Ancient Land Measures of Ceylon

By D. B. ELLEPOLA, B.Sc. (LONDON), F.R.G.S.,
Assistant Superintendent of Surveys, Ceylon Survey Department.

INTRODUCTION

1. The subject of this paper, though originally intended to cover only the question of ancient land measures of Ceylon, has had to be widened to include ancient measures of length, weight and capacity, as well as surface measures, because these are all so closely allied to one another and derived one from the other, that it is almost impossible to deal with any of them separately. Ancient measures of distance are also dealt with in the concluding paragraphs as a matter of interest, although they do not directly affect ancient land measures, which are the subject of this paper.

2. I shall briefly endeavour to trace the growth in Ceylon, of the various weights and measures from the earliest dates, until the time of their present standardization, as effected by Ordinance No. 8 of 1876, which is now in force, and has declared the "Imperial pound Avoirdupois" as the unit measure of weight, and the "Imperial yard," with its multiples and sub-divisions, as the standard measure of lineal extension.

3. Judging from the close resemblance between the local terms of weights and measures, and the Sanskrit measures of ancient India, it seems fairly evident that the measures of Ceylon are also of Indian origin.

4. As to whether the weights and measures of ancient India were indigenous or exotic, is a matter of dispute. It has sometimes been attempted to trace the derivation of the Indian systems of weights and measures to Egyptian sources. This is refuted by Mr. Edward Thomas, late of the East India Company's Bengal Civil Service, an authority on Indian weights and
measures, whose opinion is expressed in his paper on "Ancient Indian Weights," contained in "Numismata Orientalia." I shall here quote Mr. Thomas: "The origination of the Indian system of weights in India, however, seems to admit of no question, the fundamental principles of which were probably framed in situ before the Vedic Aryans moved from the banks of the Oxus and long before the Western branch of the Aryan family took their first lesson in Hellenic idolatry. That the Indian system should disclose fragmentary points of relationship to the Egyptian and more decided associations with the Accad civilization of the Euphrates valley, was only to be expected—the three great nationalities were all members of the great Turanian family, who seem jointly to have occupied the southern limits of the supposedly habitable earth. But the intrusion of new nationalities on the Tigris, severed whatever of ethnic continuity may have previously existed, and left India to work out her own future, undisturbed by ties of race or foreign intervention—so that many centuries afterwards when the Greeks penetrated into the land, they felt and acknowledged a purely independent national development, altogether removed from the characteristics of the older Oriental nations with whom they had come in contact."

5. It may also be correctly presumed, that the principle of measuring weights by balancing quantities, one against the other, was of Indian origin. To the people of Ancient India and Ceylon, whose habitual mode of carrying weights, was by the "Pingo," i.e., by slinging them to the opposite ends of a bamboo, poised on the shoulder, it would have required but slight mental effort to develop and understand the mechanical principles of the balance.

ANCIENT LINEAL MEASURE

6. Colebrooke, in his essay on the "Ancient Indian weights and measures," quotes the following table as being given by Gopala-bhatta as a text from "Viriddha-Manu," an ancient book of Hindu law, which is regarded as probably the precursor of the present version mentioned by Madhana and other commentators. These
measures are traced from the same minute quantity, which occurs in the tables quoted under Measures of Weight, i.e., the "Trasareṇu," which latter was described as the smallest mote, which could be discerned in a sunbeam passing through a lattice:

8 Trasareṇus = 1 Reṇu
8 Reṇus = 1 Bāḷāgra or hair's point
8 Bāḷāgras = 1 Likkā or Likshā or Likhya
8 Likshās = 1 Yūka
8 Yūkas = 1 Yava
8 Yavas = 1 Angula or finger
12 Angulas = 1 Vitasti or span
2 Vitastis = 1 Hasta or cubit

7. The following table is also quoted by Colebrooke as occurring in the "Mārkandeya-purāṇa," a well known sacred work of legendary history, supposed to have been composed by the poet Vyasa:

8 Paramanus or atoms = 1 Para-sūkshama (most minute substance)
8 Para-sūkshamas = 1 Trasareṇu
8 Trasareṇus = 1 Mahirajas, grain of sand or dust
8 Mahirajas = 1 Bāḷāgra or hair's point
8 Bāḷāgras = 1 Likkā or Likshā or Likhya
8 Likshās = 1 Yūka
8 Yūkas = 1 Yava
8 Yavas = 1 Angula or finger
6 Angulas = 1 Pāda or breadth of the foot
2 Pādas = 1 Vitasti or span
2 Vitastis = 1 Hasta or cubit
2 Hastas = The circumference of the human body
4 Hastas = 1 Daṇḍa (a staff)
           Dhanus (a bow)
2 Daṇḍas = 1 Nadika or nadi

8. The measure the "Daṇḍa" is farther developed by Mr. Edward Thomas, as derived from various sources, as follows:

2,000 Daṇḍas = 1 Kroṣa
2 Kroṣas = 1 Gavūti
4 Kroṣas = 1 Yojana
9. I shall proceed to give below several tables of local lineal measure as recorded by local writers:

