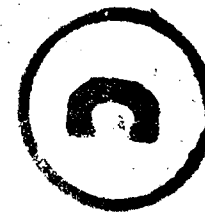


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The Madras Geographical Association

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**Proceedings of the Second Annual Conference
of the Madras Geographical Association**

The Second Annual Conference of the Madras Geographical Association was held on the 20th May 1931 and the succeeding three days at the long hall of the Victoria College Buildings, Palghat, under the presidency of M. R. Ry. V. Rangacharya Avergal, M.A., L.T., Professor of Indian History, Presidency College, Madras.

Besides the following members of the Association there was a large gathering of visitors:—Messrs. Rao Sahib T. S. Subramania Iyer (Madras), K. N. Krishnier (Palghat), M. S. Sabesan (Madras), A. L. Sundaram (Karur), V. Guruswami Sastri (Tirukattupalli), G. Narayanaswami (Madras), K. R. Sundaramurti (Pollachi), V. K. Souri Rajan (Madras), Syed Ameeruddin (Nandyal), V. K. Ramier (Palghat), S. Natarajan (Madras), Achutan Nair (Erode), K. R. Lakshmana Iyer (Bhavani), A. Appadorai (Madras), M. Narayana Menon (Palghat), M. Sivarama Menon (Alattur), K. Jogiah (Madras), K. L. Ramaswami Iyer (Ottapalam), V. A. Ramanujulu Naidu (Palghat), P. S. Srinivasa Iyengar (Karur), N. Subrahmanyam (Madras), S. S. Krishnaswami Iyer (Karur), P. K. Pisharodi (Palghat), T. M. Paramesvaran (Kollengode), Abdul Hamid (Calicut), C. S. Anantaramier (Cherukunnu), A. Rangaswami Ayyangar (Madras), T. Srinivasachari (Pudukottah), N. R. Ramaswami Iyer (Palghat), K. Ramaswami Iyer (Pudukottah), M. Venkatramier (Madras), Mrs. Chinnamu Manadisiyar (Palghat), Miss Madhavi Bai (Ottapalam) and Miss Parukutti Ammal (Palghat).

At 12 Noon on the 20th May 1931, the proceedings commenced with a short Welcome Address by the Chairman of the Reception Committee, Mr. M. Narayana Menon, B.A., B.L., Vice-President, Malabar District Board.

Welcome Address.

In the course of his speech Mr. Narayana Menon said :—

“To you, who are in quest of Geographical and Historical truths, this country of ours will prove to be an emporium. It will present puzzles to the ethnologist, the geographer and the historian. I am sure an honest attempt to solve the many problems connected with Malabar will reduce intellectual unemployment among you for one or two generations.

“I am not, however, competent to formulate before you the various points of geographical and historical importance which should engage your attention. To students of science like you problems will present themselves for solution. Thanks to the labours of the Madras Geographical Association and to the deep interest taken in the subject by Mr. N. Subramania Iyer and others, geographical studies are gaining a remarkable pace in our presidency. We are probably trying to compensate in a way for our past neglect of a science which is intimately connected with the relationship between man and his environment.

“It is therefore with sincere pleasure that I, on behalf of the Reception Committee, offer you a hearty welcome.

M.R.Ry., Rao Saheb T. S. Subramanya Ayyar Avergal, President of the Madras Geographical Association, in a few prefatory remarks referred to the kind of work hitherto done by the Association giving an idea of its usefulness and its scope.

On the motion of Mr. V. Guruswami Sastriar of Tirukattupalle High School, seconded by Srimathi V. Chinnamu Mannadisaiyar and supported by Mr. M. S. Sabesan, Lecturer, Madras Christian College, Professor V. Rangachariar was installed in the Presidential Chair amidst acclamation.

The President, after thanking the Assembly for the great honour done to him, delivered a lengthy address, already published in the previous number of the Journal. (Vol. VI, No. 2).

After the Presidential Address was over the following papers were read and discussed on this and the following three days :

1. *A Note on the Physical Geography of Malabar* : by T. N. Muthusawami, M.A., L.T.
 2. *Geology of the Palghat Gap* : by Mr. M. S. Subramanyam B.A. (Hons.).
 3. *Meteorology of Malabar* : by Mr. B. G. Narayan, B.Sc.
 4. *Types of Forest Flora in Malabar* : by Mr. G. Viswanatham, B.A.
 5. *Agricultural Geography of Malabar* : by Mr. V. K. Sourirajan, M.A., L.T.
 6. *Field Irrigation in Malabar* : by Mr. A. Swaminatha Iyer, B.A.
 7. *Pepper in Malabar* : by Mr. M. Achyutan Nair, B.A., L.T.
 8. *Some Medieval Notices of Malabar Pepper* : by Mr. A. Appadorai, M.A., L.T.
 9. *Marketing of Malabar Produce* : by Mr. K. C. Ramakrishnan, M.A.
 10. *Cottage Industries of Malabar* : by Mr. R. Suryanarayana Rao, B.A.
 11. *A Note on the Population of Malabar* : by Mr. K. Srinivasa Raghavan, M.A.
 12. *Urban Geography of Malabar* : by Mr. R. Dann, M.A.
 13. *A Note on the Physical Geography of Calicut and its Environs* : by Mr. N. Subrahmanyam, M.A., L.T., F.R.G.S.
 14. *Communications of Malabar* : by Mr. N. Subrahmanyam, M.A., L.T., F.R.G.S.
 15. *Public Health of Malabar in Relation to Environment* : by Major A. M. V. Hesterlow, I.M.S.
 16. *Trade-Centres of Malabar in Roman Times* : by Mr. P. J. Thomas, M.A., D. Litt.
 17. *Relation between the Tamils and Malabar at various Epochs* : by Mr. Rao Saheb C. M. Ramachandra Chettiayar, B.A., B.L.
 18. *Some Place-Names of Malabar* : by Mr. P. Rama Pisharodi.
- On the morning of the third day (22-5-31) there was an excursion to the Dhoni Hills. On the hill top Rao Sahib T. S. Subramania Iyer gave an interesting talk on “Modern Types of Transport.” Members also visited in groups places of interest in and around the city such as the Fort, Tile Works, Sabari Asram, etc.

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On the last day (23-5-31) at 10 A.M., after the reading and discussion of the several papers were over, the President of the Association thanked the members of the Reception Committee for the excellent arrangements they had made for the delegates of the Conference.

Mr. Narayana Menon, Chairman of the Reception Committee congratulated at the outset the President Mr. V. Rangacharya for his valuable opening address and the encyclopedic knowledge that was in evidence in every one of his interesting remarks on every paper that was read at the Conference. He, however, felt sorry that time was not found for reading all the papers in the Conference itself. He was of opinion that the Conference was of a scientific character and that its value lay not so much in its large audiences as in the discussions which followed every paper and the sum total of knowledge of a geographical character which the Conference brought to light. He thought that the dignity of the Conference would be enhanced and sufficient time would be available for reading all papers, if the Annual Geographical Conference met as a separate entity. He realised that that would not be possible without adequate reserve funds. He, therefore, exhorted the members of the Association to help the Secretary in increasing the Corpus of the Association. He also made an appeal to the Government and to the local bodies to lend their financial support to this premier Geographical Association of India.

He desired that the Association should, when funds permitted, charter a motor wagon which, with an adequate supply of films, pictures, etc., should tour round the various districts of the presidency creating everywhere an atmosphere conducive to the spread of geographical knowledge. Incidentally valuable data based on personal knowledge, may be gathered.

Finally, he congratulated the Secretary of the Association on the excellent pioneering work he was doing for a valuable commercial subject like Geography. So intense and so widespread has been his work that everywhere he is known as "Geography Subramania Iyer". The Association was fast becoming an institution and hence he would like Mr. Subramanya Iyer gathering round him a body of enthusiastic workers. He would even go to the extent of asking him to train up and prepare a successor who would carry on the torch so brightly lighted by him.

Mr. N. Subramanya Iyer, the Secretary then said that it was his pleasant duty to offer his sincere thanks to the President for his so ably guiding the proceedings of the Conference. He next conveyed his thanks both as Secretary and in his personal capacity to the Chairman, Reception Committee for contributing very much to the success of the Conference. He also made references to the many other gentlemen who made it a point to participate in the proceedings of the Conference in spite of other engagements or inconveniences.

He, then, referred to the urgent need for financial assistance and sympathy not only on the part of the teachers of Geography or Government or local bodies but on the part of the general public. He was glad to announce that the Association has passed through the first stage of its existence; for, for the first time during the six years of its life a net saving of over 500 rupees has been made. Hereafter the creation of a local habitation for the Association must be our first charge. As in the case of similar Associations on the west it is only then that the usefulness of the Association may be increased by organizing a geographical museum and a library of reference books on the subject.

He agreed with the Reception Committee Chairman that the Conference was not meeting independently, but he did not regret it. The Association had decided, voluntarily for many more years to come to meet under the "protecting wings of the South Indian Teachers' Union." For one thing there is greater scope to influence a larger body of non-members in the work of the Association. Secondly, it enables the members of the Association to visit every district in the Presidency and incidently make a study of the various aspects of the Geography of that part of the Presidency. Moreover a lot of worry connected with arrangements for the conference is saved for the Reception Committee. He, however, promised to place before the Working Council of the Association the advisability of finding time for reading all the papers in the future conferences of the Association.

He, then, made an earnest appeal to the local branch to carry on the work of the Conference. More members might be brought in, but what was needed most was a study of the many problems about which papers were not read at the Conference.

Once again he thanked everyone, the President, the Chairman, Reception Committee, members and visitors who had very much lightened his work by their kindness.

President's Concluding Address.

In the course of his concluding speech the President congratulated the authors of the various papers who had brought to bear on the several subjects their special knowledge and thereby made the Conference a great success. He, however, felt that the people of the district with an intimate knowledge of the locality dealt with, had not taken a more prominent part in the preparation of the papers read at the Conference. He hoped that this defect would be rectified, if possible, in the future Conferences of the Association.

He paid a warm tribute to the energetic and enthusiastic Secretary of the Association who by organizing this Conference has brought out a symposium of special articles on the district which forms, as it were, a companion volume to the District Gazetteer. He would suggest to the local branch of the Association to continue the work where the Conference has left it and arrange to get special papers prepared on those other aspects in the life of the District not touched upon in this Conference. He hoped that in this way, the Association would in the course of a few years complete a geographical survey of the Presidency, if not of South India.

After recalling some personal reminiscences of his own, while he was serving in one of the local schools, he thanked the Chairman and members of this Reception Committee and that of the Conference of the South Indian Teachers' Union for making the stay of the members of the Association so pleasant and happy.

Vote of Thanks

With a vote of thanks proposed by Mr. K. C. Ramakrishnan (Madras) and seconded by Mr. G. Narayanswami (Madras) the Conference came to a close.

A Note on the Physical Geography and Geology of Malabar

By Mr. T. N. Muthuswami, M.A., L.T.

Lecturer in Geology, Engineering College, Guindy.

The district of Malabar, besides comprising Malabar proper which extends from north to south for a distance of approximately 150 miles, between N. lat. $10^{\circ} 15'$ and $12^{\circ} 18'$ and E. long $75^{\circ} 14'$ and $76^{\circ} 56'$, comprises of small bits of territory of the Native States of Cochin and Travancore and about fourteen islands of the Laccadives.

The trend of the coast-line is from N. N. W. to S. S. E. The country rises gradually to the west; but near the Ghats for a distance of five to ten miles, it is fairly flat. The distance between the coast line and the Ghats on the north is about 20 miles; gradually the Ghats get further and further from the coast till on the southern extremity of the district they are nearly 50 miles from the sea. This belt of land between the coast-line and the Ghat may be divided into four longitudinal tracts: First, a region of sea cliffs; second, a tract consisting of low hills and valleys; the third is characterised by deeper and narrow valleys which occasionally reach a depth of 500 ft. and with well-developed terraces, and the fourth region is a flat and low country abutting the Ghats. West of the coast the continental platform is gradually shelving down. The backwaters of the district and the Palghat gap are the most striking topographic features of the country. The backwater system of the district, though not so well developed as in the Travancore State, yet forms a very important means of communication affording also facilities for irrigation.

Mountains—The Western Ghats is a continuous chain with a gap, however, for a distance of about 20 miles which is the Palghat gap. The highest peak in this range is the Mukurti Peak of 8,300 ft. on the Nilgiri-Malabar boundary. The Vellera Mala is about 1,000 ft. less in height. The Anginda Peak on the southern edge of the Nilgiri plateau is 7,828 ft. high; the Camels' Hump

at Wynand is the only other one over 7000 ft.; the two peaks of lesser magnitude between 6,000 and 7,000 ft. are the Balasur Peak and the Karimala. The rest range from 1,500 to 5,000 ft. in height.

In striking contrast to the Ghats are the small hillocks studied throughout the district reaching occasionally a maximum height of 700 feet. These are covered by laterite.

Rivers.—The rivers of Malabar have, as naturally to be expected, their origin mostly in the Western Ghats. Very few exceed a length of 100 miles. The most important rivers are the Ponnani, the Beypore River, the Kadalundi and the Vellarapatnam rivers. Of these, the Beypore river and the Vellarapatnam river discharge a large volume of water as their catchment area lies in the portion of Ghats fully exposed to the south-west monsoon; the Ponnani, coming as it does, from the plains of Coimbatore, is less exposed to the monsoon and its volume is the least. There are numerous other minor rivers like the Alimala, the Thaliparamba, the Kallai and the Kota, which afford facilities for irrigation along their courses. In this connection may be noted the Chevakkad backwater, the longest in the district which joins the Velliankod backwater. This receives its supplies during the rains. The water is very carefully stored for cultivation. The Trichur lake is an equally important reservoir. This is about 25 sq. miles. Much of it lies within the Cochin territory. Here again the water that is stored during the monsoon is used for irrigation.

Geology.—The geology of Malabar is made up of three formations. They are the gneisses, the laterites and the recent deposits.

The gneisses vary from coarse to fine-grained types, hornblende varieties predominating; the garnetiferous ones show affinities with the Nilgiri type; Haematite and magnetite quartzite are common. Granitoid gneisses are rare. The relationship of one gneiss to another has not been fully investigated. Intrusive into these gneisses are observed dykes, particularly at Manjeri, Waliyar, Tritala and Anangamala. Not much is known of the character of these rocks.

The laterites cover practically the whole district except along the coast where they are scanty. The laterites of the plateau are called plateau laterites, while those in the valleys and terraces are

named valley laterite and terrace laterite respectively. The plateau variety is obviously the oldest; for after the plateau was carved into valleys and gorges, the material that got accumulated consolidated to form the valley and terrace varieties. While the plateau laterite is vesicular, the terrace and the valley types are pellety; the last two are called detrital varieties to distinguish them from the plateau type which is formed in situ.

The recent deposits as noted in the section of river valleys are loose sand-stones to a depth of about ten feet beneath the alluvium; and beneath the sand-stone layer there is a gritty sand-stone formation of about 20 ft. depth with thin partings of peat and clay. This last formation gradually merges into the laterite that covers the gneisses.

Physiographical History.—The Western Ghats are composed of the Deccan type of rock on the north of Malabar and charnockite on the south. It is obvious that for long ages denudational agencies have been at work to make the mountain what it is. It is a relic type of mountain. The direction of the flow of rivers on to the east and west of the range indicates that the Ghats formed the line of watershed in pre-tertiary era. During the secondary period there are considerable evidences—geological and biological—to show that India was connected with South Africa through Madagascar. Towards the close of the secondary era linear tracts of this land got sunk to considerable depths. It was during this time the Arabian sea was getting formed consequent on the sinking of the tract of land that connected India with South Africa. This subsidence should have been accompanied by a tilting and to this may be attributed the higher level of the Ghat region. The once continuous chain of Nilgiri and Anamalai ranges probably got removed from each other during this period by a fault, paving the way to the formation of the Palghat gap. As already mentioned, the continental platform towards the west is a gentle sloping one, while to the east of the Laccadive Islands the depth of the sea is considerable on the eastern coast. This may also be due to one such fault. The backwaters probably mark the trend of strike faults of this age.

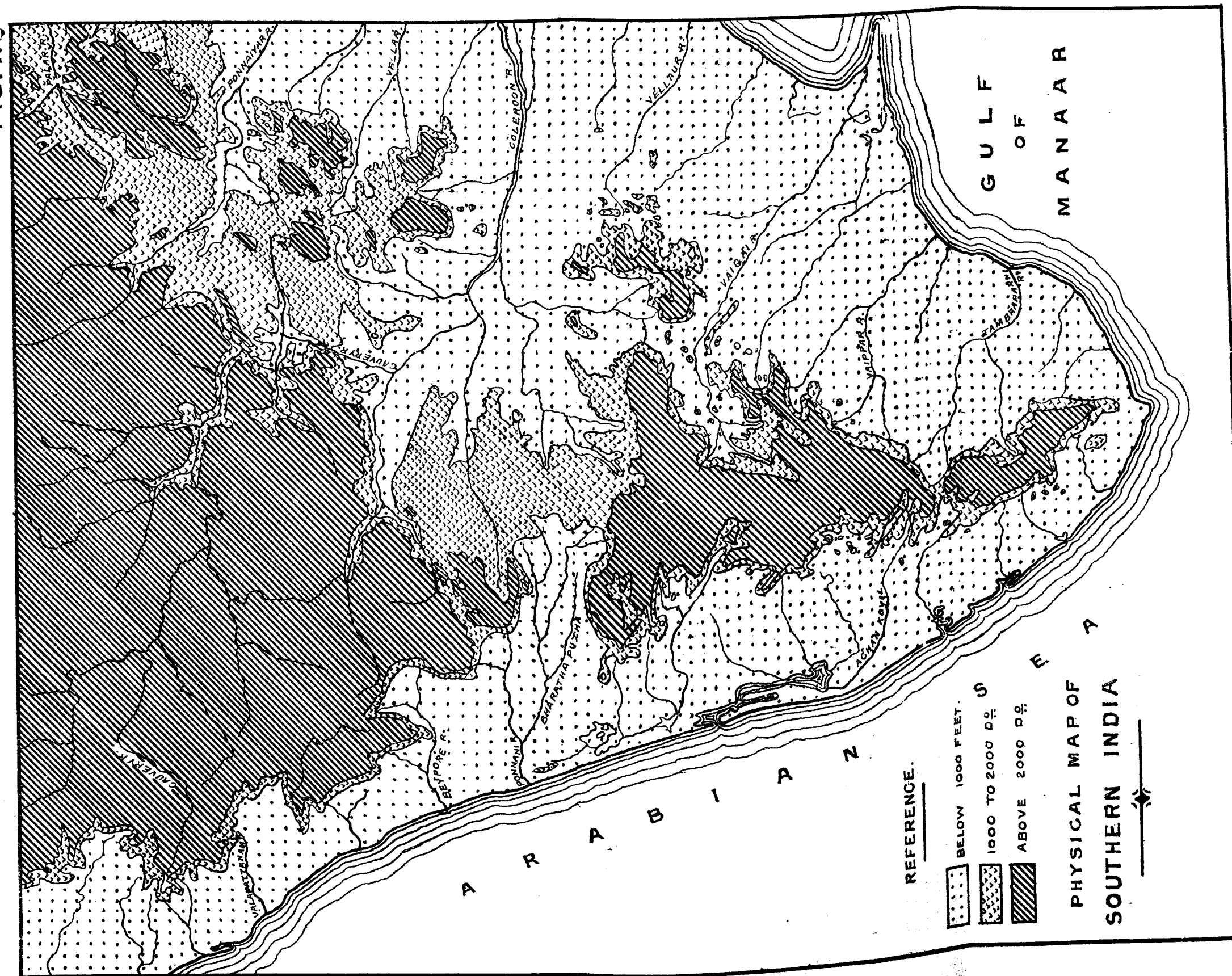
It has been made out that before the laterite period the sea washed the foot of the Ghats. During this period those small hillocks, which are now 500 ft. and over, jutted out in the form of

small islands. With the gentle rise of the land these isolated islands became united to form the highest part of the plateau. The sea was gradually receding towards the west. Before the coast assumed its present outline there was a period when the valleys of the Beypore and Ponnani rivers were covered by the sea; further rise of the land resulted in driving the waters towards the west. Simultaneously there would be forming small rills in the tract of land between the present Beypore and Ponnani rivers; and these would have supplied fresh water to these two rivers. The northern direction of many of the feeders of the Beypore river and the southern direction of the feeders of the Ponnani confirm this view.

