 17th July 1958. Column 1203.

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In dropping the Earned Income Relief, (along with the other family allowances existing under the old system), the Finance Minister said that the need for an Earned Income Relief disappears with the new tax structure he proposes, in which a wealth tax forms a necessary part.[13] In the new system, however, while the discrimination in favour of income from work as against income from property is abolished, a new discrimination is introduced, a discrimination against accumulation of property and not income from accumulated property.

Under the Expenditure Tax, on the other hand, each unit will be given a tax-free allowance of Rs. 8,000 in addition to a basic allowance of Rs. 3,000 for each family irrespective of the number of units. The maximum possible allowance is Rs. 35,000, and is given to a family of 4 units or more. The rates of tax for each unit are as follows :—

on the first Rs.	5,000	of expenditure after tax free allowance	20%
on the next Rs.	5,000		40%
,, ,,	5,000		80%
,, ,,	5,000		160%
on the balance			240%

Taxation of Business and Professional Incomes :—(1) The most radical change in the field of company taxation is the replacement of the existing dual tax on company profits (30% profits tax and 39% income tax on profits net of profits tax) by a uniform tax of 45%. The exact implications of the provision as regards non-resident companies are not very clear. 45% was chosen as the rate of tax because it was deemed to impose the same effective burden. Let me examine this. Under the old system a company paid a total tax of about 57.3%. The effective burden therefore would be the same under the two systems only on the assumption that the shareholders under the old system, got a tax refund of 12.3%. Without such an assumption, it is not possible to make the comparison.

(2) Initial allowances and annual depreciation allowances will be replaced by capital allowances of 33 1/3% on industrial buildings, 50% on durable plant and machinery, 66 2/3% on normal machinery and 80% on shortlived equipment. These allowances could be treated as relief only on the ground that the respective present discounted value of the future annual depreciation of these capital assets would be reduced to the respective percentages of capital allowances given above. If they are more, which is likely in view of the existing and future likely interest

13. Hansard (uncorrected) 17th January 1958. cc. 1193—1194.

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rates, the capital allowances, at the beginning, would only amount to a deferment of a part of the tax liability. The development subsidy of 20% on capital expenditure newly incurred, on the other hand, is a total remission of a part of tax liability.

(3) Lastly, certain deductions for expenses, hitherto allowed, will be disallowed in the future. They are :—

(i) entertainment expenses of all kinds,

(ii) expense allowance given by a business to its executive staff,

(iii) travelling expenses of all kinds incurred in respect of the owner, partner, director or higher grade executive of a business (excepting the cost of passages abroad for the personal benefit of a director or an employee and his family), and

(iv) one half of the expenditure incurred on advertising.

No change seems to have been effected in single proprietorships and partnerships with respect to (iii) above. Sales promotion specially of new products, may be affected, particularly by (iv).

Conclusion :—Taking everything into account, new taxation proposals may not promote economic growth ; with regard to equity, will the inequities of the so called integrated system which may not work satisfactorily in practice be less than those of the existing system with its present standard of enforcement ? Avenues of tax escape and tax avoidance might, in all probability, increase. The net result will be that the purposes, for which the new proposals have been introduced, would be frustrated.

A. D. V. DE S. INDRARATNA.

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Gender in Colloquial Sinhalese

SYNTACTIC criteria for the setting up of Gender as a grammatical category in Colloquial Sinhalese are limited to the Nominal-Pronominal interrelations. Morphologically, however, much more criteria could be analysed and stated. Also, in Sinhalese it is difficult, and also uneconomical, to treat Gender independent of the categories of Number and Case. Case inflexions differ from Gender to Gender and even from word group to word group within the same Gender. These Case inflexions constitute distinct Number correlations which are, again, distinct from Gender to Gender. I find it necessary to set up Gender, Number and Case as three interdependent formal categories to handle the Nominal piece in Colloquial Sinhalese, but in the present paper which is devoted to an exponential statement of the category of Gender it is not proposed to delve into the realms of Number and Case in any detail. For the present purpose it is sufficient to state that one needs to set up two Numbers and four, or in some instances five, Cases to make a statement of the data presented in this paper. Examples quoted here are drawn from what may be labelled as Case 1.