(a) As taken from the "Abhidhammappadi pikā," and ancient Pali vocabulary compiled about the 12th century, by Moggallāna:

36 Paramanus = 1 Anu
36 Anus = 1 Tajjāri
36 Tajjāris = 1 Ratharenu
36 Ratharenu = 1 Likkā or Likshā or Likhya

7 Likshās = 1 Ùka
7 Ùkas = 1 Dhaññamāsa
7 Dhaññamasas = 1 Angula (Finger joint inch)

12 Angulas = 1 Vidatthi (span)
2 Viddattthis = 1 Ratana (Cubit)
7 Ratanas = 1 Yaṭṭhi
20 Yaṭṭhis = 1 Usabha
10 Usabhas = 1 Gāvuta
4 Gāvutas = 1 Yojana

Note.—It is the opinion of Mr. T. W. Rhys Davids, late of the Ceylon Civil Service, that this table of measures was never in use in Ceylon. Apart from the fact of the use of the finger joint, span and cubit for short measures and the Usabha, Gāvuta and Yojana, which I shall deal with later, as measures of distances, it is his opinion that no effort was made to correlate these measures correctly, the above correlation being merely imaginary, without any attention being paid to relative measures, but merely giving them names used by the Sanskrit Lexicographers.

(b) The following table of lineal measures, which was supplied to me by Mudaliyār C. Rasunayagam, formerly of the Ceylon Civil Service, as having been in use in the Tamil Districts of Ceylon, is interesting for the striking resemblance it bears to the Indian tables of measures referred to above:—

8 Atoms = 1 Dust raised by a cart wheel
8 Dusts = 1 End of cotton fibre
8 Ends of cotton fibre = 1 End of hair
8 Hair ends = 1 Sand
8 Sands = 1 Mustard seed
8 Mustard seeds = 1 Paddy seed
8 Paddy seeds = 1 Finger end
12 Finger ends = 1 Span = 9 inches
2 Spans = 1 Cubit = 1½ Feet
4 Cubits = 1 Kole = 6 Feet
500 Koles = 1 Call Distance = 3,000 Feet
4 Call Distances = 1 Kadain
24 Fingers = 1 Hand or Cubit = 18 inches
4 Hands = 1 Bow = 6 Feet
2 Bows = 1 Rod = 12 Feet
1,000 Rods = 1 Krośa = 1 Kadain

(c) The following is an interesting table of measures as taken from the "Bhaisajyakalpaya," a standard ancient medical work. It is doubtful whether the smaller measures referred to therein were ever in use, except as colloquial terms to make reference to minute lengths. Here too the Indian origin of the local measures is quite clear:

8 Paramaṇus = 1 Trasareṇu
8 Trasareṇu = 1 Rataraṇu
8 Rataraṇu = 1 Vālagra or the tip of the
hair of a horse's tail
8 Vālagras = 1 Lehendiya; a nit
8 Lehendiya = 1 Ukuna; a Louse
8 Ukunas = 1 Yava eta
8 Yava etas = 1 Angala
12 Angalas = 1 Viyata
2 Viyatas = 1 Cubit
4 Viyatas = 1 Niska
2 Niskas = 1 Dūnna or bow
1,000 Dūnna = 1 Kosa
3 Kosas = 1 Gauva
4 Gauvas = 1 Yoduna

Note.—The Viyata which is the space covered by the thumb and the little finger stretched to the fullest extent has two subdivisions, viz.:

(i) A Vagussa, the space covered by the thumb and forefinger bent at the second joint, pressed on a flat surface and stretched to their fullest extent.

(ii) A Vigussa, the space between the thumb and forefinger stretched to the fullest extent.
10. (a) Pridham, an historian of early British times, makes reference to a "Bamba" and a "Bandara Bamba" as measures of length. The former is given as the length or distance an adult can reach by extending the arms horizontally on both sides, with out-stretched fingers, and measured from the finger tips on one side to the finger tips on the other. This measure according to the "Abhidhammapadipika" is the equivalent of the English fathom. The "Bandara Bamba" was the height from the ground a man could reach with the tips of his fingers, when the arms and hands were fully stretched above the head. This was considered to be nine feet in length and five hundred "Bandara Bamba" were given as equal to an "Hetekma" or a mile. A term of measure in common use in various parts of Ceylon is the "Wadu-riyane" so called as it was a measure in use amongst carpenters. This measure was equal in length to 24 "angalas," the Carpenters' "angala" being equal to the space between the second and third joint of the forefinger, seven such angalas being equal to one Viyata or span.

(b) Other terms of measures of length often encountered are the following:
1. 'Viyangula', meaning a measure equal to the breadth of five fingers.
2. 'Miti-Riyane', which is the distance between the elbow and the knuckles, when the fingers are closed into the palm.
3. 'Kewitaka diga' which means the length of a 'Kewita' or a goad, which a farmer uses to drive his bullocks. This is generally regarded as being the equivalent of about three feet.
4. 'Ratasaka Pramanaya' meaning the size of a cart wheel, was a circular measure in use in ancient times. Though this would appear to have been of a varying size, it perhaps in ancient times signified a specific measure as cart wheels or chariot wheels may have then been of a generally standardized size.