As the land rose above the sea the gneisses got lateritised. The valleys near the mouth of the rivers are shallow and broad; but the gentle rise of the land probably rejuvenated the streams near the source, allowing them to cut the country into the deep gorges that we see at present. That Malabar is a plain of marine denudation can be made out further by marine shells which have been obtained from borings made at the bed of the Kallai river; and at Kuttipalli a village 250 ft. above sea-level and on hills east of Ferokh, quite a large number of estuarine bivalve molluscs are noted.

Economic Geology.—The presence of gold in the sand of the rivers is often met with. Attempts have been made to work the auriferous localities at Wynaad but with little success, partly owing to want of easy means of communication and partly owing to the malarial nature of the country. Iron and manganese have been reported from Ernad taluk; want of cheap power stands against commercial utilization in the place; they are not in such quantities as to compete with those obtained from other places. The laterites are used throughout the district as building stones. The bed is useful in that it is the water-bearing stratum of the district.

FIG. 1.2



Geology of the Palghat Gap

By Mr M. S. Subrahmanyam, B A, (Hons.).

The Palghat Gap is a great chasm in the wall of the Western Ghats in the Madras Presidency at latitude $10^{\circ} 45' N$ and longitude $76^{\circ} 43' E$. It is about 15 miles in average width from north to south and is about 20 miles long from east to west. It is about 28 miles at its debouchment on the west when it opens upon the Malabar coast and is 22 miles wide on its eastern side when it debouches on to the Coimbatore plain, and between these points its width is irregular, but it narrows in some parts to 8 or 9 miles. The general slope of the pass is from east to west as is evidenced by the flow of the rivers in the gap. An examination of the contours gives us a clear idea of the nature of the Gap in relation to its adjoining areas. The 200 ft. contour marks the western margin of the gap where it merges into the western plain, while the 800 ft. contour marks its eastern limit. A gradual rise in elevation is noticed as we go from west to east. The 500 ft. contour is of great importance to us and its situation towards the eastern extremity is noteworthy. The swing of the contours resembles the Tamil letter Pa (ω) with its base facing west (2).

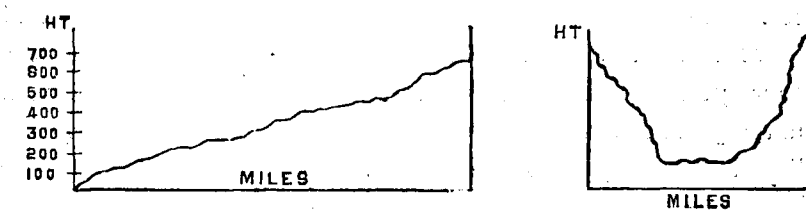


Fig. 1

The contours on the sides are aggregated together and the slope is rather steep. The diagrammatic sketches of the longitudinal and transverse section elucidate the facts. (Fig. 1)

The surface and lower flanks of the Ghats on either side are covered with elephant jungle and thickets of bamboos growing in a thick reddish grey soil. Glimpses are occasionally obtained of the lofty heights of the Nilgiris and the Koondas which flank the right side of the mountains in passing through the foot

hills and of the mountains which resume the rise of elevation on the left. The bottom of the pass is a plain with gentle undulations of ridges running parallel with the line of elevation. The ascent from Coimbatore and the descent to the coast on the other side are so gentle that we can conceive it probable that the height of the pass never much exceeded that of Coimbatore itself. Down the middle of the pass winds the Ponnani river to the Malabar Coast and on to the Arabian Sea. It is formed by rills from the Ghats uniting in the centre of the pass west of the main watershed.

Geology.—According to Mr. Newbolt the rocks observed in the pass were chiefly gneiss and hornblende schist, massive hornblende rock, and a small-grained quartz granite with black mica and hornblende. Stratified gneiss with the strike of stratification of W. 5° N, and a dip of 80° in the direction S. 5° E was also observed. According to the reports of various observers the rocks on the northern side show ample evidence of shearing.

The surface soil is ash grey in colour, soft and friable to touch. Around protruding rocks reddish alluvium and detritus is seen. The sub-soil is a bed of angular gravel; and also beds of kunkur and clays are seen. Wind-blown sands and aeolian deposits are fairly common with occasional dust storms. In the valley of the rivers we find laterites of detrital origin resting on the gneiss. These valley laterites occupy great elevated river terraces. Large well-rounded pebbles of quartzite and granites at heights far above the present level of rivers indicate the existence of more powerful and broader rivers in the recent Geological past. The temples are built mainly of laterite. Granite is scarce in the valleys and usually lies at a distance. Regarding fossils and their evidence, certain shells of the *Gymno-conchus* variety of a littoral type, now found at different heights in the Western Ghats in the neighbourhood of this region, should have evolved out of a marine type into fresh water ones by adaptation to environment, bearing evidence regarding the marine invasions of the region in the past.

Having considered the nature of the country in the region around Palghat we should consider its position in relation to the land forms in the neighbourhood. If we draw a section of Asia from the Himalayas to the Indian Ocean along the west coast o

India, we find two depressions in an almost uniform, elevated table-land of S. India. One such feature is occupied by the depression of the gap enclosed by mountains rising to an elevation of about 8,000 ft. and the other depression is occupied by the strait between India and Ceylon. Beyond the strait the elevation is carried up to 8,000 ft. reached by the peak of the mountains in Ceylon. It is an interesting feature to note that Geologically the rocks of Ceylon and South India are of exactly the same type and origin. It is possible to suppose a period in the Geological history of S. India when the almost unbroken chain of Western Ghats extended right up from the Vindhya mountains on the North down to Ceylon and beyond, when there was no break or great depression in it. If such a thing did exist what was the force which gave rise to dislocation of its uniform elevation? The answer to this question has to be sought in the various features left around the region in question. Newbolt aptly observes as follows: "The Palghat gap is evidently a combination of the Salem and Nilgiri break near the southern base of the Deccan Table-land. It would almost seem that the strata of crystalline schists had been here broken asunder across their direction and to their very foundations by the unusual energy evinced by the upheaving forces in the neighbouring elevations of the Western Ghats, viz., those of the Nilgiris and the Koondas and that the shattered sides of this great rift had been swept away and its aspect modified by the current of the retreating ocean, above whose waves the granitic and hypogene summits of the Ghats then emerged." Mr. Blanford further comments on this in his *Manual of Geology of India* thus: "It is also possible that the isolation of the different hill ranges of South India, *e.g.*, Sherveroys, and the denudation of the Palghat gap south of the Nilgiri plateau are due in part to ancient marine action of the same date as the formation of the Sahyadri escarpment."

Everyone familiar with the Geological history of the Earth knows that there existed formerly a continent known as the Gondwana land extending from the Brazilian shield of S. America through the Central African shield and South India, down to the Australian shield. Owing to the great changes taking place inside the earth this continent broke up at about the latter half of the Mesozoic Era. Prof. Gregory in his "General Stratigraphy"

says: In most parts of India, South Africa and Australia land conditions persisted in the Jurassic age and coal-fields occur in each country. The disruption of the Gondwana land had, however, begun and arms of the sea penetrated it from both the Tethys (northern ocean), of which the Mediterranean sea is a remnant on the north, and the southern ocean...Africa was still united to Brazil, India and Australia.' Accordingly we can expect the changes in the landforms to have taken place sometime about the end of the mesozoic era.

When the breaking up of the continent took place, South India was separated from Africa on the west and Australasia on the east. The nature of the shattering seems to have taken place in the form of great rifts or faults and the land masses thus broken drifted away from one another. Thus on this hypothesis we can trace the history of the Gap under the following main divisions:

(1) The breaking up of the great continent of Gondwanaland by the eustatic movements, along lines of weakness.

(2) Secondary shattering of the edges of the blocks thus separated forming continental islands like Ceylon in the Indian block, Tasmania and New Zealand in the Australian block and Madagascar in the African block.

(3) As a result of the secondary shattering minor and major rifts develop parallel to the main axis of secondary shattering strong enough to produce a rift restricted to superficial crust and not powerful enough to separate blocks of land to form islands as in the case of No. 2. Such rifts are seen in Africa, India and Australia.

(4) The rift can be traced from the Palghat Gap right up to Salem and the Sherveroys and is possibly a continuation of the rift which caused the sinking of the block in the Bay of Bengal as it is almost parallel to the coast of the Northern Circars. A. N. E. to S. W. direction can be given to this faulting. The valley of the Cauvery between Erode and Salem can be supposed to be a remnant of the rift continued north-eastwards from the Palghat Gap.

(5) Denudation of the land in the line of weakness thus developed by various streams. A remnant of one such valley is

FIG. 43

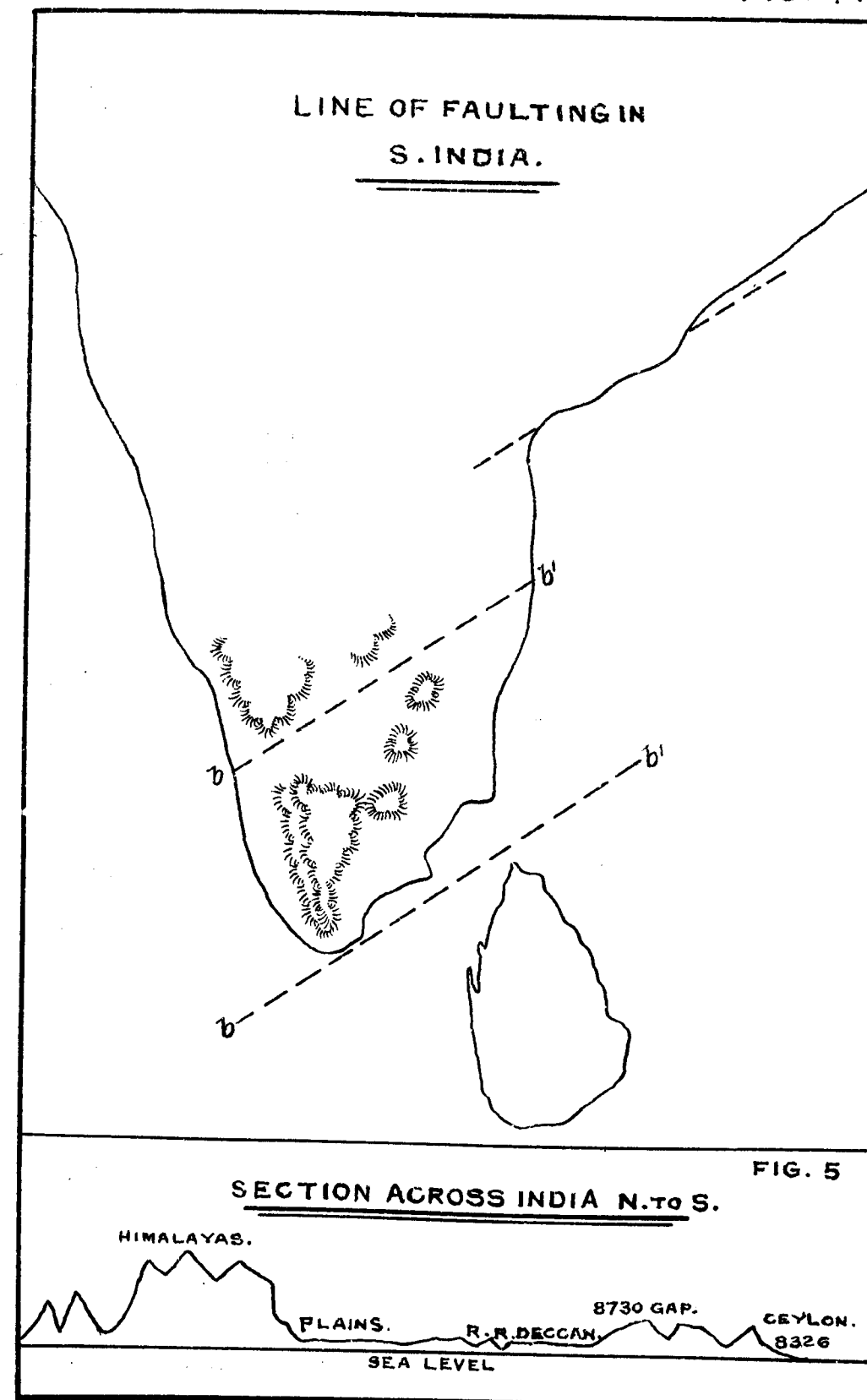
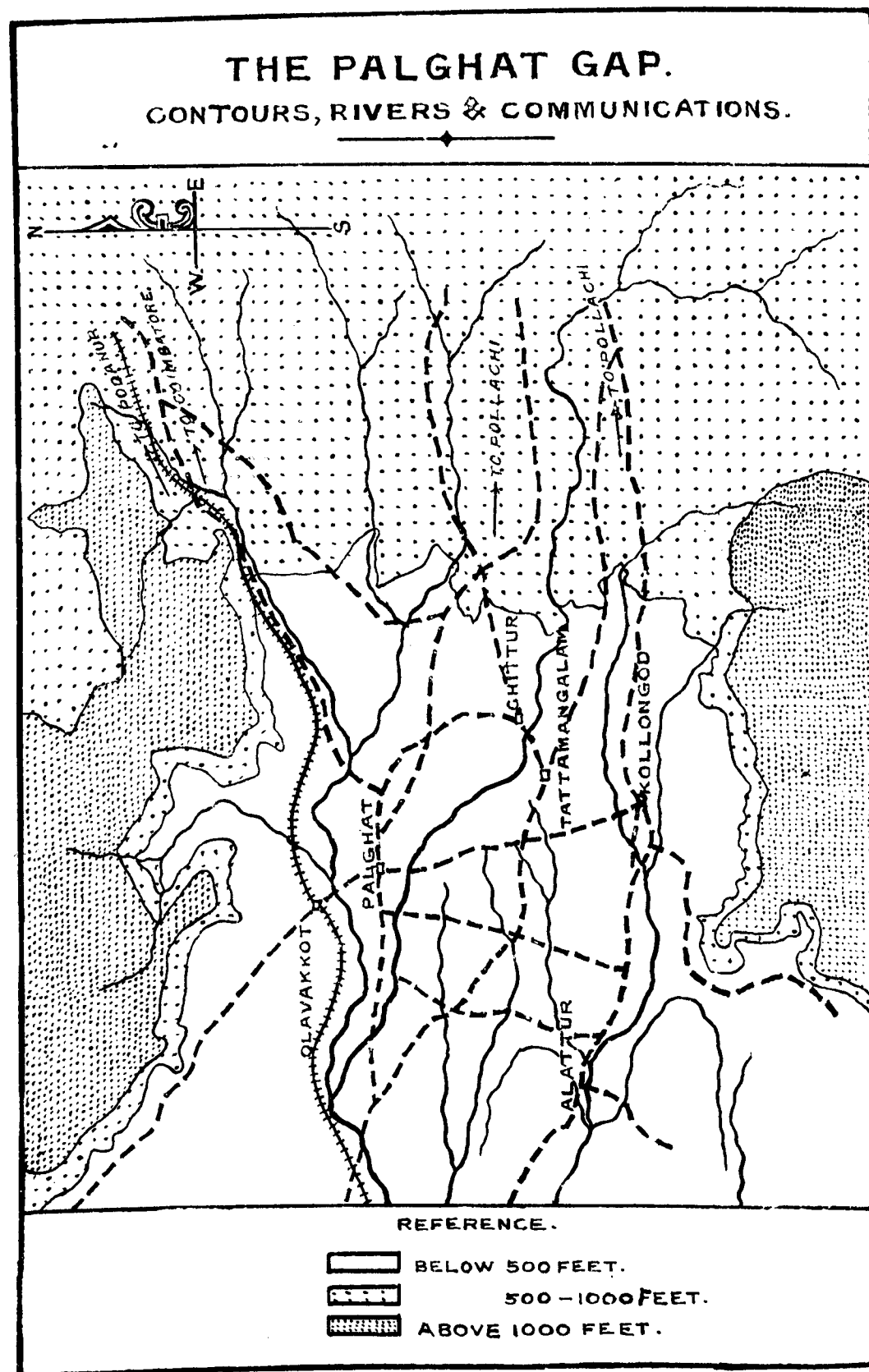


FIG. 3. 4



followed by the present river Cauvery between Salem and Erode following a N. E. to S. W. direction.

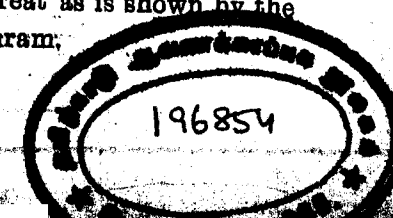
(6) Major oscillations of the plateau and the great Cenomanian Transgression. If the present land were submerged up to a depth of 500 ft. or the sea were to rise to a height of 500 ft. the sea will be washing the foot of the Western Ghats and the Palghat gap will be an estuary, and the Sheveroys and other hills will be islands in a bay. Marine erosion will be carving out features during this period.

(7) Retreat of the sea followed by minor oscillations of elevation and depression at different parts of the plateau leaving us the present features to think about.

The influence of the gap on the meteorology of the plain east and west of it is very great. It has rendered the area just opposite to it on the east cooler by allowing the monsoon winds to pass through without any great obstruction. It is of great importance to communication between the western and eastern sides of the Ghats. The area around the gap is very fertile and the communication is facilitated by the gap to a great extent. There are numerous human settlements on the banks of the river traversing the pass. Railways and roads have converged at the pass from both sides and diverge on both sides of it and the importance of the town of Palghat as a cantonment in former days proves the strategic value of the pass from a military point of view. The development of the Cochin harbour is bound to enhance the value of the gap; and the construction of new railway lines, connecting those already in it, shows signs of its future importance.

The gap acts as a meteorological safety-valve in allowing the monsoon clouds to pass from west to east bringing rains to the parts in the immediate neighbourhood on the eastern side of the Ghats thereby removing any possible rain-shadow effects of the high mountains. It serves as an outlet to the furious storms from the east which sweep the Bay of Bengal. These storms after traversing the peninsula burst forth through the gap to the Arabian sea. The action of the wind is very great as is shown by the accumulation of sand dunes near Dharapuram.

U g m 211, N 26 M 4
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The five hundred foot contour of this gap marks the original shoreline of the sea during the recent geological past. The rains, the wind, the waves of the sea and the torrential rivers with abundant debris from the steep hill-slopes have carved out a tremendous gap fifteen miles wide in a rift in the hard unbroken wall of the western ghats and it stands to-day as one of the marvellous feats of the denuding forces at work on the face of the earth.

The Meteorology of Malabar

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The district of Malabar is situated between the latitudes $10^{\circ} 15'$ and $12^{\circ} 15'$ and longitudes 75° and 77° covering an area of about 5,800 sq. miles. On the western side it has a sea-board about 140 miles in length and on the east is bounded by the Western Ghats which rise in places to a height of 8,000 ft. These high mountains protect Malabar from the intense dry hot winds blowing from the Deccan and also give extensive rainfall during the monsoon months as a result of which vegetation thrives there luxuriantly.