The traditional statements on Gender are based on notional rather than formal criteria. Such notional grammars are a product of an attempt to study the functioning of linguistic phenomena in relation to extra-linguistic concepts and notions from a 'one-to-one' point of view. Language, however, has no one-to-one logical correlation with extra-linguistic phenomena which may be dragged into the field of grammar. If in any language the forms constituting a certain grammatical category happen to show some parallel with the external world, that should be treated as a mere coincidence. Why is the French word 'la table' Feminine ? Why is the Sanskrit word 'kalatra' Neuter ? These are not for the linguist to answer. For the linguist, that is how the French and Sanskrit languages are in use, and the linguist labels them Feminine and Neuter because they exhibit certain phonological and grammatical characteristics which distinguish them from the forms labelled in a different way.

The tradition in Sinhalese has been to treat such forms as *gonaa*[1], *miniha*, etc. as the Masculine of *denə*, *gæəni*, etc. which are supposed to be

1. The transcription used in this paper is adopted from the I.P.A. Long vocalics are indicated by writing the symbol twice.

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Feminine. This classification is entirely notional and no linguistic criteria could be adduced to substantiate the statement that one is the Masculine of the other. I feel that if one form is to be labelled as the Masculine or the Feminine of another the two forms should exhibit certain common characteristics which may be abstracted and stated as a common stem. In this paper, common stems are postulated for all forms which are treated as Masculine-Feminine correlates.

A stem, however, is not a pronounceable entity. The minimum pronounceable entity in a language is the word which has the potentiality of being used as a sentence by itself. All further classifications within the word are statements in abstraction. Abstractions are not meant to be pronounced ; they can only be quoted.

It is necessary to classify the nominal forms in Sinhalese into two groups from the point of view of the category of Gender. Firstly, there are those forms which can be arranged in pairs that may be labelled as Masculine—Feminine correlates.[2] Secondly, there are those forms which do not exhibit any criteria for such an arrangement. The main purpose of this paper is to make a statement on the first group from a prosodic point of view[3] in order to illustrate certain characteristic features in the Nominal piece in Sinhalese which would be of interest to the structural linguist as well as to the comparatist. In doing this a comprehensive phonological statement of the M/F correlates is not attempted ; only certain prosodic correlations are stated. And, stem abstractions are postulated only for the examples under consideration. The forms constituting the second group will be handled in even lesser detail.

M/F correlates are of three types :

(i) Those whose correspondences and differences are statable mainly in phonological terms.

kukula/kikili	(cock/hen)
balla/bælli	(dog/bitch)

2. Henceforth named ' M/F correlates.'
3. For prosodic theory of linguistic analysis see,
Allen, W. S. ' Some Prosodic aspects of Retroflexion and Aspiration in Sanskrit.' *BSOAS* XIII 4.
' Retroflexion in Sanskrit,' *BSOAS* XVI, 4.
Carnochan, J. ' Glottalization in Hausa ', *TPS*, 1952.
Firth, J. R. Papers in Linguistics 1934—1951.
Henderson, E. J. A., ' Prosodies in Siamese,' *Asia Major*, i, 2.
Palmer, F. R., ' The Verb in Bilin,' *BSOAS*, XIX, 1.

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(ii) Those whose correspondences and differences are statable mainly in morphological terms.

sinhəya/sinhə denə (lion/lioness)
eluva/elu denə (goat : buck/doe)

(iii) Those whose correspondences and differences are statable both phonologically and morphologically.

ætaa/ætinni (elephant/she elephant)
nayaa/næyini (cobra/female cobra)
muvaa/muvætti (deer : buck/doe)

In order to state the phonological correspondences and differences between the M/F correlates of Type I two prosodic elements of structure are postulated as Y and $\bar{Y}$. The exponents of Y-prosody include frontness in articulation, whereas the exponents of $\bar{Y}$-prosody include absence of frontness in articulation. Y-prosody is stated as an element of structure only in forms which are characterised by a front articulation all through. Where there is no front articulation all through, $\bar{Y}$-prosody is stated as an element of structure. In other words Y and $\bar{Y}$ in this paper are meant to be word prosodies and not syllable prosodies.

In correlates such as *kukula/kikili, balla/ bælli, kukka/kikki, daruva/dærivi,* the absence of front articulation all through the word in the first member and the presence of front articulation all through the word in the second member correspond to the stating of $\bar{Y}$ and Y prosodies for the two words concerned. Naming the $\bar{Y}$ forms 'Masculine' and the Y forms 'Feminine' it is possible to state for them the following generalised structure in which S = stem and E = ending.