(c) Among the common terms used for signifying measures of depth, were terms such as 'Niyapita', 'Pitapatulak', 'Eswatak', 'Danawatak',
'Inawatak' and 'Karawatak', meaning respectively, the depth up to toe nails, instep, ankles, knee, waist and neck, of an adult when standing erect. The term 'Walalukarak' was used to mean the depth up to a point just above the ankles, in which position it was customary for the ancients to wear at times 'Walalu' or Bangles. The term 'Yotak-Jambura' is one in use in the Maritime Provinces, to mean the depth to which a fishing tackle or 'Yota' could be lowered and is generally taken to mean a depth of twenty fathoms.

ANCIENT MEASURES OF WEIGHT

II. According to Mr. Edward Thomas quoted above, in an authoritative text on the original code of Hindu law, said to have been expounded by Manu, the earliest Hindu Law Giver, and compiled about 400 B.C., the following table of weights appears as subdivisions and multiples of the then established unit of weight, the "Rati," which is identical with the beautiful hard and shining red and black "Gunja" or "Olinda" seed of Ceylon:

8 Trasareṇus = 1 Likkā or Likśā or Likhya (a minute Poppy seed)
3 Likśās = 1 Rāja-Sarshapa (a black Mustard seed)
3 Rāja-Sarshapas = 1 Gaura-Sarshapa (a white Mustard seed)
6 Gaura-Sarshapas = 1 Yava (a middle-sized Barley Corn)
3 Yavas = 1 Krishmalā or Rati

The description of the Trasareṇu is as already given in the tables under the head of lineal measures, in paragraph 6.

12. Specimens of the Rati have been weighed and found to average 1.75 grains, the weight of a Trasareṇu thus working out at .00135 of a grain. It seems certain that no such measure of weights actually existed, and the term was used merely to indicate quantities of very small measure, smaller than the minute Likkā.

13. The multiple weights of the Rati, used for Silver and Gold, are as follows:

Silver:
2 Ratis = 1 Māshaka
16 Māshakas = 1 Dharaṇa or Pūraṇa
10 Dharaṇas = 1 Śatamāna
Gold:
5 Ratis = 1 Māsha
16 Māshas = 1 Svarṇa
4 Svarṇas = 1 Pala or Nishka
10 Palas = 1 Dharana

14. In order to indicate how freely the ancients of Ceylon have drawn on Indian sources for terms of reference to weights, I quote below a table of weights as appearing in the "Abhidharmapadipikā." The considerable difference in the respective measures led Mr. T. W. Rhys Davids to the conclusion, that Moggalāna had made unjustifiable assumptions, and put in imaginary measures to which he ascribed the names used by the Sanskrit Lexicographers, regardless as to whether he changed the relative values or not. Of these terms of weight only the "Kalandā," "Masaka," Maṅchādiya or Maditiya, the Palam and Vi-eta have been in actual use in Ceylon:

Moggalāna's Table of Weights

4 Vi-etas = 1 Guñjā or Olinda seed (Another name for Rati)
2 Guñjās = 1 Māsaka
5 Māsakas = 2 Akas
8 Akas = 1 Kalandā or Dharana
5 Kalandas = 1 Svarṇa
5 Svarṇas = 1 Nikkha
10 Dharanas = 1 Palam
100 Palams = 1 Tulā
20 Tulās = 1 Bara or Karīsa

15. The following tables of weight are taken from the standard ancient medical work quoted over each. Some of the measures referred to in the tables are in actual use today:

(a)

The "Yogaratnakaraya."
3 Gingelly seeds = 1 Amu seed
3 Amu seeds = 1 Grain of paddy
8 Grains of paddy = 1 Maditiya or Maṅchādiya
20 Maditiyas = 1 Kalandā
3 Kalandas = 1 Huna
2 Hunas = 1 Half Palam
2 Half Palams = 1 Palam
2 Palams = 1 Kulundula
2 Kulundulas = 1 Pata
4 Patas = 1 Nĕduba or Nĕliya
4 Nĕdubas = 1 Laha
9 Lahas = 1 Drona
(b) "THE BHAISAJYAKALPAYA."

6 Siyum Renus = 1 Marichi, or clear ray
6 Marichis = 1 Aba-eta
6 Aba-etas = 1 Rat-el (a kind of Paddy)
2 Rat-els = 1 Undu-eta
2 Undu-etas = 1 Yava-eta
4 Undu-etas = 1 Sana
2 Sanas = 1 Vaṭaka
4 Vaṭakas = 1 Mita or Palam
4 Mitas or Palams = 1 Kal
4 Kals = 1 Neli or Neliya
4 Nels = 1 Kuruni
4 Kurunis = 1 Droṇa
4 Droṇas = 1 Vaha
2 Palams = 1 Pregurta
2 Pregurtas = 1 Kuduba or Adamana

(c) "VAIDYALANKARAYA."