The whole area of Malabar is not at the same elevation, but varies anything between sea-level and 8,000 ft. at the peak on the Ghats. With such varying elevation one cannot expect a uniform climate throughout the country. For a detailed study of the climate of the country a net-work of meteorological stations is necessary; but the interior of Malabar has not been provided with enough meteorological stations. A general idea of climate may, however, be obtained from the data collected at the four meteorological stations on the sea-board, namely Trivandrum, Cochin, Calicut and Mangalore.

General.

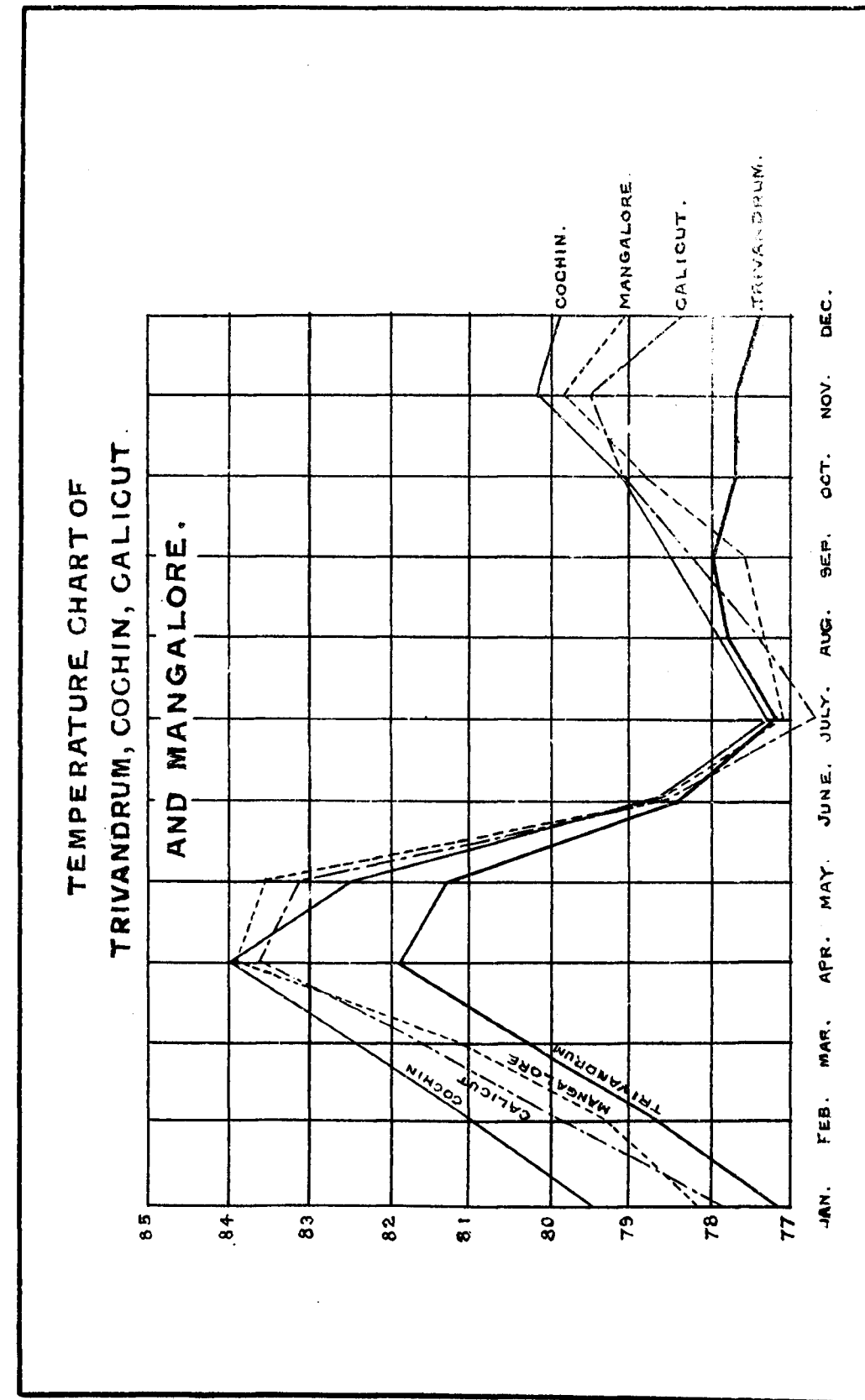
The climate of Malabar is remarkable for the orderliness of its seasons. The year begins with eastern or north-eastern land winds blowing with low velocity. The months January, February and March are comparatively dry months with relatively low mean temperatures. The months of April and May are hot and though the temperature compares favourably with the high temperatures of some of the northern and eastern districts yet the weather is oppressive owing to the dampness of the air. In these hot months, the surface temperature is high and the air in contact with the ground becoming warmer rises aloft and what are known as "convection currents" are set up. Moist air being relatively lighter than cold dry air shows a tendency to over-run the cold air. The winds blowing from north and north-west are damp and owing to the convection currents set up by the ground

temperature the damp winds are raised higher than they would do naturally and the rapid vertical convection of the humid air creates conditions favourable for the generation of thunderstorms. Not only the high temperature but also the situation of the high hills help the vertical rising of the humid air. A large number of thunderstorms thus occur during the months of April and May and are often of considerable intensity. For instance, *Nature* dated 20th September, 1930 under "Historic Natural Events" refers to an extraordinary thunderstorm which occurred in Wynad at 1-45 p.m. on September 27, 1912, unaccompanied by wind but with a good deal of thunder and lightning. The storm is said to have lasted an hour during which time the fall amounted to 9.75 inches. The months of June, July and August are commonly known as monsoon months when the winds blow from west or south-west with increased velocity and occasional squalls and about 70% of the annual rainfall occurs during these months. In September the rains gradually slacken and almost cease in October. This period like April and May gives rise to thunderstorms with rain though not so severe as in the earlier period. The north-east monsoon which gives extensive rain to the Coromandel Coast may also give a few showers in November and the dry season is definitely established in December.

Temperature.

We will now consider in detail the different meteorological elements that contribute to the climatic study of a country. Of all such elements "temperature" is the most familiar and everybody is conscious of it. The mean annual temperature of Malabar is about 80° and in no month does the mean monthly temperature vary from the annual mean by more than 4° . The mean maximum and minimum temperatures for the year are 86° and 75° respectively; and the highest mean monthly maximum of about 90° occurs in April and the mean lowest temperature of 70° in January. The annual range of temperature is 12° and the highest range occurs in the month of January and the lowest occurs in the monsoon months (detailed figures are given in appendix). We thus see that Malabar is free from the extreme temperatures that are felt in the Deccan and has a uniform temperature throughout the year. The highest maximum temperature

FIG. 6.



recorded during recent years (1903 to 1927) was 98.8° in Cochin on 27th February 1920 and the lowest minimum was 63° at the same station on the 7th December, 1922 (compare the highest maximum and the lowest minimum of 111.0° and 50.6° respectively at Bellary).

The curves showing the march of temperature during the year reveals some interesting facts. The year commences with low temperature, the characteristic of dry cold season, which steadily rises till the high temperatures are reached in April. Then the fall commences and in the monsoon months sometimes the lowest temperature of the year occurs, though ordinarily the lowest temperatures are expected to occur in January. After the monsoon months there is a recovery of temperature by 2° to 3° up to November and again there is a fall till January when the upward march commences once again.

Pressure.

We are probably less conscious of atmospheric pressure and its changes than any other meteorological element. It is the difference in pressure from place to place which determines the flow of winds. Just as water flows from a higher level to a lower level, similarly we can say roughly that the wind blows from a region of high pressure to one of low pressure. In short, the general circulation of winds over a region is in a large measure controlled by the distribution of pressure in and around that region and as such it is of very great importance to the Meteorologist in his forecasting work to have a detailed knowledge of the values of pressure from day to day. The values of 8 a.m. pressures corrected to 32° F. and reduced to sea-level and gravity for the Lat. of 45° are available for the four meteorological stations under consideration. The monthly means have been derived from the values by applying the hour corrections. Table I which gives the monthly pressures of the four stations is worth studying. The highest pressure occurs at all stations in the month of January and the lowest in June. In January the pressure progressively increases from Trivandrum to Mangalore and the difference in pressure between Trivandrum and Mangalore steadily decreases through the months of February, March and April. In May the pressure is more or less the same in all four stations. In June when the lowest pressure

of the year is recorded Trivandrum indicates a higher pressure than Mangalore. This reversal in pressure distribution continues for two months and after the monsoon months the pressure at Mangalore rapidly increases while that at Trivandrum does so less rapidly till the highest pressures are again recorded in January. The annual range of pressure is highest in Mangalore having a value of 0.14" and least in Trivandrum with 0.09".

Prevailing Winds.

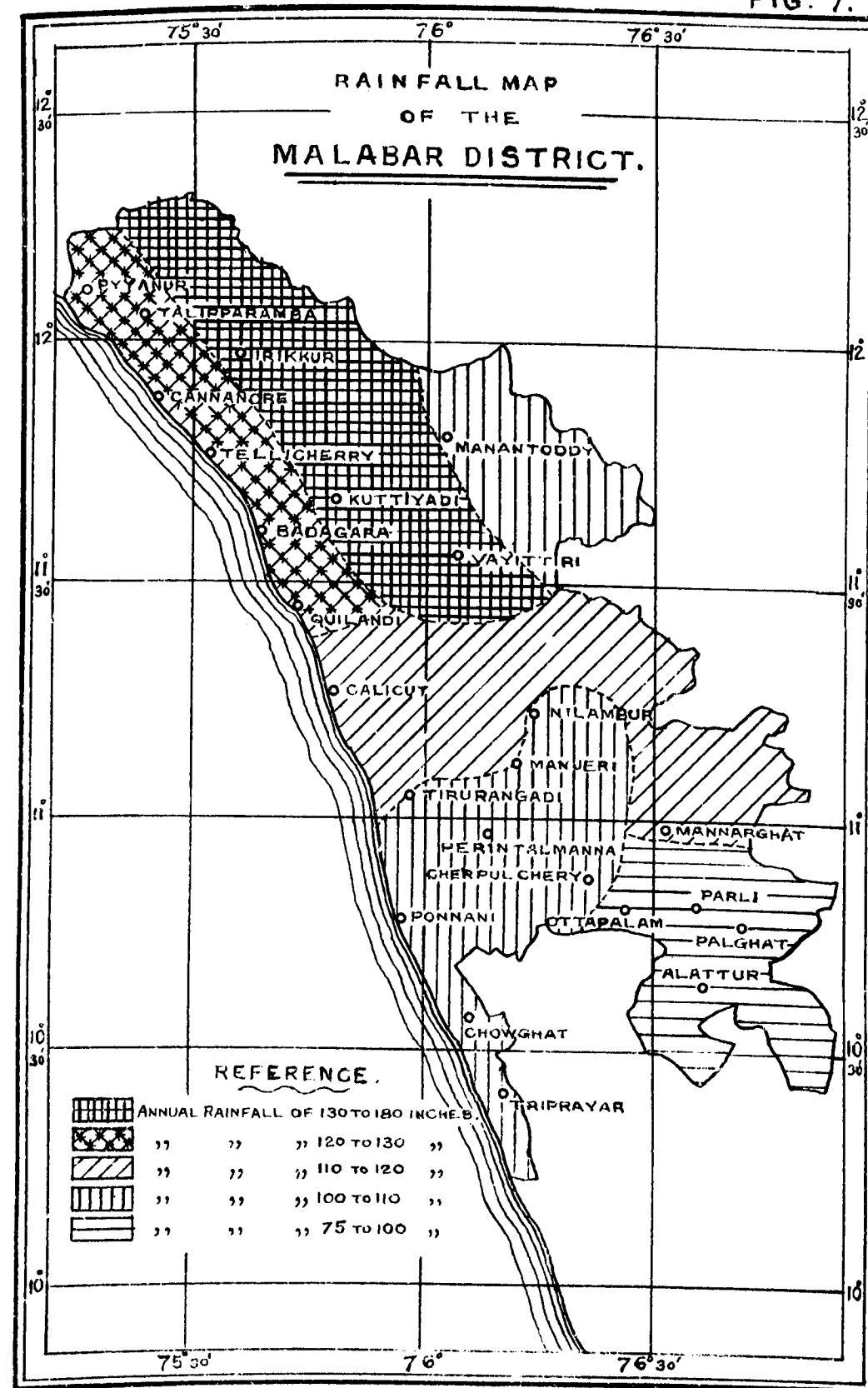
The year begins with east or north-eastern winds with low velocity which steadily backs to north or even north-west in May. In the month of June when the south-west monsoon is vigorous the winds blow from west or west-north-west. Though south-west monsoon should give south-west winds we actually find the winds having some northern components because of the fact that the south-west winds strike against the Ghats which offer resistance to their free passage and turn round to blow through the Palghat gap which is the only passage in the Ghats connecting the east and west coast of the Peninsula. Thus the winds appear to be blowing with some northerly component. After the monsoon months the winds steadily run through north to north-east in the dry cold months with a progressive decrease in velocity.

We thus see that the winds blow from north and north-east when the pressure is highest in Mangalore and lowest in Trivandrum. As the year advances and the low pressure region travels northwards and the high pressure region travels southwards the winds gradually back through north to north-west and to the west till at last the south-west monsoon is established when the low pressure is formed at Mangalore and high pressure is at Trivandrum. This flow of winds is exactly what one would expect with the variation of the pressure distribution as explained above.

Humidity.

The humidity is high; and in no part of the year is it lower than 60%. The annual value varies between 70% and 80% the maximum humidity being in the monsoon months and the minimum in the month of January. The values examined are taken from the sea-coast stations only and are hence not representative of Malabar as a whole. Towards the interior and on Ghats the air is no doubt less humid; but the figures are not available.

FIG. 7.



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Cloud

The amount of cloud varies from month to month and for the year is between 50 and 60 per cent. of the total visible sky. The cloud amount is naturally highest in the monsoon months and least in January, the driest month of the year.

Rainfall.

While we may assume more or less uniform temperature throughout Malabar, we find varying falls of rain during the year in different localities according to their situation. Places situated on and near the Ghats record higher falls of rain than those situated away from the Ghats. There are 25 rain-recording stations in the district of which we find Palghat recording the lowest annual fall of 78 inches, while Kuttayadi, a station in Wynad records a fall of 173 inches. The average annual rainfall for the whole of Malabar is about 118 inches on 118 rainy days giving an average fall of 1" per every rainy day. Heavy falls of rain of more than 10 inches are fairly frequent and floods are quite common. Meteorological records show that within 24 hours a fall of 16.5" was recorded on June 3rd 1924 at Kuttayadi and 14.05" on July 7th 1926 at Vayittiri. Vayittiri recorded a fall of 74 inches from 15th to 24th of July, 1924 and Manantoddy 73.4" from 16th to 20th of July of the same year. During recent years 1924 floods did extensive damage to life and property in Malabar. Such floods are not infrequent in the district.

A statistical study of rainfall figures shows that places having scanty annual rainfall are subject to great variations while places having heavy annual falls are not subject to such variations. In India the greatest variability of rainfall occurs in Rajputana where the annual rainfall is not more than 10 inches. The least variability occurs in the Malabar Coast and Assam valley where annual falls are high. In spite of the stated low variability of annual rainfall in Malabar the economic distress to the agriculturists who depend mainly on rainfall is really great if the rainfall is either deficient or in excess over the normal resulting in floods or if the fall is not well-distributed throughout the year.

Storms

Unlike the Coromandel Coast the Malabar Coast is comparatively free from the devastations of storms and cyclones. The

author of Malabar District Gazetteer refers to a storm which occurred in 1848 causing great loss of life and property. Usually the Arabian sea storms travel westwards or north-westwards and rarely travel eastwards and cross the Malabar Coast. However, such storms in their course northwards may give extensive rain to the Malabar Coast. There are instances when the storms that originate in the Bay of Bengal cross the Coromandel Coast travel across the Peninsula and emerge to the Arabian Sea across the West Coast. Even in such cases heavy rainfall occurs on the Malabar coast though the fury of the winds might have abated. In the records there is no instance of a storm originating in the Arabian Sea and jumping off to the Bay of Bengal after crossing the Peninsula.

The mean monthly pressure corrected for temperature and reduced to sea level and standard gravity at 45° Latitude.

TABLE I

Months	Trivandrum	Cochin.	Calicut.	Mangalore.	Mean of all the Four Stations.
January	29.868	29.877	29.878	29.901	29.881
February	862	863	865	886	869
March	834	836	837	857	841
April	796	794	790	807	797
May	783	783	773	787	781
June	781	792	773	764	778
July	798	808	794	783	796
August	808	827	808	818	815
September	818	829	815	825	822
October	828	829	819	832	827
November	838	839	834	851	841
December	861	862	864	883	867
Annual	824	828	824	841	829

TEMPERATURE—TABLE II

Months.	Trivandrum.				Cochin.				Calicut.				Mangalore.				Mean of four stations.			
	Mean.	Max.	Min.	Range.	Mean.	Max.	Min.	Range.	Mean.	Max.	Min.	Range.	Mean.	Max.	Min.	Range.	Mean.	Max.	Min.	Range.
January	77.1	83.4	72.4	11.0	79.5	89.1	71.5	17.6	77.8	87.6	69.6	18.0	78.2	88.5	69.5	19.0	78.1	87.2	70.8	16.4
February	78.6	85.0	74.0	11.0	80.9	89.9	73.7	16.2	79.8	88.7	72.6	16.1	79.3	88.1	72.3	15.8	79.7	87.9	73.2	14.7
March	80.3	87.1	76.7	10.4	82.5	91.2	77.0	14.2	81.6	90.3	76.1	14.2	81.1	89.4	76.0	13.4	81.9	89.5	76.5	13.0
April	81.9	87.5	78.3	9.2	84.0	91.5	78.4	13.1	83.6	91.3	77.9	13.4	83.9	91.1	78.7	12.4	83.3	90.1	78.3	11.8
May	81.3	86.3	78.5	7.8	82.5	89.6	77.6	12.0	83.1	90.4	77.9	12.5	83.5	90.3	78.8	11.5	82.6	89.2	78.2	11.0
June	78.4	82.9	76.2	6.7	78.7	85.0	74.7	10.3	78.5	84.6	74.7	9.9	78.8	85.0	75.0	11.0	78.6	84.4	75.2	9.2
July	77.2	82.1	75.2	6.9	77.3	83.5	74.1	9.4	76.7	82.5	73.9	8.6	77.1	83.0	74.2	8.8	77.1	82.8	74.4	8.4
August	77.8	82.3	75.4	6.9	77.9	83.7	74.3	9.4	77.4	82.8	74.1	8.7	77.3	82.8	74.0	8.8	77.6	82.9	74.7	8.2
September	78.0	82.9	75.3	7.6	78.5	84.6	74.5	10.1	78.3	84.3	74.4	9.9	77.6	83.3	74.1	9.2	78.1	83.8	74.6	9.2
October	77.7	82.7	75.2	7.5	79.1	86.2	74.6	11.6	79.1	86.2	74.5	11.7	78.9	85.7	74.6	11.1	78.7	85.2	74.7	10.5
November	77.7	82.6	74.4	8.2	80.2	87.5	74.4	13.1	79.5	87.4	74.4	14.3	79.8	86.3	73.1	15.2	79.1	86.5	74.1	12.4
December	77.4	83.0	73.4	9.6	79.9	88.5	72.9	15.6	78.3	87.6	70.5	17.1	79.0	89.5	70.0	19.5	78.7	87.2	71.7	15.5
Annual	78.6	84.0	75.4	8.6	80.1	87.5	74.8	12.7	79.5	87.0	74.1	12.9	79.6	87.1	71.7	15.4	79.5	86.4	74.6	11.8

Average monthly rainfall of a few stations in Malabar and West Coast—TABLE III

Name of Place.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Trivandrum	0.74	0.61	1.50	4.51	8.44	13.89	7.40	4.06	4.14	10.53	6.60	2.43	64.40
Cochin	0.78	0.90	1.96	5.00	11.65	29.11	22.35	12.25	9.28	13.22	6.24	1.69	114.43
Calicut	0.34	0.19	0.55	3.19	9.52	34.98	29.85	15.29	8.38	10.31	4.90	1.06	118.55
Mangalore	0.13	0.09	0.07	1.42	6.42	37.72	38.00	23.20	11.10	7.76	2.77	0.46	129.14
Palghat	0.25	0.36	0.90	2.71	4.96	17.04	21.21	11.76	6.08	8.28	3.95	0.91	78.44
Manjeri	0.18	0.19	0.60	3.11	6.69	29.55	29.23	14.68	7.10	11.97	6.04	0.93	110.27
Quilaudi	0.23	0.15	0.32	2.90	8.35	37.50	34.70	18.17	8.25	9.33	4.70	0.96	125.56
Irakkur	0.17	0.21	0.32	1.58	8.74	39.42	45.78	25.03	9.88	11.90	5.97	1.13	150.13
Kuttiyadi	0.61	0.34	0.55	3.54	11.73	41.47	48.41	26.41	12.05	14.97	10.26	2.58	173.92

Types of Forest Flora in Malabar

By G. Viswanathan, B.A.