Masculine	Feminine
$\bar{Y}$	Y
S—E	S—E

As the Nominals in question also constitute the first member of certain compounds it is profitable to take those forms also into consideration in setting up the stems. For instance, there are the forms *balla, bælli* as well as *balu-kama.* Similarly

kolla/kellə	*kolu-gæṭəya*	(boy/girl	little lad)
kaakka/kækki	*kaaku-bæna*	(crow/she crow	a kind of crows)
vassa/væssi	*vasu-pæṭiya*	(calf/heifer	little calf)
pissa/pissi	*pissu-miniha*	(mad man/mad woman	mad man)

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A consideration of all three instances, e.g. *kolla*, *kellə*, and *kolu-*, *vassa*, *væssi*, and *vasu-*, *pissa*, *pissi*, and *pissu-* facilitates the setting up of common stems whence such features as gemination and absence of gemination can be brought into focus of attention. As far as *vassa*, *væssi* and *vasu-* are concerned there is a long sibilant articulation in *vassa* and *væssi* whereas there is a short sibilant articulation in *vasu-*, which characteristics can be abstracted and stated as gemination and absence of gemination respectively by setting up only one phonematic unit in the stem structure. Not so, however, in *pissa*, *pissi* and *pissu-*, where a long sibilant articulation is observable in all three forms, whence gemination and absence of gemination may not be stated.

The above note is to explain the final element in the stem structures set up henceforth.

An *-ə* ending is stated for both M. and F.

Then the generalised phonological structure (without marking gemination etc). of the M. form *kolla* will be

$$\frac{Y}{K\epsilon L - ə}$$

and that of the F. form *kellə* will be

$$\frac{Y}{K\epsilon L - ə}$$

In order to focus attention on this characteristic feature of M/F correlates I set out below the generalised phonological structures of some forms chosen at random.

D α R-

$$\frac{\overline{Y}}{D\,\alpha\,R - ə}$$

daruva

$$\frac{Y}{D\,\alpha\,R - ə}$$

dærivi

PiSS-

$$\frac{\overline{Y}}{PiSS - ə}$$

pissa

$$\frac{Y}{PiSS - ə}$$

pissi

$$\frac{\overline{Y}}{V\,\alpha\,S - ə}$$

vassa

$$\frac{Y}{V\,\alpha\,S - ə}$$

væssi

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B α L ə L-

$\bar{Y}$	Y
B α L ə L — ə	B α L ə L- ə
balala	*bæləli*

V α D *i* R-

$\bar{Y}$	Y
V α D *i* R — ə	V α D *i* R — ə
vaňdura	*væňdiri*

II

In the M/F correlates of Type II a suffix *denə* is statable for the F. The generalised structure of these forms is as follows :—

M. : S + inflexion
F. : S + *denə* + inflexion

e.g.

M. *sinhəya,*	F. *sinhə denə*	Lion, lioness
M. *eluva,*	F. *elu denə*	goat : buck, doe.
M. *haava,*	F. *haa denə*	hare : buck, doe.
M. *nariya,*	F. *nari denə*	jackal, female jackal.

III

As for the correlates of Type III, non-front articulations are observed in the M. and front articulations in the F. forms, which correspond to the stating of $\bar{Y}$ and Y prosodic features. In addition the F. forms have a suffix -ni or -ti. The juncture features between the stem and the suffix include a vocalic articulation and often also a tense consonantal articulation statable as gemination.

e.g.

α T—

$\bar{Y}$	Y
α T — ə	α T — ə — NI
ætaa	*ætinni*

N α Y-

$\bar{Y}$	Y
N α Y — ə	N α Y — ə — NI
nayaa	*næyini* (non geminate junction)

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M *i* V—

Y	Y
M *i* V—*ə* *muvaa*	M*i* V—*ə*—TI *muvætti*

The Pronominal forms substitutable for the M. Nominal forms include *uu* and *ohu* etc. which are not substitutable for the F. Nominal forms. The Pronominal forms substitutable for the F. Nominal forms include *ææ* which is not substitutable for the M. Nominal forms. Therefore the Pronominal forms *uu/ohu* and *ææ* are further criteria for classifying M. and F. forms into two compartments. On these grounds the forms which do not constitute correlates can also be classified as M. or F. according to the Pronominal functioning.