1 Sana = 15 Madetas or Maditiyas
60 Madetas = 3 Kalans
12 Kalans = A large Palam or Mita
48 Kalans or
Mitas = 1 Kuduba or Pata
4 Kudubas or
Patas = 1 Neliya or 16 Palams

16. Several specimens of the Maditiya seed have been weighed by Dr. Davy, the Ceylon historian, and were found to vary between 3 to 3·9 grains, averaging 3·6 grains. The weight of an "Olinda" or "Guṅgā" seed therefore becomes equal to 1·8 grains, which compares very nearly with the weight of the Indian Unit the "Rati." The generally accepted equivalent of the "lb. avoirdupois" is "8 Palams" or "2 Patas." The exact measure of these, on the basis of the "Mañchādiya" or the "Maditiya" being 3·6 grains is 0·99 lbs. avoirdupois.

17. A close comparison of these tables of weights, prevalent in India and Ceylon, discloses that the unit of all weights was the same in Ceylon as in India, viz., the "Rati," "Guṅgā" or "Olinda" seed, which are synonymous, its weight in Troy measure being 1·75 grains. The Ancients of India worked out its sub-divisions through their own cereals, leading to their smallest measure of weight the "Trasarenu," weighing only 0·0135 of a grain, and the Ancients of Ceylon, modelling
their systems of weights on the Indian lines but using their own local cereals, traced back their system of weights, through the “Vi-eta” and the “Amu” seed, to their smallest measure of weight, the “Tala-eta” or the “Gingelly” seed, weighing only 0.05 of a grain.

18. Passing now to the multiple weights of the Rati, whereas in India there was evolved a system of silver and gold measures of weight terminating in the Gold measure, the “Dharana,” the Ancients of Ceylon led their measures of weight through the “Palama” and “Tula” to a “Pata” and “Mita.” From thence onwards, when bulk became more easily measurable in terms of capacity rather than weight. the Ancients measured only in terms of capacity. Therefore it is, that the measures of Ceylon, whether according to the “Bhaisajyakal-paya” or the “Yogaratthakaraya” or the “Vaidyalankaraya,” all starting as measures of weight, terminate in the “Laha” and “Drōpa” which are measures of capacity.

19. Closer comparison of the various tables of weights and measures discloses differences which cannot be reconciled. For example there is the striking difference, that whereas according to the “Bhaisajyakal-paya” and the “Vaidyalankaraya,” a “Palam” is given as the equivalent of “12 Kalandas,” according to the “Abhidhammappadipikā,” a “Palam” is the equivalent of 10 Kalandas. These differences are explainable by the reason, that at no time in Ceylon was there a standardized table of measures, whether of weights or capacity. Each writer wrote for those of his own profession, or for his own particular purpose, and evolved his own table of measures. Each district had its own measures regardless of the measures in use elsewhere, the only common feature being the terms of measure, the reason for this being, that the same cereals were available in all parts of the country and the system of weights and measures was everywhere of the same origin, viz., Indian.

20. To a people who lived their entire lives within the narrow confines of their districts, and transacted the bulk of their business amongst themselves, or at the utmost only with their nearest
neighbours, the facilities for travel and transport being then most limited, it is not to be expected that the lack of an uniform system of measure was any very great inconvenience. So long as the unit of measure, the "Gunga" or the "Olinda" seed and the "Maditiya," remained the same, the relative measures were readily convertible one to another, within the limits of error permissible with so variable a unit as the Rati; different specimens of the seed being necessarily of different weights, but averaging about 1.75 grains.

21. It will be of interest to record here the comments of Mr. Edward Thomas, on seed grains as measures of weights, as the remarks would apply no less to Ceylon than to India. Mr. Thomas says "The insertion of the smaller kinds of seed grains . . . might at first appear to have been pedantic and purposeless, but in an essentially poor country, infinitesimal atoms of gold, gold dust or silver, in like minute proportions, entered largely into the dealings of a people just emerging from the primitive phase of barter . . . With these diminutive seeds at his command, the untutored villager had only to arm himself with the produce of his own fields, to check the deficiency in the fraudulent goldsmith's tale of weight, or the merciless discount of the money-changer, on the wear and depreciation of the currency. In a land where official standards must have been exceptional and difficult of access, this ready definition of denominations and interchangeable counterpoises, afforded by the seeds of the earth, must have proved next to invaluable. Hence we find, as the elaboration of these criteria inter se, that white mustard seed had to testify black, white poppy seed effected a prompt sub-division of either, and the average barley corn checked and determined the integrity of the 'Rati,' which again might be used in its turn to provide for the sufficiency of the 'Masha.' So that repeated averages of even such seemingly untrustworthy data might after all, produce comparatively crucial results."