Curator, Gass Forest College Museum, Coimbatore

For a study of the rich and varied flora of the forests of this fascinating district it is useful to know a bit of its geography.

“Lying between 10°. 15' and 12°. 19' north latitude, and between 75°. 14' and 76°. 52' east longitude, it is bounded on the north by South Kanara, on the east by Coorg, Mysore, the Nilgiris and Coimbatore, on the south by the native state of Cochin, and on the west by the Arabian Sea, the total area being about 5,700 square miles. The mountains of the Western Ghats varying from 3,000 to 5,000 ft. above sea-level on the Coorg and Wynaad slopes, and reaching 7,000 ft. and even higher on the Kunda face, run almost parallel to the coast. (The portion of the range eastward from the Kundas as far as the lofty mountains north of Palghat is comparatively low; it encloses a tract of 200 sq. miles known as the Attapadi valley where rise the headwaters of the Bhawani).” “The great backbone of the Indian peninsula” the Western Ghats, which is about a thousand miles long, rising steeply at a distance of about 50 miles from the (west) coast presents a very striking feature in this district: The long and gigantic chain is completely broken some 25 miles asunder, forming here the “Palghat gap,” a singular passage through which the moisture-laden south-west monsoon is allowed to pass and give welcome showers to the parched-up country immediately east of it. The gap separates the mountains of Travancore from those to the north of them, and the flora of this region is carried some distance across the peninsula at this point. The Western Ghats catch almost the whole rainfall of the south-west monsoon giving the district a rain of about 100 inches in the plains, and more than 150 inches in the hills. The district is thus a very moist one so moist that during the rainy months even the exterior of walls and tiles of the roofs of houses becoome green!

“Malabar is singularly diversified in its configuration. The great range of the Western Ghats looks down from the east on a

country broken by long spurs, extensive ravines, dense forests and tangled jungles. Stretching westward, gentler slopes, rolling downs, and gradually widening valleys closely cultivated succeed the forest-clad uplands. Nearer the sea-board the low laterite table-lands shelve into rice plains and backwaters fringed with cocoanut palms."

There are three forest divisions each under a District (Divisional) Forest Officer: Palghat, Nilambur, and Wynaad. I do not propose to describe these forests separately but shall classify the growth in them according to the types of forests occurring. The forests in question fall under four broad types:

- I. The mixed deciduous or monsoon forests.
- II. The tropical evergreen or rain forests.
- III. The sub-tropical or temperate evergreen forests.
- IV. Mangrove and littoral forests.

I. **The mixed deciduous or monsoon forests** are found in regions below about 3000 ft., and where the rainfall¹ exceeds about 70 in., and are unlike the evergreen forests, being composed chiefly of deciduous trees—trees which are more or less leafless for the greater part of the dry hot season, from about January to May or June. (This type is well illustrated in the Wynaad plateau). The growth is not so dense as in the evergreen type, nor are the trees so lofty. There is an abundance of woody climbers and herbaceous epiphytes, but woody epiphytes are rare. These forests merge on the one hand into the evergreen type, and on the other into the drier types of mixed deciduous forest (of the Deccan).

This mixed type is of great economic importance as it contains a large number of valuable species of trees, chief among which are detailed in appendix I.

¹ "The typical monsoon forest of Schimper's definition comprises the moister and more luxuriant forms of mixed deciduous forests which are well developed in the West Coast region, in the moister parts of the sub-Himalayan tract, and in Assam, Chittagong, Burma and the Andamans.

In the Indian region, however, monsoon forest answering the description in every respect occurs in regions with a rainfall of not more than 50 in., and perhaps as low as 40 in.; such forest is well-developed in parts of Orissa, the Central Provinces, the Circars and other localities."
—Troup.

II. **The tropical evergreen or rain forests** are found in regions above about 3000 ft. and where the rainfall is more than 80 in. They are characterised by rank luxuriance of growth, and composed of three or more storeys. The lowest consists of dense shrubby evergreen under-growth. The intermediate tiers are formed by evergreen trees struggling hard for light. The top-most storey is made of gigantic trees, often with huge buttresses, and reaching a height of 150 ft. or more. The branches are sometimes given off at such a height from the ground that one has either to shoot at twigs to obtain specimens of them, or resort to the hillman's harmful practice of driving a series of pegs right up to the first branch to serve as a ladder. The species are very numerous; gregariousness is strikingly absent. Many of the trees have a rather thin smooth bark and are only sparingly branched. The leaves are of very diverse forms, often coriaceous and glossy, seldom finely pinnate. There is an abundance of thick-stemmed climbers and climbing palms and epiphytes (herbaceous as well as woody.)

This type is characteristic more of the southern (Palghat and Nilambur forest) than the northern forests of Malabar. It is well represented in the forests of Western Ghats generally. The chief trees of this type are given in appendix II.

III. **Sub tropical or temperate evergreen forests.**—Still higher up, commencing at about 5000 ft. and up to about 6000 ft. trees are much shorter than those of the evergreen type below and the forests are of the temperate evergreen type and known generally as **sholas**, which are a characteristic feature of the landscape elsewhere, as in the Nilgiris, Anamalais, Palnis, etc. A glimpse of this type can be had in this district, only on the ghat forests of the Nilambur valley.

The chief trees of this zone are given in appendix III.

Above 6000 ft. the growth is characteristically stunted, the most common species being *Rhododendron nilagiricum* Zenk. (Mal. Kattu-puvarasu)—with very coriaceous leaves clustered at ends of branchlets and dark crimson flowers with large silky bracts—and species of *Eugenia*.

The zones of *altitude* mentioned above, as marking the boundaries of the different forest types, must not be regarded as clear-cut and well-defined ones. For instance, the forests on the

Ghats of the Nilambur valley above 3000 ft. are entirely evergreen. On the north-western and northern aspects the evergreen type is generally met with at 2500 ft., and on north-eastern aspects even down to 1500 ft. Again, lower down, along the river banks there are very narrow belts of forest composed mostly of evergreen species. A similar variation is also noticeable with regard to the degree of rainfall as a factor determining the type of forest, for instance the regions of widely differing amounts of rainfall affected by monsoon forests in India. (See foot note on page 112.)

IV. Mangrove and littoral forests.—To the above mentioned broad types of forest growth may be added those of a more local character, such as (1) mangrove forests along tidal creeks, estuaries of rivers, backwaters, etc., so characteristic especially of the Malabar coast and (2) littoral forests. These types are good examples of plant-formations caused by edaphic factors (that is, factors connected with the soil as apart from the climate). The species are 'halophytic' owing to the saline nature of the soil. Though the habitat is very wet it is physiologically dry, the plant trying to minimise transpiration to avoid an excess of salt in which the water abounds. The leaves therefore exhibit a xerophytic structure (i.e., adaptations for the drought conditions.)

(1) **Mangrove forests.**—The component species of this type of forest show special adaptations for anchorage, aeration, regeneration, etc.; stilt roots and aerial roots descending from the branches anchor the trees in the soft mud, resisting the force of the wind and the tides. Superficial roots sometimes ribbon-shaped (ribbon-roots) spreading along the surface of the ground, or bending out of the mud in the form of knees (knee-roots) and erect pneumatophores (breathing roots) supply the roots with oxygen. The most ingenious of the devices exhibited is the 'vivipary,' the seed commencing to germinate while on the parent plant sending down a long hypocotyl (up to 2½'), and the seedling planting and establishing itself in the mud in due course.

1. Vivipary much less pronounced is also noticeable in certain non-mangrove species, such as, *Sal. Hopcia parviflora*, *Artocarpus integrifolia*. In these cases the germination of the seed while on the parent-tree is very rare, but the seeds quickly lose vitality and have to be sown as soon as possible.

The chief species of the mangrove swamps are :

- (1) **Rhizophora mucronata**, Lam.
with both stilt and aerial roots, elliptic-mucronate fleshy leaves and seeds sending long hypocotyls (2 ft. or more).
- (2) **Ceriops Candolleana**, Arn.
(with aerial roots but without stilt roots. and hypocotyl 4-10 in. long,
- (3) **Brugiera gymnorhiza**, Lam.
without stilt roots but with abundant knee-roots—the largest of the mangroves.
- (4) **Sonneratia caseolaris**, Engl. (= *S. acida*, L.)
with Asparagus-like pneumatophores (which are used as a cork substitute), obovate dull green leaves, showy dark purple flowers
- (5) **Avicennia officinalis**, L.—White-mangrove.
with densely silvery-tomentose leaves and numerous pneumatophores.
- (6) **Excoecaria Agallocha**, L.—Blinding Tree.
with a poisonous acrid milky juice, grey lenticellate bark, minute yellowish fragrant flowers and very soft white wood (useful for matches.)
- (7) **Lumnitzera racemosa**, Willd.
- (8) **Carapa obovata**, Bl.
- (9) **Aegiceras majus**, Gaertn.

(2) **Littoral forests** are found usually on raised sandy and stony beaches above the reach of high tide. These also exhibit xerophytic leaf structures. Eg. *thick leathery leaves* of (i) *Calophyllum inophyllum*, L. (Alexandrian laurel: *Mal.*: Puna) with shining decussate leaves and white flowers.—often also planted for the sake of the lamp oil from the seeds. (ii) *Terminalia catappa*, L. (The Indian almond. *Mal.* Adamarram) (with whorled branches, and leaves turning bright red before falling): (iii) Young shoots with a viscid resinous coat: as in *Dodonaea viscosa*, L. *Mal.* Vrali)—with oblanceolate leaves and membranous capsules 2-3 winged. (iv) leaves much reduced and scale like as in *Casuarina equisetifolia*, Forst. (The casuarina or beef-wood tree)—the well-known conifer-like tree extensively planted on sandy coasts for fuel.

Malabar is known as 'the land of plenty.' This is because of the rich vegetation not merely of the forests but of the plains. Almost every house has its own spacious garden with a number of trees, shrubs and climbers of economic value; chief among the cultivated species are teak, jack, cashewnut, cocoanut, areca, corypha umbrauculifera, varieties of plantain, mango, *Dioscorea*

Spp. (yams)—, climbers with large tuberous roots which are generally acrid, the acidity being removed by cooking, *Amorphophalus campanulatus* (Tamil: Senai-kilangu), Pepper, ginger, cardamoms, *Manihot utilissima* (the Tapioca).

The almost total absence of prickly pear in this district is noteworthy. The district is unique in having a very large variety of medicinal herbs in the plains and in the forests. The number of medicinal plants (whether herbs, shrubs, climbers or trees) known and used by the people of this district is remarkably great. Even the forest department realises some revenue from medicinal plants here and there. Last month I learnt from the District Forest Officer, Palghat that a few hundreds of rupees were realised from the auction of the Cucurbitaceous climber 'Pei-podal' (*Trichosanthes cucumerina*, L.*.) from Walayar forests.

The flora of Malabar is not unlike that of Travancore but the number of endemic species is rather small when compared to Travancore where a fairly large number of species occur which are peculiar to that state and to Tinnevely. (The appendices to this paper will show the species which are abundant in the district. Only trees are included in the lists.)

I am indebted to Mr. J. C. Wrench, I.F.S., Principal, Forest College, for permitting me to read this paper, and for valuable suggestions made.

*"A slender annual climber with rather shortly laciniate small white flowers, deeply 5-lobed leaves and an ovoid fusiform fruit, green and striped when fresh, scarlet or orange when ripe up to 3 in. long.—Deccan and West coast, in plains country and in lower hills"—Gamble.

APPENDIX I.

Abbreviations used:

Tam. = Tamil name.

Tel. = Telugu „

Mal. = Malayalam „

Kan. = Kanarese „

Mixed deciduous or monsoon forests:

The chief trees of this type of forest are:—

- (1) **Tectona grandis**, L¹. (Teak). Tam., Tel. and Mal. Thekku. Kan. Jadi.

1. This, the monarch of timbers, is also to be found in the famous and most valuable Plantations in the Nilambur valley.

with quadrangular channelled branchlets, large decussate leaves and erect terminal panicles.

- (2) **Dalbergia latifolia**, Roxb. (Rosewood.) Tam. Itti; Tel. Jitegi; Kan. Beti; Mal. Karu-vetti.

with odd-pinnate leaves, whitish flowers in corymbose panicles fasciated on old wood, and narrow thin lanceolate pods.

- (3) **Terminalia tomentosa**, W. and A.² and **T. crenulata**, Roth. (The Indian Laurel.) Tam. and Mal. Karu-marudu; Tel. Nallamaddi; Kan. Matti.

with greyish black, deeply-fissured thick bark and large 5-winged fruits.

- (4) **Pterocarpus Marsupium**, Roxb. (The kino-tree.) Tam. and Mal. Vengai; Tel. Yegi; Kan. Honne.

with bark exuding a red juice, 5—7 coriaceous leaflets, terminal panicles of orange sweet-scented flowers and round flat thin winged fruits.

- (5) **Xylia xylocarpa**, Roxb. Tam. Irul; Tel. Konda-tangedu; Mal. Irumulla; Kan. Jambe.

with leaves bipinnate with only one pair of pinnae, glandular rachis, cream-coloured flowers in globose heads and large woody flat falcate-oblong brown pods.

- (6) **Grewia tiliaefolia**, Bedd. (**G. letopetala**, sp. nov.) Tam. Thadasal; Tel. Charachi; Mal. Chadicha; Kan. Tadasala.

with variable leaves—broadly cordate to obliquely ovate, serrate, stipules linear to foliaceous and broadly falcate, flowers in fascicles of 2—6 (petals without a claw), and 2-lobed fruits of the size of a pea.

- (7) **Lagerstroemia lanceolata**, Wall. (Ventek.) Tam., Tel. and Mal. Ventekku; Kan. Billi-nadi

with white bark exfoliating in large papery strips, leaves bluish-white beneath, (especially when dry), and small 4 valved capsules with many winged seeds

- (8) **Adina cordifolia**, Hook. f. Tam. and Mal. Manjakkadambu; Tel. Bandaru; Kan. Ahnau.

with orbicular-cordate leaves, stipules concealing the upper-most pair of leaf-buds, flowers in small heads, and seeds very minute.

1. *D. sissooides*, Grah. (Mal. Vel veeti) with obovate acute leaflets and loose terminal panicles is also common in moister (?) areas.

2. "Figured" logs of 'karumarudu' are supposed to characterise the species *T. crenulata*, Roth, for which there is a great demand in the western markets. This species is practically confined to the W. Ghats and is common enough in the Malabar forests.

- (9) **Terminalia paniculata**, Roth. *Tam. and Mal.* Pillamarudu; *Tel.* Neomeeri; *Kan.* Honal.
with small flowers in large spreading panicles and fruits with 3 wings two of which are much smaller than the third.
- (10) **Terminalia belerica**, Roxb. (The beleric myrabolan.) *Tam., Tel. and Mal.* Thani; *Kan.* Santi.
with greyish-green leaves on very long petioles clustered at ends of branchlets, and obscurely 5-angled fruits.
The chief bamboos are:
- (11) **Bambusa arundinacea**, Willd. (Thorny bamboo.) *Tam.* Mungil; *Tel.* Mundla-veduru; *Mal.* Illi; *Kan.* Bidru.
with big hollow culms, branchlets with short sharp spines, and flowers in panicles.
- (12) **Dendrocalamus strictus**, Nees. (Male bamboo.) *Tam. and Mal.* Kal-mungil; *Tel.* Sadanapu-vedru; *Kan.* Kiri-bidru.
with culms unarmed and nearly solid, (i.e., with very thick walls and flowers in dense globose heads.
- (13) **Ochlandra Rheedii**, Benth. *Mal.* Ammoi.
(also *O. travancorica*, Benth.) Elephant grass. *Tam.* Eerak-khazhi; *Mal.* Etta.
(shrubby reed-like gregarious bamboos with culms very thin-walled and leaves fairly large. Fruits large, long-beaked and fleshy.)
- (14) **Oxytenanthera monostigma**, Bedd. *Kan.* Choua; *Mar.* Huda.
(culms velvety tomentose and yellowish when young and grey when old; internodes and culmsheaths 15—18 in. Flowers in spicate heads.)
In the drier types of mixed deciduous forests the following are common:
- (15) **Anogeissus latifolia**, Wall. (Axle-wood.) *Tam.* Vel-nagei; *Tel.* Chiriman; *Mal.* Maru-kanchiram; *Kan.* Dindal
with very thin grey-white bark, copper-coloured young foliage, flowers in globose heads, and fruits small, yellowish-brown, nearly round, flat, and packed in dense heads.
- (16) **Albizzia**, spp. *Tam.* Vagai.
unarmed trees with evenly bipinnate leaves, globose heads of flowers and large flat straight pods.
- (17) **Bridelia retusa**. *Tam.* Mullu-vengai; *Tel.* Kora maldi; *Mal.* Mukkayini; *Kan.* Asana.
- (18) **Kydiacalycina**. *Tel.* Potri; *Kan.* Bendi.
with 2-valved capsules borne on connate accrescent bracteoles, hanging on the tree for months.

- (19) **Acacia**. (*Tam.* Velamaram.)
usually armed with stipular or scattered spines; bipinnate leaves with small leaflets, and flowers in heads or spikes.
- (20) **Bombax malabaricum**, Dc. (The red silk-cotton tree.) *Tam.* Mulilavam; *Tel.* Buraga; *Mal.* Poola; *Kan.* Burla.
with digitately compound leaves and large scarlet flowers.

APPENDIX II.

Tropical evergreen or rain forests.

NOTE:—Species marked with an asterisk are fairly abundant in the evergreen forests of the Palghat Division.