Among forms which do not fall into the group called M/F correlates, not all forms can be named M. or F. according to the Pronominal functioning. There are forms for which *uu* or *ææ* cannot be substituted. The Pronominal form substitutable for them is *eekə*. On these grounds those forms may be classified into a still different type which may be called the Neuter forms.

Thus for instance, *malli* (younger brother) will be M. *nangi* (younger sister) will be F., but they are not correlate forms. *potə* (book) will be Neuter.

The foregoing is an attempt to set up Gender as a grammatical category in Colloquial Sinhalese from a formal point of view. It is presumed that the observations made in this paper hold good for any Modern language. What, for instance, are the formal criteria for establishing 'hen' as the Feminine of 'cock' in English except where they have some inflexional status as in 'pea-cock' and 'pea-hen ?'

M. W. S. DE SILVA.

BSOAS : Bulletin of the School of Oriental and African Studies.
TPS : Transactions of the Philological Society.

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The Background of The Nayakkars of Kandy

THE kings who ruled the Kandyan Kingdom from 1739 to 1815 are often called Nāyakkārs. This is because of their associations with the Nāyaks of South India. And these kings themselves were conscious of this and since it was no advantage, did their best to behave like the former Sinhalese kings, adopting their names, language and religion. Their queens also followed the same policy and says the Cūlavamsa author,[1] "The mahesis of the king too gave up false faith to which they had been long attached, and adopted in the best manner possible the true faith which confers immortality."

The period covered by their rule was a very important period in the history of Ceylon. It saw the end of Dutch rule in the maritime provinces (1796) and its supersession by the rule of the British and also the end of Sinhalese sovereignty which had been fighting for a long time a losing battle for survival. The Nāyakkār kings of Kandy also had a part to play in the driving away of the Dutch and the coming of the British, as well as in the disappearance of the independence of the Kandyan kingdom itself. And all these events were closely connected with their origins in India. The intimate connections the Nāyaks of S. India had with the British in India helped them to obtain their help against the Dutch in Ceylon. And the fact that the Nāyakkārs were South Indians by origin led to their being looked upon with disfavour by the Kandyan chiefs and the people; and they were often spoken of as "Vadugas"[2] in the sense of "foreigners" or "Northerners".

It is, however, interesting to note that inspite of this importance of their origin so far it has received no serious attention, and authors have always been content to call them as being of Madura or Tanjore Nāyak origin, or in a still more general sense as being of Malabar origin. The Pali Chronicles as well as Dutch documents have left us considerable information which could indicate from where the Nāyakkārs came to Kandy, and this is to a great extent confirmed by a few Tamil and English writings. The Dutch writers, in particular, would have known their original place, because it was in their ships that sometimes princesses were brought to Ceylon.

1. *Cūlavamsa*, II, Chapter 98, v. 6—7.
2. Wadagai—a caste in South India.

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Father S. G. Perera says[3] that it was Senarat (1605—1635), the successor of Vimaladharmasuriya, who revived the long-abandoned practice of procuring Indian queens for the Sinhalese kings. But the available information on this subject throws considerable doubt as to the validity of this statement. According to the *Cūlavamsa*[4] the first king to do so was Rajasingha II (1635—1687) who " brought king's daughters hither from the town of Madhurā." Rajasingha II was the son and successor of Senarat. There are two other independent works which ascribe this innovation to Vira Narendra Sinha (1706—1739) the last Sinhalese king of Kandy. They are the Memoirs of the Dutch Governor, Jan Schreuder[5] (1757—1762) and " Mirtanjaya " a Tamil MSS[6]. According to the former, " This Virapparakrama Narendra Singa was the first king who was related to the Malabar nation by his marriage with a princess of the opposite coast who was a daughter of one Pitti Nayaker of the Badegas caste."[7] The other, however, does not give the name of the king so explicitly as above, but from the account it could also be placed in the time of the same king of Kandy, as the Nāyakkār to whom he sent for a princess was Vijaya Ranga Chokkanatha Nāyakkār of Madura (1706—1732).

The author of *Cūlavamsa* would have had access to local sources which had recorded the past events, and hence was more reliable than what Schreuder had to say. Paul E. Peiris who has based his " Ceylon and the Hollanders "[8] on much of Dutch information also refers to the queen of Rajasinha II who was a " member of the royal family of Madura," and it may be suggested that this practice of bringing princesses from South India was there at least from about the time of Rajasinha II.