MEASURES OF CAPACITY

22. (a) Passing now to measures of capacity, the "Abhidhammapadipikā" gives reference to the following Table of Measures:---
4 Pasatas or handfuls = 1 Pattha or Nelii or Neliya
4 Nelis = 1 Alhaka
4 Alhakas = 1 Dona
4 Donas = 1 Manika
4 Manikas = 1 Khari
11 Donas = 1 Amunam

(b) The following is a Table of Measures in common use in Ceylon:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Equivalent in Ceylon</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Hunduwas or Patas</td>
<td>1 Neliiya</td>
</tr>
<tr>
<td>4 Neliyas</td>
<td>1 Laha</td>
</tr>
<tr>
<td>4 Lahas</td>
<td>1 Timba</td>
</tr>
<tr>
<td>10 Lahas</td>
<td>1 Pela</td>
</tr>
<tr>
<td>4 Pelas</td>
<td>1 Amunam</td>
</tr>
</tbody>
</table>

23. The measures actually in use were only the "Neliiya" and the "Laha," the others being merely terms used for deriving the larger measures. The "Laha" was the largest dry measure and the "Neliiya" the largest liquid measure, this latter measure being used as both a grain and a liquid measure. For grain the "Neliiya" was sometimes made of rattan, but for oil it was always made of bamboo, being equal in capacity to the space contained between two consecutive joints of a bamboo, whence it derives its name "Neliiya."

24. The Neliiya measure appears to have been in existence even in ancient India, for according to General Cunningham's Archaeological Report for 1871-2 p. XI "the old measures are usually made of joints of bamboo or of iron, and more rarely of hard wood... The commonest name for one of the smallest measures is the Nelii."

25. Neliiya measures may be seen in every village, even today, and are actually in use. It may readily be imagined how varying this measure can be, depending as it must, on the size of the bamboo, and the length of the joint. Referring to this Pricham says as follows: "This measure varied and no two were to be found actually alike. When these measures prevailed, standard gauges were deposited for reference in every Kachcheri, as a protection against fraud through defective weights, a precaution absolutely requisite, where the natives would frequently place the measures in boiling water, then dry them in the sun, and
complete the roguery, by coating the interior surface with a thick layer of transparent dammer or pine resin."

26. The "Lāha" was also a measure of varying size. Within the same district and sometimes in the same Chief Headman's division, in different parts, a different size of Lāha was in use. In the North-Western Province alone, in different parts, there are in use even today, four sizes of "Lāhas" containing in capacity, 4, 5, 6 and 7 "Nēliyas" respectively. The largest size of 'Lāha' according to my investigations is one in use in the Inamaluwa Korale of Matale North, and contains twelve 'Nēlis'.

The various sizes of 'Lāhas' have in certain parts of the country different names. The 'Punchi Lāha' and 'Loku Lāha' are terms commonly used, and according to Pridham one and a half 'Punchi Lāhas' make a 'Loku Lāha'. Mr. M. S. Crawford, late of the Ceylon Civil Service, in his Grain Tax Settlement Report of Matale South, refers to a 'Kalawita Lāha'. This is a 'five Nēli-Lāha' and is so called as it was the 'Lāha' used in the threshing floors.

I should like to make mention here of two other measures, the names of which are of some interest. One is the 'Bandāra Nēliya' and according to Knox, this signifies the King's 'Nēliya'. This contained four 'patas', a 'pata' of grain being as much as a man can hold heaped up in his whole hand palm and fingers and all. The other measure is the 'Hambā Nēliya', which according to my information is a measure in use in the Dambulla Vihare and is said to hold three 'Nēliyas' of grain. It is said that the original 'Hambā Nēliya' which the Vihare used, was of the capacity of six 'Nēliyas' of grain.

The 'Lāha' is a large mouthed measure, rather in the shape of a small sized washing basin and generally made of 'Gansūriya' or 'Demata' wood. Mr. R. W. Ivers in his "Manual of the North-Central Province", states that in all agreements regarding grain, it is always stated how many 'Seers' or 'Nēliyas' the 'Lāha' is to hold when the measurement takes place—a very necessary stipulation in view of the varying sizes of 'Lāhas' in general use.
27. These measures have since been related to the English standard measures which, according to the Ceylon Blue-Book, are as follows:

1 Amunam = 4 Pelas
  = 40 Maharas
  = 8 Parahs
  = 5 Bushels or 160 Quarts or Seers or Neliyas

28. The "Parah" which is a Dutch measure, being adopted by Regn. No. 31 of 1816 as the standard measure, was defined as a perfect cube of internal side measuring 11.57 inches. The Parah was again divided into 24 "Seers," a "Seer", being a cylinder of equal depth and diameter measuring 4.35 inches.

29. The subdivisions and multiples of the "Parah" are as follows:

4 Cut Chundus = 1 Cut Measure
4½ Cut Measures = 1 Kuruni
2½ Kurunies = 1 Marsal
2 Marsals = 1 Parah
8 Parahs = 1 Amunam
9½ Amunams = 1 Last

30. The Cut Measure was legalised by the same Regulation, declaring that "the legal contents of the measure in all transactions should be those remaining in the measure level with the rim or edge, after the same had been struck or cut by a straight rod or 'strike,' mounted with iron, resting upon the edges."