The chief trees of this type of forest are:

- (1) ***Calophyllum tomentosum**, T. Anders. (The poonspar.) *Tam.* Kattu-pinnai; *Mal.* Chambagam; *Kan.* Surhoni.
with shining dark-green coriaceous leaves and deeply cracked bark.
- (2) ***Palaquium ellipticum**, Engl. = *Diospyros elliptica*, Benth.
Tam. Palai-palvadinthan; *Mal.* Pali or Pala; *Kan.* Panchonta.
with copious milky juice and elliptic glabrous leaves.
- (3) ***Mesua ferrea**, Linn. (Iron wood.) *Tam.* Suruli, Vainavu, Nangal; *Tel.* Naga-Kesara; *Mal.* Nanga; *Kan.* Naga sampige.
with the underside of leaves usually bluish grey and young foliage bright red, and flowers white and fragrant.
- (4) ***Hopea parviflora**, Bedd. (Iron-wood of Malabar.) *Tam.* Kongu Irumbogam; *Mal.* Thambagam; *Kan.* Kiralhogi.
with leaves having glands in nerve axils underneath and fruits with a pair of straw-coloured wings.
- (5) ***Canarium strictum**, Roxb. (Black dammer.) *Tam.* Karunkungiliyam; *Mal.* Thelli; *Kan.* Manda-dhup.
with young foliage like red-velvet and very large compound leaves 1—4 ft. long.
- (6) **Artocarpus hirsuta**, Lam. (Wild jack.) *Tam.* Aini-pila; *Mal.* Ayani; *Kan.* Halasu.
Leaves with long yellow hairs beneath; entire in adult, and often lobed in young trees and coppice shoots.
- (7) **Artocarpus integrifolia**, L. (Jack.) *Tam. and Mal.* Pila; *Tel.* Panasa.
well-known for its huge fruits with yellow edible flakes.

1. In fact, some trace the name "Palghat" to the occurrence in great abundance of various kinds of *Pali* or *Palai* of which *Palaquium* is the most abundant. (*Pali-kadu*—*Pal-ghat*.)

- (8) **Acrocarpus fraxinifolius**, Wt. *Tam.* Mulai-konnai; *Mal.* Malam-konna; *Kan.* Hantige.
with very large bi-pinnate leaves and bright red young foliage.
- (9) **Cullenia excelsa**, Wt. *Tam.* Karanai; *Mal.* Mullu chukka.
with greyish white smooth bark and leaves clothed beneath with silvery or orange coloured peltate scales; the fruits covered with long prickles.
- (10) **Dysoxylum malabaricum**, Bedd. (The white cedar.) *Tam.* and *Mal.* Vella agil.
with grey bark studded with white warts, oblique pale green leaflets and yellow tubercled capsules.
- (11) **Poeciloneuron indicum**, Bedd. *Tam.* Poothankolli; *Mal.* Vayila; *Kan.* Kirballi.
with glossy dark-green lanceolate leaves, nerves close-set and parallel with fine reticulation between them.
- (12) **Vateria indica**, L.¹ (The Piney-varnish or Indian Copal tree; White-dammer.) *Tam.* Dhupa, Vellai-kungiliyam; *Tel.* Dupada. *Mal.* Payin; *Kan.* Gugli.
with large leaves having prominent secondary nerves, lax panicles of white fragrant flowers, and seeds with large fleshy and oily cotyledons.
(A new species of *Vateria*, viz., *V. macrocarpa*, B. L. Gupta, has recently been found in Muthikulam, Palghat Division—probably endemic. *Vide, Indian Forester* p. 232, April 1929).
- (13) **Hydnocarpus wightiana**, Bl. *Tam.* Maravetti, *Mal.* Nirvetti; *Kan.* Thoratti; *Mar.* Kantel.
with crenulate or serrate leaves and large brown woody tubercled fruits.
- (14) **Tetrameles nudiflora**,² R. Br. *Tam.* Chini; *Mal.* Ponthan chini.
A *deciduous* tree with spongy greyish white bark, broadly ovate serrulate leaves and coriander-like fruits (this tree occurs also in *deciduous* forests)
- (15) **Myristica**, spp. (Nut-mega). *Tam.* Jadikai.
- (16) Many of the **Lauraceae**, such as *Cinnamomum* spp. (Cinnamon.) *Tam.* Lavanga.

1. This tree is commonly planted as an *avenue* tree in the West Coast for the sake of the fragrant flowers.

2. Evergreen forests may contain certain *deciduous* species as well

APPENDIX III.

Sub-tropical or temperate evergreen forests :

- (1) **Michelia nilagirica**, Zenk, *Tam.* Kattu-shanbagam, the 'champak' of the hills, differing from that of the plains in having large white flowers instead of the yellow.
- (2) **Eugenia**, spp. (*Tam.* Naval.)
- (3) **Hydnocarpus alpina**, Wt. (*Tam.* Attuchangalai; *Kan.* Sanuasolti.
with large *entire* leaves and very large tomentose fruits (without tubercles).
- (4) **Ilex**, spp. (*Tam.* Vellodai.)
- (5) **Ternstroemia japonica**, L. (*Badaga* Kiamonu).
with *entire* obovate leaves with red petioles.
- (6) **Gordonia obtusa**, Wall. (*Badaga* Nagetta.)
with pale green crenate lanceolate leaves, large white flowers, and brown 5-angled capsules with winged seeds.
- (7) Also species of **Symplocos**, **Meliosma**, **Glochidion** and various **Lauraceae**.

Among Bamboo, *Oxytenanthera Thwaitesii* is common with a sprinkle of *Arundinaria Wightii*, *Teinostachyum Wightii* and *Ochlandra* spp.

Agricultural Geography of the Malabar District

By Mr. V. K. Sourirajan, M.A., L.T.

Scope of the paper—When considering the natural regions of India the two coastal strips are taken together for study as one region. In spite of some seeming resemblances between the strips in contrast to the other major regions of India the eastern and western sea board of India have their essential differences. It is this point of view that is sought to be stressed in this paper.

The Region—The western coast strip from Surat down to Cape Comorin is taken as one natural region comprising the Konkan region of the Bombay Presidency, Portuguese Goa, the districts of South Kanara and Malabar in the Madras Presidency and the states of Cochin and Travancore.

The District—The Malabar district faces the Arabian Sea for a distance of 150 miles and the district is divided into 9 taluks. A look at a coloured relief map of the district shows how there are three distinct features of relief—a very level plain near the sea coast, somewhat elevated lands beyond and the foot hills of the Western Ghats especially in the Wynad Taluq. The most important feature in the relief of this region is the Palghat gap. The strip of land is generally more wide in the north but extends to about 50 miles further south, the extreme breadth of the plain being 80 miles (from Ponani to Valayar.)

A noteworthy feature of relief which affects the human occupation of this area is the presence of a number of small rivers which have hollowed out for themselves long valleys to the coast where backed by the sand brought by the littoral currents they discharge into a line of back-waters. The back-waters, the streams which flow into them and the canals which have been dug form an easy waterway which is absent on the east coast but for the costly and ever declining Buckingham canal.

The Geology—There are several indications to show that originally Malabar lay some 50 feet below sea-level and that the narrow coastal plain which now separates the sea from the western

edge of the Plateau (*viz.*, Western Ghats) has been raised by some internal disturbance in the earth. Popular belief, however, connects this phenomenon with God Parasurama and refers to how he reclaimed the land from the sea. On account of this belief the land is also known as 'Parasurama Kshetram.'

The terraced character of the plateau just above the littoral plain is due to the effect of denudation. The soil of the area is generally a mixture of sand and silt slightly saline so that it is best suited for the cultivation of the cocoanut palm. An extensive soil study of eight of the taluqs of the district was made by Mr. B. V. Nath (issued as bulletin No. 91 of the Madras Agricultural Department.) The three most salient conclusions to which the Agricultural Chemist of the Madras Government has arrived at are (1) that the soils of Malabar generally contain adequate supplies of nitrogen and may not require the use of nitrogenous manures, (2) the whole area is deficient in lime and magnesia and would benefit by using these fertilisers, and (3) the existing practice of manuring with green leaf where it is available and possible is good and the use of this manure requires to be supplemented with concentrated manures.

For purposes of this study the district has been divided into two parts the northern and the southern, owing to certain important differences between them.

Climate—The temperature of the whole district is equable, the average being 80° F. and the mean annual range only 12° F. The lowest temperature on record is 70° F. The percentage of humidity is very great on account of the heavy rainfall and the nearness to the sea. Can this explain the minimum amount of clothing worn by the people?

The entire district is exposed to the full fury of the south-west monsoon and the rains are copious and never failing.

Crop Associations—We shall now turn to trace the physical and human factors that play a part in the agriculture of the district together with the modifications brought in by contact with the west with its roads, railways and commercial cropping.

Agriculture is wonderfully regulated. The commencement of the agricultural year coincides roughly with the beginning of the rains and perhaps due to the long established custom it also marks the beginning of the Malayalam year. Thus we note that

the beginning of the year also marks the begining of the agricultural operations.

The main cultivated products can be grouped as in the Statistical Atlas of the Madras Presidency under the three heads of wet cultivation, dry cultivation and garden crops.

People and the Home-stead.—In this connection we must constantly remind ourselves of the peculiar customs and the manner of life led by the people in the district of Malabar. The desam is the unit and the labourer lives in the farm. It is a self-contained unit. All the family needs are supplied on the farm itself. Though modern methods of living, the attractions of the roadside and the development of towns lead to small and contiguous houses the 'tharwad' is in essence the main household system in Malabar. In this connection it would be a fruitful source for research as to what conditions determine human beings to live in this manner. It is understood that people live in separate farm houses as we can style a Tharawad in Assam also. Can it be that in areas which are liable to frequent floods people live in such homesteads and satisfy all their simple wants.

Live Stock.—The live stock is ample in proportion to the area under cultivation. Buffaloes do well in the district and by reason of their strength are used for ploughing the wet fields. The cattle are however weak and undersized and this seems to be due mainly to the damp climate and the lack of proper care in fodder supply. Milk and milk products which form a large proportion of the diet of the people on the east coast do not play an equally prominent part in Malabar. Their place seems to have been taken by the cocoanut.

The Agricultural Holding.—The size of the average holding in Malabar is only 6 acres and the assessment is Rs. 15-0-0.

District.	Size of holding in acres.	Assessment.
South Kanara ...	7'89	21—6—0
Nilgiris ...	15'0	10—0—0
Coimbatore ...	8'75	11—6—8
Kurnool ...	9'5	9—15—0
Chingleput ...	3'6	10—1—8
Trichy ...	5'01	8—4—6
Tanjore ..	3'79	18—3—8

The average density of population in the district is exceptionally high, exceeding that of any district in the Presidency other than Tanjore and East Godavari. Since only 7·6 per cent. of the population of the district is classed as urban according to the 1921 census we can realize the pressure of the population over the land. The area of the District has been classified as follows:—

Forest	356,000 acres	10 per cent.
Not available for culti.	774,000 „	21 „
Cultivable	873,000 „	24 „
Current fallow	243,000 „	6 „
Net area sown	1,458,000 „	30 „

It will be seen that each acre of cultivated land has on an average to support about 2·6 persons. Mr. Anstead (a former Director of Agriculture of Madras in a bulletin of the department) expressed his diffidence as to how the yield per acre of land in Madras could be increased when there was soil exhaustion of the worst type and sentiments stood in the way of using the best manure for the fields in the shape of human excreta.

The problem is now to find out how the people are able to cultivate their lands and what advantages they have in their occupation. According to the latest season and crop report of the Presidency the percentage of area sown is distributed as follows:—

Paddy	60 per cent.	Pepper	3 per cent.
Cocoanuts	16 „	Plantains	2 „
Arecanuts	4 „	Others	12 „
Pulses	3 „		

Wet Cultivation.—The cultivation commences as has already been said with the rains. The fields are all well prepared with the advance showers and the land is well ploughed. Two crops of paddy are raised almost throughout the district—the first crop is sown in July. The manner of the sowing is determined by the amount of Rainfall. Copious showers are expected during the growing season and so the seed is broadcast by hand but in the second crop which is mainly to depend in late and uncertain rains in November and December, the seedlings are prepared in a nursery. It is curious that the same conditions prevail in the Chingleput District, but for different reasons. The rains are uncertain till about August and so dry cultivation is practised in wet lands

when the tanks are all practically empty. For the second crop the showers by the N. E. monsoon would be dangerous and so to have sufficient time to reap the crops early and to avoid the danger of the crops being inundated in their early stages the same method of cultivation seems to be adopted.

Though paddy is the essential crop, it is not the only crop. This subsistence crop is closely followed by cocoanut as a garden crop in almost all the taluqs of the district.

In 1927-28 there were 881,000 acres under paddy and 334,000 under cocoanuts. The yield of paddy is calculated to be 554,800 tons while figures are not available for the output of cocoanut. The export of coir and rope from Calicut in that year amounted to Rs. 18 lakhs and so the value of copra must have been much greater.

Extensive plantations of cocoanuts form the chief feature of the littoral region where the palm flourishes in the sandy soil. Every part of the tree is useful to the native Malabari.

In addition to the cultivation of paddy, cucumber, brinjals and other vegetables necessary for household consumption are also grown.

Dry Cultivation — As opposed to the subsistence crops of the plains the money crops or commercial crops are more important in the interior. In general the cultivation is dry and in the slopes of low hills. The essential crops are millets, mainly thenai samai and ragi. Ginger has been a very noted money crop and it is very fastidious in its requirements of soil and manure. The value of ginger which was exported from Calicut was Rs. 3,46,000 in 1927—28.

The whole area of Malabar as of the whole west coast was trading in spices with the arabs in early times; and the most important remembrancer of this fact is the Moplah population who are met with in Malabar. Cardomoms are cultivated in the hill slopes and Pepper constitutes the most important of the spices; and since its value is very great we can just note how it is cultivated and how it is only the west coast that can continue to cultivate it.

This indigenous product was much the more important commodity of commerce between India and Europe in the middle ages. It grows in regions up to an elevation of 3,000 feet. The

foot of the ghats gives the best variety and the utmost yield and it does not thrive as well on the coast. In good and fertile lands the pepper vine begins to flower in the 3rd year. Uniform bearing however does not commence before the 5th or 6th year. From the 10th to 25th year the yield is at its best and it would cost only about Rs. 150 to bring an acre of pepper from planting to bearing stage, but the returns in favourable seasons are as high as 300%. This valuable commodity is exported from all Malabar ports.

The value in Rs. in 27-28 from the chief Ports is :—

Calicut	... 6,31,000
Badagara	... 4,05,000
Tellicherry	... 21,63,000

It must not however be supposed that the conditions are the same throughout the district. In Palghat for instance the conditions of climate and rainfall approximate to those of the east coast; and so cholam and cumbu, the typical dry crop of the neighbouring district of Coimbatore are raised.

About 1910 groundnut cultivation was tried on a large scale. Though it showed some signs of progress it declined and died away. Sugar-cane too has not proved much of a success, its cultivation being only confined to 70 acres out of a total of 13 lakhs of acres.

The native of Malabar cultivates all his requirements in his own garden—betel vine, arecanut, jack and plantain.

In the gardens surrounding the houses every variety of trees is raised; but after the war the cocoanut had an expanded market and so all the compounds became full of cocoanut plantations. In addition to the diversity of crops raised, there is a diversity of occupation also in the coast such as fishing, mat-making, coir picking, rope making and the like.

This district which is blessed with great natural advantages is a prosperous one and in recent years the condition of the agricultural classes has been good. Before the present slump there was a boom in the price of cocoanut. Wages have improved especially in the coastal towns. The extension of tea has done much to improve the prosperity of Wynaad and the rubber estates provide work for a large number of labourers.

The wealth of the district is indicated by the number of tiled houses. Every one lives in his own house surrounded by a fenced garden in which he grows all his family requirements.

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Field Irrigation in Malabar.

By A. Swaminatha Ayyar, B. A.

Editor, Rural India

In its restricted sense irrigation means the process of watering land by artificial means. The Oxford Dictionary gives a more satisfactory definition and irrigation is described as the process of distributing water over the surface of the ground to promote the growth and productiveness of plants. Irrigation and the agricultural conditions and practices of a region are inter-related and both are determined by the physical features and meteorological conditions and the nature of the soil.

Malabar is one of the most picturesque tracts in the Presidency situated in the west coast between $10^{\circ} 11''$ and $12^{\circ} 18''$ N. and $75^{\circ} 11''$ and $76^{\circ} 61''$ E. and is singularly diversified in its configuration. It has an area of 5,795 sq. miles and stretches for a distance of 115 miles along the Arabian Sea from South Kanara in the north to Cochin State in the South. On the east it is separated from Coorg, the Nilgiris and Coimbatore by the Western Ghats which form a continuous mountain barrier, 3,000 to 8,000 feet at a distance from the coast which varies from 20 miles in the north to about 60 in the south and are interrupted only by what is known as the Palghat gap 16 miles wide, the one break in the entire range of the Western Ghats. As are its physical features so also are the social institutions, agricultural practices and the method of irrigation pursued in Malabar which are peculiar and interesting and not usually met with in the other parts of the Presidency. Malabar literally means 'the country of hills'; "Bar" is the Arabic for country. Its ancient name 'Kerala' means the 'land of coconuts' and originally the area included the districts of Malabar and South Kanara and the Native States of Cochin and Travancore.

The district gets the benefit of both the south-west and north-east monsoons, the chief rain-bearing current is the south-west monsoon which blows from the Indian Ocean from the end of June to the end of September. This carries far more moisture than the north-east monsoon but the rain clouds are unable to

pass over the Western Ghats so that in the two west coast districts of Malabar and South Kanara, the rain due to this monsoon varies from 100 to as much as 150 inches. The rain in the neighbouring districts on the other side of the range, except in a tract corresponding roughly to the Agency tract in the North of the Presidency is very much less. The relative importance to the cultivation of the two rain-bearing currents of the south-west and north-east monsoons differs in different areas according to the agricultural practice pursued. The following quotation taken from the Imperial Gazetteer shows the peculiar physical features of the district. "Long wooded spurs with deep ravines run down from the main range of the Western Ghats and are succeeded by gentle slopes and by bare downs with gradually widening valleys of luxuriant cultivation. Nearer the coast the laterite downs shelve suddenly into rice plains and lagoons fringed with cocoanut palms. Along the coast is a level strip seldom more than 2 or 3 miles wide." With the exception of the three tributaries of the Cauveri which take their rise in the district all the numerous rivers of Malabar flow westwards from the Ghats to the sea where they are backed up by the littoral currents and discharge into a line of backwaters and lagoons parallel to the coast. Most of the rivers are navigable by small boats for some miles beyond the tidal influence and many of the lagoons are connected with small canals providing an extensive system of water-ways of great economic and commercial importance.

The agricultural conditions of Malabar differ markedly from those of the Deccan and the eastern portion of the Presidency. The prevailing soil is a red ferruginous loam but on the slopes of the Ghats there is a rich layer of black mould formed of decayed vegetable matter. On the hills and the plateau of the low country, the soil varies from rich loam to uncultivable laterite, the former prevailing mostly in the three taluks of Ernad, Walluvanad and Palghat in which there is considerable 'dry' (unirrigated) cultivation. The best cultivation in the district is to be seen in the low-lying inland villages where the soil is enriched by the surface earth washed down from the hills. The shallower valleys contain a light loam which becomes sandy as they widen out near the coast or clayey where they meet the bigger rivers with backwaters. Beyond the area of wet cultivation there is invariably a

fringe of gardens often reaching to the very top of the hill sides. In some portions, particularly in the southern taluks, the slopes of the hills are terraced and cultivated with wet crops to a considerable height above the level of the valley. The soil of the level country near the coast is poor and sandy and subject to damage from salt water floods. This tract, however, is peculiarly adapted to the growth of cocoanuts, large plantations of which are common.

Both the south-west and the north-east monsoons play a part in the agricultural economy of the district, particularly the former, which give practically unfailing rainfall. There are no irrigation works of any importance in the district. Wet lands are irrigated where necessary by diverting into them the innumerable streams which flow down the valleys, while some of the high-lying fields are watered by baling with pikottahs from small reservoirs in wells. Temporary dams are constructed for irrigation in the upper waters of the Ponnani river and its tributaries in the Palghat and Walluvanad taluks. The gardens are watered by hand from the wells. Bullocks are not used for lifting water as in the rest of the Presidency. The rains are sufficient to mature one rice crop and in the lower regions a second crop of rice may be depended upon, wherever suitable reservoirs have been constructed to give a few weeks' supply towards the ripening of a rice crop after the rains have ceased. The declivity of the country in general is such that, whenever the cultivators wish, all superfluous water could be let off and the fields may again at pleasure be inundated. In some places where there is not sufficient level the superfluous water is thrown out by simple appliances as baskets suspended between poles and worked by two men, wooden spoons and counterpoise lifts as the water level is close to the surface. The above remarks suggest that after all the problem of irrigation need not concern the Malabar ryot as much as draining, even for which there are natural facilities.