The question as to from whence they came, we have to depend on more or less the same sources. But there seem to have been a little confusion as to whether they came from the western or the eastern coast of South India, with the Dutch[9] and the British[10] calling them Malabars in a general sense, while the Sinhalese also called after them the street or suburb which they resided in as " Malabar Veediya." They were called Malabars probably because it was thought that they came from the Malabar

3. A History for Schools, Pt. I, p. 133.
4. *Culavamsa*, II, Chapter 96, v. 60.
5. Memoir of Jan Schreuder, Tr. Reimers.
6. Oriental Historical MSS II, Taylor (1835) (O. H. MSS) Appendix G, p. 43—47.
7. Schreuder, p. 30.
8. P. 3.
9. Schreuder, p. 28, "We might add to this that the Court through the intermeddling of the Nayakkars (a kind of Malabar court nobility, to which the crown of Kandy has now for some years past been allied by marriage)."
10. Colvin R. de Silva, Ceylon under the British I, p. 148.

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coast, but a glance at a map of South India will show that Malabar coast is on the western side, while the majority of the available sources trace their origin to Madura and Tanjore and to the eastern coast which forms the Coromendal coast, and was closer to the ports of the eastern coast of Ceylon through which the Kandyan kings had all their dealings with India.

The available Pali, Tamil, Dutch and British sources, all trace the origins of Nāyakkārs of Kandy to the eastern half of South India. Some only to the Coromendal coast, while others go as far as Madura and Tanjore. According to the *Cūlavamsa*[11], Rajasinha II and his successors brought princesses from Madura and made them their first mahesis. The author of *Cūlavamsa* calls these maidens "king's daughters" and "daughters of first mahesis" of Madura. The Tamil MSS "Mirtanjaya"[12] also says that Ceylon kings sent for brides to the Nāyaks of Madura or Tirusirapuram (Trichinopoly), and once the Nayaks were deprived of their traditional possessions by the Muslims and the English and made their way to the Coromendal coast, they continued to provide brides for the Kandyan kings, who by which time were Nāyaks themselves. And this same MSS says[13] that Kirti Sri Maha Raja, one of the Nāyakkār kings of Kandy, got down some dispossessed Nayaks of Tanjore, also living on the Coromendal coast. This is confirmed by the Tanjore Manual[14] which says that "the king of Kandy sent for some of the descendants of Vijaya Raghava and gave them fiefs in Ceylon, marrying them to his relatives."

The Dutch Governor, Imhoff (1726—1740)[15] in his Memoir to his successor draws attention to the negotiations for a marriage of the new king (Vijaya Raja Sinha 1739—1747) which have been carried on for some time with a high family on the opposite coast, of the Soerianse or so-called Sun-caste living at Konge Kondain, not far from Atour."[15a] Atour which is referred to here has not been identified and the only place on the coast of Coromendal which comes any closer to it is Adriam-patnam not very far from both Trichinopoly and Tanjore. Schreuder[16] also refers only to the opposite coast, but makes no mention of any definite place. This reference to the opposite coast may be because of the fact that the Nāyaks by this time had moved to the coast.

11. Cūlavamsa, II, 96.60, 97.2, 97.23-24, 98.1-4.
12. P. 47—49.
13. P. 49.
14. Tanjore Manual (1883), p. 758.
15. Memoir of Governor Imhoff, Tr. Reimers, p. 14
15*a*. Atour, place in Salem but right in the interior and far north of both Madura and Tanjore.
16. Schreuder, p. 30.

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Pybus[17] the Englishman who visited Kandy in 1762 was also acquainted with "the custom" among them (i.e. the kings) to have their wives from some part of the coast of Coromendal, and of Gentoo (Hindu) caste who are brought from Madura, Tanjore or Mysore countries." The king who occupied the throne at the time according to him was from the Madura country.

There is thus a great degree of agreement as to from whence came the Nāyakkārs of Kandy. Originally they came from Madura, and after its occupation by Muslims, they were residing on the Coromendal coast and from there continued to send brides to Kandy.