31. The above table of measures in "Neliyas," "Lahas" and "Pelis," in varying forms, are still used in all villages of the Kandyian Provinces.

In the low country too, it is noteworthy, that in spite of the long periods of Portuguese and Dutch rule, the systems of measurement, as quoted above, still prevail. Apart from the introduction of measures of capacity such as the "Parah" and "Marsal," which appear to be the equivalent of the Tamil terms ("Parah" and "Marakkal"), the Portuguese and Dutch appear to have left the local measures uninterfered.

32. The Dry Measures in the Tamil District vary in the Northern and Eastern Provinces. According to the Ceylon Manual, the Tamil
measures of capacity and their relation to the English Bushel, as given in the Ceylon Blue Book, are as follows:

NORTHERN PROVINCE

Jaffna:

32 Quarts (or Seers) = 1 Bushel

(Note.—According to Mudaliyar C. Rasanayagam the system of measure prevailing in Jaffna from pre-British times is as follows:

12 Measures = 1 Lacham
2 Lachams = 1 Parah)

Vavuniya and Mannar:

16 Seers = 1 Marakkal
2 Marakkals = 1 Bushel

Mullaitivu:

12 Quarts (or Seers) = 1 Marakkal
2½ Marakkals = 1 Bushel

EASTERN PROVINCE

Batticaloa:

8 Cut Measures,
Seers, or 7
Heaped Measures = 1 Marakkal
4 Marakkals = 1 Bushel
7½ Bushels = 1 Avanam

Trincomalie:

12 Quarts = 1 Marakkal
2½ Marakkals = 1 Bushel
10 Bushels = 1 Avanam

Taupalakamam:

2½ Quarts (or Seers) = 1 Näli
15 Nälis = 1 Peddi
8 Peddis = 1 Avanam
1 Avanam = 10 Bushels

Koddiyappuram:

3 Measures (or Seers) = 1 Näli
15 Nälis = 1 Peddi
8 Peddis or 64 Marakkals = 1 Avanam
1 Avanam = 12 Bushels
Kadukkulam, (Tamil Villages):
5 Measures = 1 Näli
2 Nālis = 1 Marakkal
24 Marakkals = 1 Avanam
1 Avanam = 9 Bushels

Kadukkulam, (Sinhalese Villages):
6 Measures = 1 Marakkal
10 Marakkals = 1 Pela or Peddi
4 Pelas or Peddi = 1 Avanam

ANCIENT SURFACE MEASURES

33. I have made the above references in detail to the ancient measures of weight and capacity or dry measure, before discussing the Ancient Surface Measures of Ceylon, for the reason that surface areas were measured not by lineal or squared measure, but by a measure of the quantity of seed required to sow the land, i.e., "sowing extents." Thus it happens, that the definition of "surface extents" is in terms of grain capacity for sowing, or "sowing extents." The scale of measures is as given below and starts from a "Mita" or "fistful," a very appropriate measure as a sower sows in "fistfuls." The common local expression used to describe a man of straw, as a man not possessed of even "a Mita of land" has its origin here.

34. The following table is according to Modder in the Royal Asiatic Society's Journal:

4 Mitas = 1 Atalossa, i.e., handful with the fingers slightly bent inwards
8 Mitas = 1 Pata—a handful with the fingers stretched out
2 Patas = 1 Manawa or Dota or two handfuls
2 Manawas = 1 Neliya, Seruwa or Seer
4 Neliyas = 1 Kuruni or Lāha
4 Lāhas = 1 Timba
7 Lāhas = 1 Bushel
5 Kurunis = 1 Bera
2 Beras = 1 Pela
4 Pelas = 1 Amunam
6 Bushels (5½) acc. = 1 Amunam
35. The seed sown is also always stated—the commonest being Kurakkan and Paddy—high land generally being sown in Kurakkan and low land in Paddy. Thus it is, that we often have expressions such as "Ihalagederawatte of 2 pelas kurakkan sowing extent" and "Ihalagedera Kum-bura of 1 amunam paddy sowing extent." In areas such as the Kegalle District or the Central Province, where sometimes Elwi, a kind of paddy, is sown on high land too, the expression of high land areas in paddy sowing extents, is often encountered.

36. It will be obvious how difficult it is to correlate sowing extents accurately with surface areas, as there are so many variable factors, depending on the size and quality of grain, the peculiarities of the sower, the fertility of the soil, etc., which make any assessment of surface areas by sowing extents very doubtful of comparison. In fertile lands the seed would be sown much less thickly than in poor soil. An inexperienced sower would scatter the seed unevenly. No rigid correlation of surface areas by sowing extents is possible, and the amunam sowing extent consequently varies in different parts of the Island.