Two wet crops are grown in most of the valleys with the help of both the monsoons. The first (kanni) is sown in April and May and reaped in August and September. The second (Makaram) is sown in September and October and harvested in January and February. On some of the best and most favourably situated lands, a third crop is also raised. This is sown in

February and harvested in May. On single crop lands one or other of the above crops is grown. The cultivation season varies with the nature of the land and the facilities available for watering and in some cases extend over ten months.

In the better class of cultivated fields, rice is usually transplanted; elsewhere it is sown broadcast. 'Dry' or unirrigated crops are usually cultivated with the help of the South-West Monsoon rains from May to August. On the lower hills and in *Parambas* (orchards) rice, locally known as "modan," is cultivated once in two or three years; and in inferior soils once in five years. On the better kind of soils in these tracts, a rice crop is usually followed by a crop of gingelly or *samai* (panicum), all the three crops together sometimes occupying the land for a period of 18 months. A mixed crop of rice and millet or *samai* is raised once in 7 or 8 years on the hill sides which are roughly cleared for the purpose by burning the undergrowth.

Rice which is the staple food grain of the district covers roughly 60 per cent of the net area cultivated. Next to Tanjore, Malabar is one of the most important rice-producing districts in the Presidency and in spite of the large area under rice, the district does not produce sufficient for its requirements and rice has to be imported from the neighbouring districts. This is due to the large and growing population of the district. Another peculiar practice in rice cultivation in the district deserves notice. Shallow water-logged areas are drained with the help of a peculiar lift locally known as "chakkaram"; and a coarse variety of paddy is sown and the water is continuously drained off, till the shoots rise above the normal water-level. Does this suggest that there is a dearth of suitable land for rice cultivation? This is a point which deserves to be investigated further.

In the gardens and *parambas* which occupy nearly half the area cultivated, by far the most important crop is the cocoanut palm. Next in importance are the areca-nuts, plantain and pepper. The last named is practically confined to the three northern taluks and Wynaad. Other garden products are the jack mangos, the palmyrahs, betel-vines, cinnamon and a large variety of vegetables, roots and tubers. Ginger for which Malabar is famous like pepper is grown in Ernad, Walluvanad and parts of Ponnani. Lemon grass is grown widely in Ernad. Tea and

coffee plantations are to be found in Wynaad. These garden and plantation crops depend mainly on the monsoon rains and the moisture resulting therefrom.

The peculiar conditions of Malabar offer unique scope and opportunity for converting the water flowing down the hills into some form of cheap and effective energy either before or after the requirements of irrigation are satisfied. Favourable angles in hills could be walled for storage of water with a view to develop mechanical power by means of water-wheels or turbines for the purpose of starting cottage industries. This can be done either on a large scale or on a small scale according to the nature of the country. The several streams that flow down the hills will, I expect, be capable of turning a small turbine - useful even to a small ryot for his own purpose. This question may be investigated having regard to the number of streams flowing and the duration of their flow. Copra, cocoanut-shell and fibre are available in abundance and simple cheap mechanical power might be utilised as suggested above for the purpose of 'pressing oil' in the manufacture of soap for instance and for other industrial purposes, such as manufacture of buttons from the shell, rope, brushes etc. As the subject does not fall within the scope of my paper, I do not deal with it further here.

Some Mediaeval Notices of Malabar Pepper

By Mr. A. Appadorai, M.A., L.T.

The demand for Pepper.

(a) in the West.

The demand for pepper along with other spices in the west arose from the fact that the diet of the ordinary man was coarse, and owing to the absence of winter food for cattle, unwholesome. The desire for spices as far as the mediaeval Englishman was concerned has been well stated by Rogers, "It is difficult for us to imagine the eagerness with which our fore-fathers as far as they could afford the luxury sought after the spices, they were excessively fond of spices as the cookery books of the Plantagenets testify. Spiced wine called Hippocras was a present to princes and a seat near the spice box was a greater privilege than above the salt."—*Rogers, Six centuries*, p. 154.

No doubt this correctly depicts the intensity of the demand in England and this may well be applied to the rest of Europe.

(b) in the East.

It is perhaps necessary at this stage to warn the lay reader against the misconception that pepper entered only in the trade with Europe. A large quantity was shipped to China and the Far East. Marco Polo tells us that he had "heard it stated by one of the Great Khan's officers of customs that the quantity of pepper introduced daily for consumption into the city of Kinsay amounted to 43 loads, each load being equal to 223 lbs."—*Marco Polo, Travels*, ii, p. 204.

Again Polo estimates the tonnage of Chinese Junks by the number of baskets of pepper they carried. He says they were of such large size as to carry 5000 or 6000 baskets of pepper; "every great ship has certain large barks or tenders attached to it"—these are large enough to carry 100 baskets of pepper."—*Marco Polo, Travels*, II, p. 250.

If the tonnage of ships should be calculated in terms of pepper it is evident that large quantities of pepper should have been carried in ships as a matter of ordinary practice. That the

export of pepper to China continued down to the end of the Middle Ages is clear from the observation of Giovanni d'Empoli in 1515. He says that ships carried from Cochin and Malabar 1500 or 2000 cantars of pepper to China worth 15 or 20 ducats a cantar, besides ginger, mace, nutmegs, incense, aloes, etc.—*Quoted by Yule Marco Polo*, ii, p. 239. *Barbosa, An Account*, II, p. 215.

(c) at home.

There was also a well developed home market for pepper. Barbosa, who could perhaps claim a better acquaintance with the habits of the people than any other writer of his age (Beginning of the 16th century)—he even knew the language of the west coast people, Malayalam—says regarding the food of the Zamorin "All the food which he eats whether of flesh or fish or vegetable or other viands is flavoured with so much pepper that no man from our countries would be able to eat it".—*Barbosa, An Account*, ii, p. 23.

That this description was of general application.....and not merely to the nobility whom the Zamorin may be taken to represent is clear from another remark of the same observant writer: Speaking of the Kingdom of Vijayanagar, he says much pepper is used here and everywhere throughout the kingdom.—*Barbosa, An Account*, I, p. 203.

The pepper plant and its cultivation

Regarding the plant and its cultivation Al Idrisi, at the beginning of the twelfth century noted: "It is a shrub having a trunk like that of the vine, the leaf is like the convolvulus, but longer; it bears, grapes like those of *shabuka* each bunch of which is sheltered by a leaf which curls over when the fruit is ripe.....Ibn Khurdadba states that the leaves curl over the branches to protect them from the rain, and that they return to their natural position when the rain is over—a surprising fact!"—*Al arisi, Elliot, History*, I, p. 85

The Spanish Jew Benjamin about 1166 adds that the trees were small and that they were planted in the fields which surrounded the towns and every one knew his plantation well.—*Benjamin, Major, India XLVII*.

In 1293 Marco Polo, also observed that the pepper trees were not wild but cultivated, being regularly planted* and he gives this additional information that the gathering season was the months of May, June and July.—*Marco Polo, Travels, II, p. 375*

Later travellers made a more detailed study of the plant. Ibn Batuta writing in 1340 compares the pepper plant with that of the dark grape. They plant it near that of the cocoanut and make framework for it just as they do for the grape tree. It has however no tendrils and the tree itself resembles a bunch of grapes. The leaves are like the ears of a horse but some of them resemble the leaves of a bramble.—*Ibn Batuta, (Lee.)*

Marignolli also says that "this pepper grows a kind of vines, which are planted just like in our vineyards. These vines produce clusters which are at first like those of the wild vine, of a green colour and afterwards are almost like our bunches of grapes."—*Marignolli, Yule, Cathay III, 217. See also Odoric, Yule, Cathay, II, 133-36.*

Stefano (1499) and Varthema (1504) agreeing with the previous writers in essence, would prefer to compare it with the ivy. The pepper trees are similar to the ivy. The pepper trees are similar to the ivy, because they grow round other trees wherever they can attach themselves, their leaves resemble those of the ivy."—*Stefano, Major, India, p. 4*; and Varthema as it were completes the idea by saying that it embraces and climbs as high as the wood or tree which it can grasp.—*Varthema, Travels, p. 157.*

He continues his description by saying that the said plant throws out a great number of branches, which branches are from two to three palms long. The leaves of these branches resemble those of the sour orange, but are more dry and on the underneath

* As to the cultivation of pepper in regular gardens, it is interesting to note here that in the Middle Ages, there was an idea prevalent that pepper was grown in a forest. Odoric speaks of the pepper jungle which extended for a good eighteen days journey, and in that forest there be two cities the one whereof is called Flandrina and the other Cyngilin. (*Jordanus, Cathay III, p. 133.*) Marignolli about 1348 has a mild attack directed at Odoric's talk about the pepper forest, (*Marignolli, Cathay III, p. 217.*) As Yule puts it, apparently the latter (Jordanus) did not stay any time in Malabar, and he probably derived his information from harbour gossip. (*Yule, Cathay II, p. 136, n. 4.*)

part they are full of minute veins. From each of these branches there grow five, six and eight clusters a little larger than a man's finger, and they are like small raisins but more regularly arranged and are as green as unripe grapes.—*Ibid.*

It is interesting to note that the analogy of the man's finger is applied by Stefano, five years earlier, not length—for he says that the clusters are of the length of half a palm or more—, but to describe its thickness—he says the bunches are 'as slender as a finger.' *Stefano, Major, India, p. 4.*

The minute attention paid to the study of the crop is apparent from the fact that Varthema observed that after the planting stage, it required little attention. 'These people neither prune nor hoe this tree which produces the pepper' and they gather the harvest 'without doing anything else to them.'

This statement is so correct that a similar description from the pen of a modern writer would seem to be based on it. "After it has been planted it requires no great trouble of attention, the cultivator having little more to do than to collect the produce in the proper season." (Thornton's Gazetteer.)

The gathering of pepper

An interesting piece of information regarding the gathering of pepper is supplied by the Tao i chih lio, (1349: The Tao i chih lio, T'oung Pao, XVI, p. 453, referring to Hili.) 'The people for the most part do not mind its flavour but if they do, they get relief by using a decoction of Chiren-hsung.

Season for Harvest

About the season of harvesting also a fairly correct study was made. Marco Polo's statement that pepper was gathered in the months of May, June and July does not find support in the other writers who have touched this point. Ibn Batuta definitely states that 'when the autumn arrives they then cut it.'—*Ibn Batuta (Lee), 168*, and accepting the difference between the astronomical and popular application of the term (See Webster, s. v. autumn) autumn cannot be carried back earlier than August. Varthema also says that they gathered them in the month of October and November.—(*Varthema, Travels, p. 157.*)

The difference between the earlier and the later writer seems hard to explain; but this touches on an important question

connected with the pepper trade. For the season of harvesting was connected with the preparation of the product for the foreign market. Two kinds of pepper were in demand, the black and the white. When the fruit was intended for black pepper, it was not allowed to ripen, but was collected *green*, and became black. This is testified to be the clear statement of Varthema. (*Varthema Travels*, p. 157. *Stefano would have it 'five or six days' Stefano, Major, India, p. 4.*)

'They gather them in this green state and then they lay them in the sun for three or four days when they become as black as they are seen amongst us,' and Stefano supplements the information by his statement, it becomes black and wrinkled as we see it. (*Stefano Major, India, p. 4*) and if we may believe Odoric after it was dried, it was also stored in Jars, preliminary to export.

That which was intended for white pepper was left to ripen thoroughly till the berries were covered with a red pulp—which being washed off left the pepper corn white and was dried merely to make it fit for the market. Drying also helped according to the Tao i chih lio to remove its pungent flavour.—(1349, *Toung Pao*, XVI, p. 453.)

Some Interesting Misconceptions

It is interesting to recall that until the end of the thirteenth century the misconception persisted that they were two distinct species, that the black was prepared out of the white or that the white was what was gathered before it was fully ripe. Idrisi in the twelfth century distinctly says that white pepper is what is gathered as it begins to ripen or even before.—(*Idrisi, Elliot, History, i, p. 85.* That they were of two distinct species is given expression to by Marco Polo.—(*Marco Polo Travels, ii, p. 264; In those islands (of the sea of China) grows pepper as white as snow, as well as the black in great quantities.*)

But the most interesting was the attempt to derive the black from the white. Benjamin noted the pepper is originally white, but when they collect it they put it into basins and pour hot water upon it, it is then exposed to the heat of the sun and dried in order to make it hard and more substantial in the course of which process it becomes of a dark colour.—(*Benjamin, Major, India, p. xlvii.*)

It appears as though it was only in the fourteenth century that correct ideas were formed on the subject. Friar Jordanus was apparently the first to refute old notions. He indignantly says 'nor are you to believe that fire is placed under the pepper nor that it is roasted as some will lyingly maintain.'—*Jordanus, Wonders, p. 27*; and Ibn Batuta writing ten years later in 1340 supports the indignant friar. He emphatically says that as to what some have said that they boil it in order to dry it is without foundation.—*Ibn Batuta (Lee) p. 168.* That this correct idea had become fairly well-known is seen from the fact that eight years later Marignolli also says there was no roasting of the pepper.—*Marignolli Yule, Cathay, III, p. 216*; and he is later supported by Stefano and Barbosa.—(*Stefano, Major, India, p. 4. Barbosa At Account.*)

The Quality of Pepper

Regarding the quality of pepper, there seems to be little doubt that Malabar pepper was superior to that of the Archipelago (*Barbosa, An Account, ii, p. 184*), but even within Malabar a word of praise was sometimes given to the pepper produced in the kingdom of Cananore in North Malabar and Hili. (*Barbosa An Account, ii, p. 83. Marco Polo, Travels, ii, p. 388. Toung Pao, XVI, p. 453.*) The pepper of the latter place was according to the annals, "superior to that of any other foreign port."

Ports of Shipment: Customs Duty

Regarding the ports of shipping for pepper we may point out that Quilon was the chief centre till the 14th century, when Goa, Cochin and Calicut became important; (*Regarding the abundance of pepper at these ports, see the Hsing Cha Sheng law, (1436), the Toung Pao, XVI, p. 452*), we have not much information regarding customs duty beyond the statement that in 1349 at Calicut it was two tenths.—(*Tao-i-chih lio, Toung Pao, XVI, p. 454.*)

Price

The price of pepper also seems to have received scant notice till the beginning of the fifteenth century. In 1409, Mahuan noted that the article was sold at Cochin at 5 taels the Poho.—(*J.R.A.S. VI, p. 344*, which would work out at less than a penny a pound.—(*The Poho is taken here to represent 534 lbs., and the tael at 6s. 8d*

J. R. A. S. vi, p. 334. *Pepper apparently sold at Cochin at £1-13-4 for 534 lbs. or less than a penny a pound.*)

Change in Demand

It is likely that the demand for pepper has gone down in proportion to the growth of population in modern times and the explanation may be ventured that it is due to two factors, probably equally important in their effects—the use of substitutes and changes in habit. It is interesting to observe that the former applies to the home market and the foreign in two different ways. In the West pepper was in demand largely for the preservation of meat; cold storage has taken its place and diminished the demand for pepper; at home in South India, Chillie has come in as a substitute and proved an attractive substitute. The changes in habit refer to the remarkable change in the habits of the Chinese people. The quantity of pepper used by the Chinese in Marco Polo's time is put by him thus: For one shipload of pepper carried to Alexandria for the consumption of Christendom, a hundred went to Zayton in Manzi; (*Marco Polo, Travels, ii*), but now according to Mr. Williams (*Quoted in Marco Polo, Travels, ii, p. 210, n. 7*), the Chinese use little spice. Pepper is in use chiefly as a febrifuge in the shape of pepper tea and that even less than they did some years ago.

Markets for Malabar Produce

(*Pepper, Ginger and Cocoanut Products.*)

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Malabar has maintained from quite ancient times a direct trade with the Mediterranean and later on with Western European countries in her old speciality, the spices. Pepper and, to a smaller extent, other spices like ginger and cardamom were in great demand for flavouring and preserving food in cold countries. The Malabar Coast had a practical monopoly of the spice trade of the world until recently and even now retains an important share in spite of increasing aggregate consumption in this country and competitive supplies abroad. As pepper forms the theme of more than one special paper at this Conference, no attempt is made here to deal in detail with the history of the trade or the present practices in the cultivation and curing of that commodity. A few striking changes that have characterised the trade in that and two other lines of special produce—ginger and the cocoanut products of copra, cocoanut oil and coir—in which Malabar excels not merely all other districts in the Madras Presidency but the rest of India as well, and the economic problems they give rise to are sought to be presented here.

Pepper was typical of the produce handled in the international trade of the old world. It was an article of small bulk and high value; universally sought after at prices far higher than now, it could afford to cross the seas and stand the high cost of transport.* It was in fact the prospects of profiteering in pepper that induced the Portuguese to discover a new sea-route to India and drew a few other European nations in the same direction. While pepper and other spices still continue to be raised and exported by Malabar, they have become relatively insignificant by the side of the trade in bulkier and cheaper commodities like copra, coir, raw rubber and timber which under modern methods of quick and relatively inexpensive transport are dealt in on a colossal scale.

* Chisholm, *Handbook of Commercial Geography*, p. 513.

Excellence of Malabar Produce—Most of the special products of Malabar have long maintained a reputation for quality which is in refreshing contrast to the general ill-repute in which Indian goods are held in international markets (particularly Indian cotton and cotton seed, groundnut, jute and hemp.*) But the high quality goods of Malabar, as of some other lands, have shown a tendency to suffer relatively, rather they ceased to attract the high premium of old, for more reasons than one: the increase in *industrial* uses of certain materials for which quality is not essential, the improvement in the processes of refining, the multiplication of the same or substitution by similar produce raised in other parts of the world, particularly on the reclaimed or reorganised lands in the tropical possessions of Western nations. These factors will be found illustrated below. It must be a matter of special interest to us to trace in the meanwhile the influence of environment and the man on the excellence of Malabar produce.

Pepper. Malabar pepper, particularly the *Balamcottah* variety sold at Tellicherry, has held the field for long and it is even now unrivalled in quality. It is not merely bolder and heavier than the other varieties; but it has the habit of flushing all over at the same time, so that the berries can be harvested all at one time, which is a great economic advantage. The hot and moist climate, the soil rich in humus at the foot of the hills and the great care and skill in cultivation handed down from centuries—all account for the high yield.

Ginger.—The ginger of Malabar, known in mediaeval times as *Columbino* (perhaps from the the port of embarkation, Collumbum or modern Quilon) and now as 'Cochin ginger' has been the best in India and ranked far higher than that of Bengal and Bombay and not unoften realised the prices that ruled for the high grade ginger of Jamaica. The acreage yield has been the highest in Malabar compared with that of the rest of India or even of Jamaica.* This may be attributed to the good rainfall to start with, high temperature during the growing season, rich red earth, splendid natural drainage, heavy manuring and careful weeding. The curing of the green crops with a view to conversion into the

*Report of Royal Commission on Agriculture in India, pp. 398-99.