These people of South Indian stock who provided brides and successors to the kings of Kandy are often considered as of Nāyak origin. The Nāyaks were the Viceroys who were placed in charge of the distant provinces of the Vijayanagara Empire. There were a number of these viceroyalties, the most important of them being at Madura, Trichinopoly and Tanjore. After the decline of the Vijayanagara Empire in the 17th Century and its authority over the outlying areas fell off, and the furthest provinces like Madura and Tanjore asserted their independence, the Nāyaks themselves assuming the authority of kings.

The Cūlavamsa[18] calls these brides who came from Madura as "king's daughters" and "daughters of first mahesis," but according to other authorities, it does not seem to have been necessarily so, at least till the termination of the Nāyak rule in Madura and Tanjore; and as Paul E. Peiris[19] says they could have been the daughters of Polygars or noblemen who may have claimed kinship with the ruling Nāyak families.

The ruling Nāyaks as well as Hindus of the South, due to increasing Muslim inroads had become extremely conservative in the matter of religion and social institutions, and hence do not seem to have looked with favour on proposals of matrimony from the Sinhalese Buddhist kings of Kandy. In fact when Vira Narendra Sinha, the last Sinhalese king of Kandy asked for the hand of a daughter of Vijaya Ranga Chokkanatha (1706—1732) the last Nāyak of Madura, the latter seems to have been "horrified at what he considered to be the audacity of the Ceylon king, because of his inferior caste, and had dismissed the Ceylonese with scant courtesy."[20] And in "Mirtanjaya"[21] this whole episode is given in graphic detail,

17. Pybus' Mission to Kandy in 1762, p. 25; (18) Culavamsa, II, 96.90, 97.2.
19. Ceylon and the Hollanders, p. 64.
20. Sathianatha Aiyer, Nayaks of Madura, p. 230
21. O. H. MSS, II, App. G., p. 47.

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while it also recalls the time when a similar request from Vijaya the first king of Ceylon, to the Pandian king was refused, but he was " supplied surreptitiously with a wife by a subject of the latter king who gave one of his own daughters."[22] In a similar manner, according to the same authority,[23] Narendra Sinha, also obtained a daughter from a " very poor person in the country, of our religion (i.e. Hindu), who went with the Kandi people and lived there."

After the death of Narendra Sinha, a brother of his Madura wife succeeded to the throne under the name of Sri Vijaya Raja Sinha (1739—1747). He also sent for a bride from Madura, but inspite of his being a son of a " very poor person " he was more fortunate. This may be because he was of Indian origin, while his predecessor was Sinhalese and Buddhist.

At the time he sent for a bride, according to " Mirtanjaya,"[24] " King Vijaya Ranga Chokkanathan was deceased .... and as the king Bangaru Tirumali Naicker had been driven away, and was come to reside at Velleicurachi, his relatives and dependents had left him, and were dispersed, and one of these reflected ' as the king of Kandi who has sent these messengers, is of our religious persuasion, it may be permitted us to give him a wife, accordingly he went and gave the king a wife." Thus when in their state of destitution they gave a daughter of their's to the King of Kandy, and with her came the entire family, one of her brothers succeeding to the throne at her husband's death. This was Kirti Sri Rajasinha, and it may be correct to say that the real Nāyakkār rule started with him. Kirti Sri in turn married " two daughters of Vijaya Manan Naicker, the grandson of a former king of Tanjore named Raja Vijaya Ragheva Naicker."[25]

Certain aspects of general interest regarding the Nāyaks who arrived in Kandy were their state of utter destitution and their failure to produce children by their wives of Indian origin. Whenever a request for a bride was sent, it proved a great blessing to some of the exiled Nāyak families. Posthaste they came, with all their kith and kin, and in time to come there grew up in Kandy a strong faction of Nāyak extraction, residing in a separate suburb, some of them occupying important offices in the realm, while others like Narenappa Nāyak, father of Kirti Sri, engaged in maritime trade between India and Ceylon.

22. Ibid., Vol. I, p. 183.
23. O. H. MSS., II, p. 47.
24. O. H. MSS., II, p. 49.
25. Ibid.,

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THE NĀYAKKĀRS OF KANDY

The failure of the Nāyakkār rulers of Kandy to produce children by their Indian wives was conspicuous of their rule here, but their attempts in this direction were more successful with their Sinhalese wives ; The children by the latter, however, were not considered for the throne and it always passed to the brothers of their Indian brides.

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