37. The system of surface measures in sowing extents does not appear to have been altered at all by the Portuguese or the Dutch, during the periods of their occupation. The Portuguese "Forals" and the Dutch "Thombos," particularly the latter, give reference to the areas of land in terms of sowing extents, i.e., Amunams and Kurunies. The Portuguese "Forals" and Dutch "Thombos" were registers prepared mainly for the purpose of taxation, and therefore they concerned themselves with only the produce of the land, and left apart the question of surface areas, these latter being merely recorded in the then established systems of sowing extents of Kurunies and Amunams. Such Dutch Thombos as are accompanied by plans, make reference to the extent in Dutch measures, together with a statement of the generally accepted sowing extent of the land:

38. In the Tamil Districts of Ceylon too, i.e., the Northern and Eastern Provinces, the system of land measurement would seem to have been in sowing extents, and this system still prevails except
in Jaffna, where in addition to the sowing measures, a surface measure termed the "Kuli" appears to have been in use from Ancient times. This measure, the "Kuli," is the extent of land contained within a square, of side equal to a "Kole" or pole, in length approximately equal to 12 ft.

39. Appendix A is a table shewing the usual assessment of sowing extents in acres, which is followed generally, but it is not rigidly adhered to and is always considered variable, depending on local information regarding the fertility of the soil, the violence of the wind, the water supply and various other factors which have to be taken into consideration on account of local conditions.

40. This practice of the measurement of surface areas in sowing extents is not by any means peculiar to Ceylon, and appears to be of Indian origin. I find the following quoted by Mr. E. Thomas as taken from "The Report on Kuma by G. W. Trail." "The mode of calculation of the measurement of land in use throughout the hills is, by the estimated quantity of grain which the land will require to sow it... The most common denomination is the ‘Bisi’ which has now been adopted as a general standard. The regular bisi ought, as its name implies, to contain land requiring 20 Nālis (nāli = a joint of bamboo) of seed. Its actual extent varies according to the quality of the soil, as the grain is sown much wider in poor lands near the summit, than in rich lands at the base of mountains..."

ANCIENT MEASURES OF DISTANCES

41. I will now deal with Ancient Measures of Distances, which are closely connected with land measures. These do not however directly affect the surface measures dealt with above, which constitute the main object of this paper.

42. The measurement of long distances in ancient times appears to have been merely an approximate estimation rather than an exact measure. The "Hetekma" or "Setekma" which is intended to be the English mile, is the distance which a man carrying a load can travel at one stretch before he needs a rest. The word "Hetekma" was derived from two words "Heti-Erima" which have now been abbreviated to the one word "Hetekma."
43. Similarly the term "Pillumak-dura," in use in some parts of the Island, represents about a mile or "Hetekma." This is 'the distance a pingo bearer is supposed to be able to travel without putting down his load. According to Mr. Modder, the following interesting explanation of this term is given by Mr. Herbert White, formerly of the Ceylon Civil Service. "Pillumak-dura" is derived from "Pili" meaning "a cloth," "Inuma" meaning "let loose" and "Dura" meaning "a distance." There is a custom among pingo bearers to tuck up the cloth. The whole cloth is tucked in to the waist when the pingo bearer starts his journey, but it gets loose and falls down little by little as he goes along. When the tucked up portion has fallen right down, and the man is obliged to stop and tuck it up again, he is said to have walked a "Pillumak-dura." This is regarded as being the equivalent of an "Hetekma" or an English mile.

44. The following are terms in general use, which are measures of distances, gauged more by sound than by eye:—

(a) "Anda Saddeka Dura" meaning the distance at which one can hear another talking in normal tones.

(b) "Haiyan Katakerana Saddeka Dura" meaning the distance one can be heard when talking aloud.

(c) "Hoo Saddeka Dura" meaning the distance a "Hoo" cry can be heard.

(d) 'Pinmaka Dura', meaning the distance that an adult could jump from a standing position.

(e) 'Iyaka Dura' meaning the distance of a Bow Shot.

(f) 'Viyagahaka Dura' meaning the distance of a yoke.

(g) 'Estdistiyaka Dura' meaning the farthest distance an object could be clearly distinguished with the naked eye.

(h) 'Bera Saddeka Dura' meaning the farthest distance at which the beat of a tom-tom could be heard. It is said that the Kings of old, sometimes fixed the boundaries of lands granted by them, by this measure
45. The best known and most commonly used of these is the "Hoo Saddeka Dura." The "Hoo Sadde" is a peculiar monosyllabic, high-pitched cry or call, which is almost a "Yodle" and is easily recognisable all over the country. Pridham reckons the distance of a "Hoo Sadde" as half an "Hetekma" and four "Hetekmas" or eight "Hoo Sadde Duras" a "Gauva," and five "Gauvas" or forty "Hoo Sadde Duras," as making a day's journey, varying from twenty-five to thirty English miles. Dr. Andreas Nell gives me the interesting information that a 'Gauva' was regarded by the ancients as the distance which a bullock could travel without being unyoked, a very significant explanation, as the word 'Gava' is used in the Sinhalese language as meaning a bullock.

46. Sir Emerson Tennent also refers to other terms in common use, viz., a "Dog's Bark" and a "Cock's Crow," each indicating a distance of a quarter of a mile or so.