* Bulletin of the Imperial Institute, London, 1926, pp. 867-82.

dry ginger of commerce used to be much better done in Malabar than in Sierra Leone (British West Africa), the largest exporter of ginger. That country is said to have great potentialities for development of ginger; but it has not had a reputation for quality. It is said to be badly prepared and to secure a lower price. "It is often put in the market improperly peeled, poorly cleaned and badly bleached.*"

Copra.—Malabar copra has been always acclaimed as the best in the world's market; superior to the smoked product of Ceylon, Strait Settlements and of the Philippines. Market prices for Malabar copra have always been in excess of prices quoted for the product of other countries. Not only has it a distinctly better appearance, but it yields 68 per cent of oil while Ceylon's yields 65 per cent and Manilla's only 59 per cent.† Malabar copra is usually very carefully prepared, though a little lack of care was noticeable in times of high prices when all goods found a ready sale.‡ It is not merely the climate of Malabar, which has a distinctly dry season for sun-drying copra as contrasted with Ceylon and Philippines, with their uncertain weather where artificial drying by kiln-smoking or hot-air rotary processes has to be resorted to; but the individual care and attention bestowed at every stage of cultivation and preparation by the numerous small producers that has won for Malabar copra its special fame.

Cocoanut Oil.—The cocoanut oil of Malabar, known in commerce as "Cochin Oil" is again said to be the "finest cocoanut oil in the world." Care is exercised in the selection of the nuts for crushing as well as in actual milling, which is mostly done by the small power 'chuck mills' at present. Even coir, known to early Arabs as *kanbar*, 'Alapet coir' which is fine and light or golden coloured as distinguished from the coarse, dark fibre produced in our east coast, and in the islands of the Far East, has always fetched the highest price. This superiority is attributed severally to the soil and water used for steeping, beating and cleaning the fibre, to the existence of creeks or backwaters with tides that wash away discoloured water, to the age at

* Benu's Resources of the Empire, Vol. V. p. 269.

† Indian Munitions Boards Industrial Handbook, 1919, p. 250.

‡ Report of Agricultural and Trade Conference, Madras, 1914.

which the nut is gathered, and to the care and skill bestowed in the above processes by the people of Malabar.* Attempts by the Department of Industries of Madras† to develop the coir industry, on the scale and lines of the West Coast, in the Godavari and Tanjore districts in the East Coast of the Presidency have shown little signs of success in the absence of the above geographical and other conditions.

The Cocoanut.—The factors that favour the cultivation of the cocoanut itself merit our attention for a while. Malabar has by no means the monopoly of cultivation of cocoanut in the Madras Presidency; it is a familiar crop on the coasts of peninsular India and is even scattered inland, principally in the river valleys of the peninsula. Madras Presidency is said to have a total of nearly 553,000 acres under cocoanut, of which as much as 327,000 acres are found in Malabar. No other district except Malabar, and Godavari and Tanjore which come far behind, has any considerable surplus for export, as the crop is mostly used up in domestic consumption. The presence of salt-air and a loose sandy soil seem to be beneficial to the trees which is, therefore, extensively planted on the littoral region. But the East Coast is not so well suited as the West Coast with its better natural drainage and the underground flow, from the rising land behind it, of fresh soil water which is more important than rich soil‡. But the hard-working Malayalee has not left it all to nature. The work of man is nowhere more evident than in the soil prepared for cocoanut which is planted on the banks of the backwaters and the rivers. “The soil is very rich consisting of heavy black mud reclaimed from the bottom of the lakes and is largely transported in boats and heaped in small mounds along the canal and river banks as well as along the bunds of paddy fields.§ The use of special fertilisers like oil-cake, milled fish and bone meal has also come into vogue in times of high prices on the advocacy of the Agricultural Department. There have been no doubt complaints of inefficient cultivation, inattention to seed selection and even deliberate overplanting, thanks to the compensation for

* Report of the Cottage Industries in Malabar, etc., 1928 p. 3.

† Report of the Department of Industries, Madras, 1929-30.

‡ C. A. Barber, Tropical Agricultural Research, (E. M. B.), pp. 72-77.

§ Madras Agricultural Department, Year Book, 1918 p. 122.

Tenants' Improvement Act, particularly in areas where tenurial troubles were greater as in parts of North Malabar.* And yet it is true to say that nowhere else (than perhaps in some well-organised estates in the Straits Settlements) that the cocoanut receives so much attention as in Malabar—where the manifold uses of the tree and its products have rightly entitled it to be called the *Kalpakavriksha of Malabar*.

Internal Trade.—The export trade of Malabar has always attracted much greater attention than the internal trade, whose value it is impossible to measure in the absence of statistics of rail and road borne trade. Malabar has an extensive sea-board with half-a-dozen ports of varying importance which carry on a brisk trade in the non-monsoon months of the year and a unique system of waterways along the coast in the backwaters. It has a large coastal traffic with Bombay, and imports rice from the Circars and Burma for a large part of her requirements of which there are varying estimates. Rice is the staple food for people, little or no millets being raised or consumed in the district; but though rice occupies a little more than half of the cultivated area it is almost all rain-fed and the yield is low compared with that in the eastern deltaic districts; production hardly suffices for the needs of this thickly populated district. (For in spite of large areas covered by hills and forests, Malabar has the highest total population for any district in the Presidency; and while in respect of density to total area she takes the fourth rank among the districts, judged by a better economic criterion, *the density per cultivated acre*, Malabar stands first.)† Palghat is the only taluq which is self-sufficing in respect of rice; it indeed exports some surplus to neighbouring Coimbatore. Other taluqs have to import rice.‡

On the other hand most of the food requirements of Malabar are met by the produce raised on the soil of the district. The spices, the cocoanut, the mango, the plantain, the jack and tapioca—most of these make up the poor man's food—under all these crops, the cultivated area in Malabar far exceeds that of any other district in the Presidency and makes Malabar far more

* Indian Munitions Board Handbook, p. 276.

† Census Report, Madras, 1921, p. 22.

‡ Statistical Atlas of the Madras Presidency, 1924.

self-contained than one is likely to imagine by the volume of her foreign and coastal trade.* There is no doubt, however, that in the case of Malabar, her external trade is of far greater interest to us; for she has a practical monopoly of some produce, particularly pepper and ginger and a very large surplus of cocoanut products which she offers in exchange to the rest of the world, which indeed she has been induced to multiply by the profits of foreign trade in the past. This export trade of Malabar then surely merits our special attention at a time of adversity which threatens to be more prolonged than any one apprehended; though we are seriously handicapped by the want of self-contained statistics relating to this district as regards every aspect of her trade and production.

Decline in Pepper Export. The position of pepper is by no means the worst; and judged by prices (except in the recent depression when pepper price has gone down from a rupee per pound to 6 annas) it has not fared badly at all. There has been however a striking fall in the volume of exports in the War and post-war periods from the Madras ports. Malabar lost her monopoly in the world trade of pepper long before the War; the spread of pepper cultivation in the 19th century in Siam, Indo-China, Sumatra, Malay Peninsula and Strait Settlements told heavily, and in the last 40 years Malabar's export of pepper has fallen relatively to the pepper export of the world as well as to other products of Malabar. In fact, ever since the War began, we find a tendency to absolute decline in the volume of export of pepper, though we find occasional spurts of increase as for instance in 1929—30, to fill up the gap caused by deficient supply from Lampongs and Spice islands.† There is on the other hand a definite and steady increase in the area under pepper in Malabar in the last 15 years - from 62,000 to 70,000 acres (the area in South Canara, the only other district in the Presidency growing pepper, has risen from 4000 to 9000 acres).‡

Where then has the increase disappeared? The internal consumption in India ought to have on the aggregate increased with the increase in population not merely of Malabar but of the

* R. C. Wood: *Agricultural Facts and Figures*, 1928.

† Review of the Trade of India in 1929-30, p. 115.

‡ Season and Crop Reports of the Madras Presidency 1916 to 1930.

rest of this vast country which depends to a very large extent on the crop raised in Malabar and Travancore. Bombay Presidency has but a tenth of the area of the Malabar district (almost all in North Canara). The rest of India produces practically little; North India has indeed to import considerable quantities (over 1 million lbs. per year) from the Far East.

Fall in Consumption.—As against this, the tendency for consumption per capital is to go down not merely in India but over the whole world. In South Indian homes it is to some extent displaced by chillies, while its use in drugs cannot be profuse as in the days of undisputed Ayurvedic supremacy, when indeed few prescriptions were free from it. In Europe far less pepper is used at present than in good old days.* The refrigerator has given the go-by to pepper as a preservative of meat and fish; while for flavouring food, its demand has gone down due to the great increase in the variety of dishes. In the drugs trade in the West, pepper is used very much less than either ginger or cardamom.

Italy is at present the largest importer of our pepper. United Kingdom usually comes next, though she imports several times more from Singapore, the emporium of spices of the Far East. She re-exports much of what she imports and acts as a clearing house with her historical associations with the pepper trade and the large area under pepper in the British Empire. United States has in the last year (1929—30) taken even more of our pepper than the United Kingdom. Germany and France are our other customers but come far behind. It is interesting to note that prior to the War, shipments of pepper to Germany were unusually heavy; pepper was said to be an ingredient in the manufacture of tear shells; it is not known how far pepper is pressed into this service at present.†

The Prospect for Pepper.—On the whole the demand for pepper has not increased in the recent past as fast as the area has multiplied in the world. This should have reduced its value but for the fact that its use in proportion to other food is so small. It has in fact not suffered so seriously in times of bad trade as the

* E. Lewin. *Resources of the Empire*, 1924, p. 181.

† C. W. E. Cotton; *Handbook of Commercial Information for India*, 1924 p. 280.

staple food products have. On the other hand, considerable areas of pepper are now and again attacked by pests, as for instance in Sarawak, where it is said to be dying out, due partly to careless management and partly to rapid deterioration of soil under this exhausting crop except where fresh deposits of silt are available every year.* Malabar may not, therefore, entertain any great fear of the future of her pepper, though scope for expansion is surely limited, both on account of the scarcity of suitable land and of the universal tendency to diminishing consumption.

Fall in Ginger Export.—Ginger is more extensively grown in India than pepper but internal consumption is quite great and the West Coast alone (including Cochin and Travancore) is able to release ginger for export. India was the biggest exporter of ginger prior to the War but it is now closely followed and is sometimes overtaken by Sierra Leone in British West Africa, whose potentialities for further development are great but cultivation and curing are far from satisfactory. Some of the West India islands, particularly Jamaica, produce finer grade but export smaller quantities. There is perhaps some deterioration in the stock of indigenous ginger in Malabar and it may profit her to try the Jamaican variety. Perhaps it has received greater attention in Travancore which is sending out larger and larger quantities, while export from Malabar ports has positively declined in the last 15 years and particularly since 1921.

A more recent complaint is that Malabar ginger has an excess of injurious sulphurous matter, acquired in the process of curing which, by the way, is done by exporting firms for appearance as well as for preservation from insects; and in consonance with the legislation for Public Health Regulation (Food preservation, etc.) passed in 1925, all such ginger is prohibited from entry into the United Kingdom. This country and United States have been our greatest importers but this measure has dealt a severe blow to our trade with England. It is up to our Departments of Agriculture and Industries to help in the removal of this handicap and restore the trade in ginger of Malabar. Meanwhile the growers have had to reduce the area under the crop as the increase in internal demand could not compensate for the great

fall in export. Fortunately—unlike pepper and cocoanut which are crops of long-time production—the area under cultivation of ginger can readily react to prices.

Future of Ginger.—Granted an improvement in the methods of curing, there is no need to fear the future of ginger in Malabar. Unlike pepper, the demand for ginger is on the increase in confectionary, in soft-drinks and in the drugs trades. It should be worth while for Malabar to try the preparation of ginger-oil for use in drinks or drugs, and the preservation of ginger in honey or syrup as is done in China which produces for the purpose a very succulent rhizome.

The Career of Copra.—It is the foreign trade in copra that has had a meteoric career in striking contrast to the steady old trade in spices. Malabar must have had her cocoanut in ancient times; it was well-known to mediaeval travellers like Marco Polo but the export trade in copra is quite modern. It may be traced to the nineties of the last century when a German scientist invented a method of deodorisation of cocoanut oil; quite as important was the introduction of the hydrogenation process by which cocoanut oil could be hardened into a substance (named by a firm in Mannheim as *Palmona*) looking very much like butter and having several of its properties.* We are told that it contains vitamin D which few vegetable oils possesses, though it is inferior to butter or *ghi* which has also other vitamins. Cocoanut oil is freer from fatty acids, does not get rancid so readily as even palm oil, which resembles it most, does; and cocoanut butter is therefore said to be preferred by bakers and biscuit-makers. Copra has other economic advantages as a raw material not possessed by other oil-seeds; it could be harvested all the year round; it is much less affected by weather conditions; estimates of supplies could be more correctly made and fluctuations in prices would be less wide than for other oilseeds.

Germany was the greatest importer of copra which she crushed in the mills installed on the banks of the Elbe. Prior to the War she was taking 75 per cent. of our exports. South India was one of the earliest countries to take advantage of the growing demand and the two decades prior to the War were the boom period in planting. The pressure of cocoanut cultivation was

* J. Russell Smith, *The World's Food Resources*. p. 319.

* Bann's Resources of British Empire, Vol. V. p. 253.

felt on hill tops while it encroached many a wet field growing paddy in the past; and the usual alarm was raised of the spread of this money crop at the expense of a food crop. We have, however, no statistics of the spread of cocoanut prior to the War, and one cannot be quite sure of the returns made from 1917 of a comparatively scattered crop like the cocoanut in the *Madras Season and Crop Report*. The figures for the last fifteen years reveal only slight increase in the area in Malabar. It is from 324000 to 348000 acres.

Foreign competition—While our country had the earlier start and the advantage of cheap but skilled labour and profited in the period prior to the War, production and trade were stimulated on a large scale in many tropical islands of the Indian and Pacific Oceans. European capital and enterprise found employment in the creation of big estates on more or less virgin soil in the first fifteen years of this century and this has in course of time led to a tremendous increase in the export of copra from those lands to Europe and the United States. According to an authoritative estimate the world's export of copra was 189,600 tons in 1900, while in 1928 we find it has risen seven-fold, to 1,269,700 tons. On the contrary our export of copra has suffered a complete collapse after the War. While it headed the list of exports from our West Coast ports in 1913-14 with a tonnage of 38,000 valued at Rs. 130 lakhs, shipments of copra from our ports to foreign countries declined in 1929-30 to one ton valued at Rs. 642.

Our old customers.—The fall in our copra trade began at the outbreak of the Great War when Germany which was our greatest importer was most adversely affected by it and her great milling industry, along with other industries, was thoroughly dislocated. German oil-milling industry has, however, contrary to general ideas prevailing in our country, wonderfully revived now and she is again the greatest importer of copra—but from other parts of the world. During and after the War our copra export was to some extent revived and diverted to the United Kingdom and the United States; but it was far from developed in spite of enthusiastic attempts to promote inter-imperial trade. Even during the War, the oil milling industry that in Germany had been protected by tariffs on oils, fostered by German banks, and

granted special facilities by shippers and port-trusts formed the subject of a close enquiry by the Imperial Institute in London; and the resultant report advocated similar forms of help towards the encouragement of oil-mills in the United Kingdom.* The latter, however, has not taken kindly to the manufacture of cocoanut oil from *kernels*; her mills have been designed and developed for the crushing of others oil-seeds like linseed, rape-seed and cotton-seed. On the other hand, France which had been the foremost importer of ground-nuts for the manufacture of ground-nut oil has now developed a big cocoanut oil milling industry and is now closely following Germany in respect of copra imports. Holland is the third great importer of copra from her colonies and other islands of the Far East, though Java which is a great producer of copra is crushing the same to an increasing extent and exporting the oil. The supplies to the United States are mainly from the Philippines, while Ceylon and Straits Settlements which have vastly developed cocoanut cultivation distribute their crops more widely.†

Coasting trade.—While Malabar's export of copra to foreign countries has dwindled into insignificance, she maintains a steady volume of coasting trade in copra, and in cocoanuts too, to other Indian ports, particularly to Bombay and Karachi and to some extent Calcutta.‡ One is inclined to believe, though no statistics can be cited, that cocoanut is entering more into domestic consumption in India in some shape or other with the fall in prices.

Oil-milling industry.—Though the fall in foreign trade has affected the producers badly and the prices particularly in this depression period have slumped disastrously, the War has been a blessing in disguise so far as the cocoanut oil industry is concerned. It has led to a remarkable, though not exactly measurable, growth in the production of oil from copra in nearly 5000 small mills and some big power mills, the most important of which is Tata's at Cochin. The temptation to convert the large surplus into something less bulky and more in demand within the country, if not without, is irresistible. In the case of a tree

* *Indian Trade Enquiry, Reports on Oil-Seeds, 1920.*

† *International year book of Agriculture Statistics 1929 (Rome).*

‡ *Report on the Sea-borne Trade of the Madras Presidency for 1929.*

crop like cocoanut neither shrinkage in area nor abstention from working (as in rubber tapping) could be thought of, though the idea of further expansion would not be entertained.

The export of oil-seeds on a large scale from our country has been a matter of reproach and we have been exhorted to stop this and substitute instead the export of oils and any other oil products but oil-cakes. Vegetable oil has become the basis of a wide range of industries in European countries, particularly in France and Germany. If we cannot with the present insufficient scientific and technical equipment in our country proceed so far, we can at least manufacture and export oils of all kinds on a much wider scale. We would be not only giving scope for more Indian capital and enterprise but employment for a large number of workers in our rural areas either permanently or in the off-season on land. The freshness of oilseeds, would improve the quality of oils and above all the oil-cakes could be retained and used as cattle food or as manure directly. The prevention of this 'illegitimate export' is needed to arrest the depletion of the fertility of our over-worked soils.

Export of oil.—While we may not, therefore, lament the fall in the export of copra, we do not find any increase in the export of oil. There is in fact a progressive decline in the export of it in the last five years. This may be due partly to the larger demand in India, but the fall in demand in European countries is more important. While Holland and Great Britain are still large consumers of cocoanut oil, France and Germany, by a policy of discriminating tariffs, in favour of seeds but against oils, with a view to protect their big mills have made it difficult for our oil to enter those countries. There is also an inherent difficulty in the transport of cocoanut oil; the cost of containers is heavy in proportion to the cost of oil; while tank steamers for carrying oil are ruled out because of the tendency of this oil to get frozen even with a temperature of 70° F.*

A Rival Palm.—Another factor that has adversely affected the trade in cocoanut oil is the growing competition of the palm and palm kernel oils which are increasingly used in the margarine and soap factories of Europe. The West African palm has not

only been more widely cultivated in Nigeria, Sierra Leone, Congo and other parts of West Africa where European factories like Lever Brothers have acquired extensive interests, but it has been introduced in Malay States and Dutch East Indies with great success. The export of palm and palm kernel oil has increased from 1909 to 1929 from nearly 270,000 tons to 440,000 tons; while that of palm kernels has risen in the same period from 374,900 tons to 561,600 tons from the producing countries.

Advance in oil technology.—Above all the decisive blow to our trade in copra and cocoanut oil has been dealt by the improvements effected in the refining and deodarisation of other vegetable oils which not long ago were deemed unfit for the manufacture of edible products like margarine and were used for soap and other industrial uses.* It is not that there is no demand for copra in the West, but the high grade product of Malabar is no longer such a necessity in the margarine factory except in comparatively backward Scandinavian countries where processes of refinement are not perfect. In fact the interchangeability of oils is an achievement of great importance to the credit of oil technologists in the necessitous war period. So far as South India is concerned, the special product of *vegetable ghi* which is an entirely post-war preparation from groundnut oil and is largely concentrated in Holland gave a fillip to our groundnut trade until the recent depression set in. This vegetable *ghi* is made to look and smell like natural *ghi* to such an extent that it has displaced almost all other adulterants of *ghi* in the last few years. We are importing 400,000 tons on an average every year for the last 3 years, principally from Holland and to a small extent from Belgium. Groundnut oil seems to be preferred for this purpose to cocoanut oil.†

Demand for groundnut.—But even groundnut is by no means having a good time of it now; the recent trade depression coming on the top of a powerful combine of European importers of raw materials for oil, margarine and soap industries—the *Uni-lever* trust—has brought down prices to unremunerative levels; consequently harvesting of old crop was carelessly done and the new crop is sown to a much smaller extent. Such a ready response

* Encyclopædia Britannica, Vol XVI, p. 745.