47. An ancient term of distance often encountered is the "Yojana," sometimes also referred to as a "Yojuna" or "Yoduna." Mr. T. W. Rhys Davids after an elaborate comparison of the distance in miles, between several places mentioned in ancient historical works, which quote distances in terms of "Yojanas," has arrived at the distance of the "Yojana," as averaging about seven to eight miles.

CONCLUSION

48. I would wish in conclusion to state how difficult it is to obtain any local information on the subject of the ancient systems of Measure. Local knowledge is fast dying out. Such information as I have been able to gather locally has been very vague. In reply to enquiries I have made in different parts of the country regarding Ancient Measures, the information obtained, although meagre and difficult to correlate, shows definite connecting links with the Tables of Measures I have quoted, as taken from the several Ancient Medical Works, from Modder's article on "Ancient Measures of Weight" appearing in the Royal Asiatic Journal, and from other authorities such as Moggallāna's "Abhidhammappadipikā." The fact that local knowledge is fast disappearing is an indication of the necessity for a careful study
of the subject, with a view to promoting discussion; and recording the information still available, which might otherwise soon be untraceable. I would therefore invite the fullest possible discussion of the subject matter of this paper, and in doing so would express my regrets for its deficiencies, my acknowledgements to the authorities quoted, and my apologies for any errors of opinion that may have been expressed by me.

APPENDIX A.

The following is a very general statement of the equivalent extents in acres of the sowing extents in various parts of Ceylon:—

I. Central Province.

1. Dry Zone.
   (a) Paddy sowing (Mud land)
       1 am = 2 acres
   (b) Kurakkai sowing (High land)
       1 am = 30-40 acres

2. Wet Zone.
   (a) Paddy sowing (Mud land)
       1 am = 2 acres
   (b) Paddy sowing (High land)
       1 am = 2-4 acres

II. Sabaragamuwa P.

1. Wet Zone.
   (a) Paddy sowing (High land)
       1 am = 4-5½ acres
   (b) Paddy sowing (Mud land)
       1 am = 2½ acres

2. Dry Zone.
   (a) Paddy sowing (Mud land)
       1 am = 2 acres
   (b) Kurakkai sowing (High land)
       1 am = 30-40 acres

III. Uva Province.

1. Wet Zone.
   (a) Paddy sowing (Mud land)
       1 am = 1 acre
   (b) Kurakkai sowing (High land)
       1 am = 13½ acres
2. **Dry Zone**
   (a) Paddy sowing (Mud land)
       1 am = 1½ acre
   (b) Kurakkan sowing (High land)
       1 am = 30-40 acres

IV. North-Western Province and North-Central Province.
   1. Paddy sowing (Mud land) 1 am = 2½ acres
   2. Kurakkan sowing (High land) 1 am = 40 acres

V. Southern Province.
   1. **Wet Zone.**
      (a) Paddy (Mud land) 1 am = 2 acres
      (b) Paddy (High land) 1 am = 4 acres
   2. **Dry Zone.**
      (a) Paddy (Mud land) 1 am = 2 acres
      (b) Kurakkan (High land) 1 am = 30-40 acres

VI. Western Province.
   1. Paddy sowing (Mud land) 1 am = 2½ acres
   2. Kurakkan sowing (High land) 1 am = 40 acres

VII. Northern Province (Taken from the Ceylon Blue Book for 1934).

**Jaffna.**

\[
\begin{align*}
12 \text{ kulis} & = 1 \text{ lacham} \\
24 \text{ lachams} & = 1 \text{ acre} \\
18 \text{ kulis} & = 1 \text{ lacham} \\
16 \text{ lachams} & = 1 \text{ acre}
\end{align*}
\]

{Paddy cultivation}

{Varaku cultivation}

**Mannar.**

\[
2 \frac{1}{2} \text{ bushels} = 1 \text{ acre}
\]

**Mullaitivu District.**

**Maritime Pattus.**

6 marakkals = 1 acre

**Vavuniya North.**

5 marakkals or 2 bushels = 1 acre
Vavuniya South.

2 bushels = 1 acre

VIII. Eastern Province. (Taken from the Ceylon Blue Book for 1934).

Batticaloa.

(a) Wet cultivation.—The seed paddy raises from 2½ bushels in low land to 3½ bushels in high land per acre.

(b) Dry cultivation.—Fine grain 2 measures per acre; Indian corn 2 measures per acre.

Trincomalie.

12 quarts = 1 marakkal
6 marakkals = 1 acre
4 acres = 1 amunam

Tampalakaman.

1 avanam = 5 acres in Tampalakaman
= 4 acres in Kantalai
= 3 acres in Kiniyai

Koddiyar.

15 nālis = 1 peddi or ¼ acre
2 peddis = 3 bushels, 2½ for mud lands or 1 acre

1 avanam = 4 acres

Kaddakulam East (Tamil villages).

2½ marakkals = 1 bushel
2½ bushels = 1 acre