† Royal Commission on Agriculture in India, Vol. X, English Evidence, pp. 442-444.

* C. W. E. Cotton, *Hand Book of Commercial Information*, 1924, p. 193.

in area to price-reduction is impossible in the case of a tree crop like cocoanut or even pepper. In the absence of any elaborate processes of refinement, deodorisation and hydrogenation in this country, cocoanut oil is in many parts preferred to groundnut oil for edible purposes. If even such experiments in oil technology contemplated to be carried out at the Kerala Soap Institute, Calicut, were successful, one wonders whether the cocoanut oil would maintain its preference to groundnut oil which is said to be better suited for the manufacture of vegetable *ghi*, very much more demanded in India than margarine or vegetable butter. It is possible however to stimulate the demand for cocoanut oil products on the basis of their higher nutritive value. But this means a vast educational campaign.

Soap Industry.—The development of soap factories, now over 125 in the Madras Presidency but most of them small, is by some looked forward to as a hopeful outlet for more cocoanut oil which is mainly used as the base in most factories as it has a higher saponification value.* But the multiplication of these factories has been due to some extent to the fall in the price of cocoanut oil, though the main impetus has been the movement of boycott of foreign soaps. Unless this movement is maintained or the State adopts a more rigorous policy of protection against the formidable foreign combine—the Uniliver trust—one cannot be sure of the future of our soap factories. Malabar itself is situated too far from the larger consuming centres of soap, for us to expect any great development of the industry in the district. This is the lesson brought home by the experience of the working of the Kerala Soap Institute.† Even granting an expansion of the soap industry, the demand for cocoanut oil for this use would at best be limited. In Western countries it was 'the diversion from the soap pan to the margarine churn' that enhanced the demand for and value of vegetable oils. And so in this country too, where masses of people are too poor to buy *ghi*, we have to look forward to the increase not so much of soap factories as of the consumption of edible oil products for absorbing the surplus of copra and cocoanut oil available in Malabar and elsewhere.

* Report on Cottage Industries in Malabar, etc., 1928, p. 43.

† Report of the Industries Department, Madras 1929-30.

Coir.—A word might be said about coir which is a by-product of copra. This important cottage industry did not suffer to any considerable extent even when copra export was declining. The recent depression however has affected it acutely, as it has done many other industries. It is hoped that stocks in foreign countries would have now run out and that the revival of general trade would again lead to a great demand for coir.

Expansion or Conservation.—Now the last question, whether there is scope for the extension of the area under cocoanut in Malabar, is easily answered. Until the demand for copra is not only revived as of old, but shows a persistent tendency to overtake supply, it would be folly to add to the area under cultivation. There are certain inherent handicaps, economic as well as agricultural, in the cultivation of tree crops which it is well to bear in mind.* And this also applies to a crop like pepper which takes at least 3 years to reach the bearing stage and goes on yielding for 15 years, while the cocoanut begins to bear fruit after 6 or 7 years but goes on yielding for over 50 years. Not only does the long period of waiting between planting and reaping add to the cost of raising the crop; but work has to be done in bad season as well as good in order to keep the plantation healthy and realise, if not profits, the overhead charges. There is no rotation of crops possible, with the result that the soil tends to become 'sick' unless well supplied with fertilisers. The adjustment of area to annual demand is out of the question; and the anticipation of demand five years hence or after is attended by risks. Booms and depressions become inevitable even more than in rubber, as in the latter case producing capacity can be kept in reserve by suspending tapping. Storage of copra for over a year is not feasible either. We may therefore conclude that even after the lifting of the present depression, a policy of conservation which includes the maintenance of existing plantations on a remunerative basis and the improvement of the yield and quality of the crop is much the wiser course to adopt than extension. We are indeed afraid that the palmy days of the cocoanut palm are over.

* Benn's Resources of the Empire. Vol. V, pp. 20-2.

Cottage Industries of Malabar

By Mr. R. Suryanarayana Rao, B.A.

of the Servants of India Society.

To a casual observer, Malabar appears to be a land of lotus-eaters, peculiarly rich in every way with a copious rainfall, abundant and luxurious vegetation and in fact with all blessings which nature can bestow on a people living on this earth. But a careful study of the economic conditions prevailing in the district will dispel all such exaggerated notions. Almost all the land in Malabar is the private property of a few landlords. The density of population in the Presidency reaches its maximum in the Malabar district. While the number of persons per square mile of the total area in the presidency is 297, it is 535 in Malabar. Taking the area under cultivation alone, it is 1498 in Malabar while it is 780 in the presidency. Considering only the agricultural population of the area under cultivation, the density is 901 in Malabar and 558 in the presidency. These figures are according to the Census Report and Tables of 1921. It may be safely asserted that the Tables of 1931 will tell a worse tale as the population of Malabar has increased without adequate increase in the area of cultivation. There is not much scope for extension of cultivation as much of the uncultivated land consists of hilly places and jungles. Besides there are certain other economic and social factors peculiar to Malabar which render the problem of employment in agriculture much more difficult of solution than elsewhere. Under such conditions the importance of cottage industries not only for subsidiary occupations but also as the sole means of employment can hardly be exaggerated.

In dealing with the subject of Cottage Industries it will be beyond the scope of this paper to deal with organised industries such as tile manufacture. In view of the fact that most of the garden lands are devoted to the cultivation of cocoanuts, coconut fibre industry is an important cottage industry engaging a fairly large number of people in the district. It is also a subsidiary occupation to those engaged in agriculture during the off-season

especially to women workers. Owing to the introduction of the dry system of cultivation which saves considerable trouble and expense and also the demand for cocoanuts which brought good price till recently, coconut planting has taken place extensively and even paddy lands have been converted into coconut gardens. The Malabar Tenants' Compensation Act also encourages extension of coconut plantation. So coconut fibre industry is one of the most expanding industries of the district, providing profitable employment to a large number of people, if properly organised. There are various processes through which the coconut husk has to pass before it is converted into coir useful for making ropes, door mats, etc. The process of extracting fibre by soaking the husk in salt water is considered to be the best as the fibre obtained is better in colour, fineness and strength than that obtained by the 'dry' process practised in areas where there are no backwaters or shallow pools. There is a good deal of loose thinking on the quality of soaked and unsoaked yarn which needs careful investigation by the Department of Industries. There is also great need to investigate and suggest better and easier methods for the conversion of husk into yarn and then into ropes, etc., so that large quantities of coir exported to foreign countries may be utilised here to prepare finished articles for sale. The question of eliminating the middle men in the various processes through which the husk passes before it is converted into coir and then into finished products, is a problem that can be tackled by co-operative effort alone. A few co-operative societies for coir workers have not been successful mainly due to the fact that the co-operative societies have not been successful in eliminating the middle men in all the processes through which the husk passes and also due to lack of facilities for marketing. Any effort made in this direction by the Government and non-officials interested in co-operative production and sale, will prove a great boon to the large number of coir workers and will ultimately place this growing industry on a sound and stable basis. The need for improving the shape, size and colour of the coconut and also the yield of coconut trees by adopting improved methods of cultivation, by the use of manures, etc., is great; and the Agricultural Department can with benefit redouble their efforts that are already being made in regard to this.

The industry next in importance is handloom weaving. Unlike other communities the Chaliyans of Malabar live and carry on their occupation in *theruvus*. To most of them weaving is the main occupation. The Chaliyans of Malabar are peculiar in many ways. They are very conservative and will not take advantage of up-to-date appliances even though they are aware that the use of such appliances would greatly improve their economic condition. They are also slow to adapt themselves to satisfy the changes in fashion, style, etc., of the consumers. On the slightest pretext such as a festival they take a holiday. Owing to their poor economic condition the weavers are generally in the clutches of middle men from whom they receive yarn and return the finished products receiving such wages as the merchants may be pleased to give them. The hold of these yarn merchants on these weavers is so strong that any movement started to better their condition will not thrive unless these middle men are also benefitted. In some cases the yarn merchants hold some important places in their caste guilds. From the experience gained in the working of two weavers' co-operative societies conducted by the "Devadhar Malabar Reconstruction Trust," I feel the problem of weavers resolves itself into these propositions:—

(a) How to tackle the question of prior indebtedness so that freed from their present shackles the weavers may be free to take advantage of the facilities offered by any movement started for their benefit such as the joint purchase and sale societies;

(b) How to provide adequate facilities for joint purchase of yarn and sale of finished products;

(c) How to increase their capacity for more production;

(d) How to improve the moral condition by weaning them from the habit of excessive drinking, avoidance of unnecessary expenses on festivals, etc., which results in debts and to save them from diseases due to unhealthy and insanitary conditions of living.

The problem almost baffles solution, in view of the fact that sufficient finance is not available to relieve the weavers from their prior debts and also to make joint purchase of yarn necessary for their work. To increase their earning capacity fly shuttle slay, warping mills, etc., should be introduced. This means large outlay of capital. When these improved appliances are introduced,

the quantity of goods produced will be larger and so ready market must be found for their finished products. So loans on easy terms are required, firstly, for clearing prior debts, secondly, for purchasing fly shuttle slays, warping mills, etc., thirdly, for keeping sufficient capital to keep the looms busy, and lastly for organising marketing of goods. The state should give these loans, if weaving as a cottage industry is to exist at all. Otherwise the prospects of weaving as a cottage industry are gloomy. There are also other conditions that sometimes make one feel that weaving cannot be successful as a cottage industry in Malabar. At the instance of dealers and middle men the weavers have adopted all kinds of devices in weaving which in good business will be put down as dishonest. In spite of the best efforts made by the Devadhar Malabar Reconstruction Trust in the two societies mentioned already, it has been found difficult to wean the weavers from these ways. Often the finished products are not equal in weight to the yarn given and also of the particular texture and kind required and of samples approved. The skill of weavers in weaving differs from one another. But the consuming public naturally demand the same variety of cloth in texture and kind. If no careful watch is kept the weavers have become so demoralised often owing to circumstances beyond their control, that either the finished products or the yarn itself is sold in the bazaar instead of returning the goods to the societies and receiving wages. A system of watch and ward has to be maintained which means lot of trouble and expense. At the same time such a system demoralises the workers. So an alternative method for carrying on weaving as an industry though not in the strict sense as a cottage industry I venture to place for consideration.

The method suggested is to run a Co-operative Weaving Factory where workmen who are all members of the society can come and work. The workers will get wages for the work turned out and at the same time bonuses. There are no evils of the sweating system, nor of the capitalistic system. All the profits go to the society and each member is paid wages according to his capacity. There will be an expert weaving master who will supervise the work and who can be paid by the society. The work will then be conducted on proper and businesslike methods. The quality of cloth produced will be better and uniform and the

quantity will be commensurate with the wages paid. The weavers are not then subject to the attention of the middle-men for they have no cloth to offer for sale. The middle men cannot grasp the finished products to the detriment of the workers. The workers also will not be able to sell finished goods for any price they get to meet their daily requirements and this one cause of their impoverishment is removed. Moreover at present weavers do not work regularly and often do not work as many hours as they ought to, not even six hours a day. They have formed indolent habits. But if they are to live at all as weavers, they should be made to work longer hours and that too regularly. A factory alone can inculcate in them all these habits.

I venture to suggest that the method suggested for weaving may, with such modifications as may be deemed necessary, be applied to coir and other industries as well, for the evils mentioned with regard to weaving are seen in a greater or lesser degree in their case also.

Another cottage industry which can be developed is the mat industry. Its success depends on the availability of raw material. This industry is specially confined to Palghat Taluk though there are other places in the district where mats are prepared out of palmyrah leaves. If a regular supply of raw material is provided and the industry is organised on a co-operative basis with facilities for marketing the industry is sure to expand. It is gratifying to learn that the Government have undertaken to organise this industry on a co-operative basis. Better methods of weaving mats by means of improved looms etc., may also be introduced to increase the output and thus better the economic condition of the workers. The Forest Department should be approached to permit free cutting of the raw material required from the neighbouring forests.

Bell-metal and bronze industry is another industry that needs encouragement. Dining dishes which are generally prepared out of bell-metal at one time found good sales outside the district. The introduction of enamel and porcelain ware has affected this industry greatly. But the utility and durability of the bell-metal wares should be impressed by means of propaganda undertaken by Government. Most of the workers engaged in

this industry are indebted to the merchants and are obliged to work for them. Organisation of this industry on a co-operative basis at least in places where the workers are sufficiently large in number is a necessity.

Besides the cottage industries already mentioned, there are cabinet making, umbrella making, soap making, fish oil manufacture, fish curing, rattan work, manufacture of knives and locks, etc., which are practised in one or other places in the district. If these industries have to thrive as they must have thrived in the past, they should all be organised on a co-operative basis. Marketing facilities should be provided by bringing to the notice of the consumer where the articles manufactured can be had by opening a Depot in a central place like Calicut or Palghat for selling the goods manufactured. Adequate finance and supervision to run these societies should be provided either by Government or the District Co-operative Banks.

At the beginning of this paper I have pointed out the special importance of cottage industries in a district like Malabar. I have tried to understand if the existing cottage industries will suffice to provide employment to all the workers whom agriculture alone cannot support. If the chronic poverty and the consequent physical deterioration is to be stopped, more cottage industries which do not involve large outlay but which will at the same time provide employment to the large number of the unemployed, should be started. Goat-rearing and poultry-farming are two cottage industries which may be usefully introduced in the district even on a large scale. Improvement in the diet of the population which has become absolutely necessary, is possible only by the use of milk and eggs as articles of food. The two cottage industries suggested will provide the necessary supply to meet the demand created by any propaganda undertaken for the improvement of diet. While the coastal towns and villages are supplied with fish, the interior places in Malabar need such articles of food as eggs and milk to take the place of fish.

In conclusion permit me to impress again the importance of cottage industries in Malabar if the growing population is to live at all under improved conditions of living. As agriculture can no longer provide occupation for all the workers, unless cottage

industries are well organised and run on proper lines, the economic future of Malabar is bound to be gloomy and no one interested in Malabar can ponder over it with equanimity realising what economic discontent would lead to elsewhere and more so in Malabar.

The Urban Geography of Malabar

By Mr. R. Dann, Director of Town-Planning, Madras.

The climatic conditions prevalent on the western side of the Indian Peninsula have been largely responsible for a class of urban development which is peculiar to that side and in great contrast to that of the east side and centre of the Peninsula.

The heavy rainfall, rather than the severe sun-heat, has been the dominant factor in setting the architectural character of buildings and the open character of the towns in which, to a large extent, the open garden or compound has been preserved around the house.

It would be an interesting study to analyse the factors that have dominated development and produced the Garden Cities of the West Coast. The cocoanut and other palms must I think be given pride of place in this respect. The high pitched thatch roof kept in good repair, has required a continuous supply of leaves for thatching. The copra and coir and other industries have developed from the palm and so the tree has entered very intimately into the life and commerce of the people. The compound each with its palm trees has been preserved as an integral and necessary part of the establishment.

Excessive rainfall is itself a strong argument for the open compound which insures a more rapid disposal of water. In a closely built up town there would be much greater danger of flooding in the streets as most of the water is discharged immediately from the houses and yards into the streets.

In one most important respect the West Coast town is not a Garden City, and that is in its lack of roads. In the planned Garden City, as well as the ordinary city, every house or property has direct access to a public roadway, (This statement is only partially true with respect to Indian Cities) but in the West Coast towns large areas are entirely without road access, the only means of approach to many properties being the narrow gullies which in monsoon times become torrents of storm water. This condition, which is not unbearable in the country or village,

creates great difficulties in the more complicated existence of the town where other methods of locomotion than pedestrianism enter more and more into the lives of the people. Moreover the road is required for other purposes than communication as they are the arteries along which flow the life blood of the City, the water mains, the sewers, the gas mains, the electric telegraph and telephone cables or wires.

Now that these things are entering more and more into city life this absence of roads is a very serious problem. Town Planning schemes in West Coast towns are concerned more with the provision of roads and lanes for the use of existing population than with the question of town extension.

This is a much more difficult and costly problem; for, as a general rule, although the roads are demanded by the people the latter are seldom ready to co-operate with the local authority by giving land for the roads. They fail to see that by surrendering say 10% of their land, the 90% that remains will be worth more than the original plot and they themselves will be doubly benefited, having a more valuable property and having a convenient access.

There is another peculiar characteristic of West Coast towns. Along the coastal tract population is continuous wherever coconuts grow or land is cultivable. The only difference between town and country is a greater concentration of population at and near the bazaar and the boundaries have to be more definitely related to physical features than to limits of population.

It will be found frequently that population is thicker just outside than just inside municipal limits. This can be seen at Calicut, Tellicherry, Mangalore, etc. There would appear to be a pressing need for adjustment of boundaries. This matter appears to be considered, frequently, from the wrong basis, that of finance. Boundaries should extend automatically before the building up of an area so that the control which is exercised within should apply to the whole, and slums are not allowed to develop in the suburb. Unfortunately in this respect control within municipal limits is often so lax that slums and insanitary areas are continually growing up inside and extension might not therefore make much difference. In theory however, if not in practice, extension of

boundaries should precede and not follow the spread of population. But this theory must necessarily be modified where population continues indefinitely and physical factors rule the situation.

Whilst we have a distinct type of town in Malabar and on the West Coast we have also a distinct type of house whilst Temples and Mosques differ so materially from those on the East as to be a surprise even to members of the communities concerned who do not live on the West Side. In all, houses, temples and mosques, the fairly steep tile roof with wide overhanging eaves designed to throw off the rain, is the dominant feature rather than the flat terrace roof of the east. The picturesque tilting of the ridge and eaves (following roughly the lines of a tent) in some parts is reminiscent of Chinese architecture but the style is so eminently suitable to climatic conditions that there seems no reason to doubt its local evolution through the centuries.

This roof with its projecting lattice windows just below the eaves and its gables at the ridge provides for good ventilation without letting in the rain. Moreover the ladies of the house can sit in purdah within and see all that is passing in the street below.

A natural concomitant of a wet climate is forest and heavy timber; and this also has rightly affected architecture, timber entering very much more largely into construction than on the east.

The houses generally are built under one large unbroken roof; the internal courtyard which might give much trouble in a very wet climate is not common.

It is most unfortunate when towns lose their distinctive characteristics by becoming cosmopolitan architecturally, foreign in style and material. Because of the need for a good sound roof for protection the West has not suffered as much as the East in this respect; but some of the modern buildings where tradition has been overthrown are not only ugly but they are less efficient.

Malabar including British Cochin has 5 towns of municipal status, Calicut, Palghat, Cannanore, Tellicherry and Cochin. I can say nothing of the other towns as I have not visited them. Guntur, Tanjore and Coimbatore with six municipalities each are the only other Districts with as many Municipalities as Malabar.

Of these *Calicut* is the largest with about one lakh of population, a 20·4% increase over 1921. Calicut to my mind has unreasonable shape. A large area to the South-east which, for all the benefit it gets might as well be outside of municipal limits, is included whilst a thickly populated area to the East which is much nearer the centre of the town is excluded. If this latter area were to be included the population of Calicut would be well over the lakh that it now just fails to reach. Of the towns of Malabar, Calicut is the least interesting in its situation having no pronounced topographical reason for its existence, which appears to be fortuitous, and one must look elsewhere for its *raison d'être*. This is no doubt due to its early trading history and as the headquarters of the Zamorin.

Calicut covers 10·77 sq. miles *i.e.* 6 miles long north to south and only 1½ miles wide in the centre but extends to three miles at the north and near the south.

Its commercial and trading centre is naturally along the shore and Kallayi river, whilst it has an administrative centre about ¾ of a mile inland near the Mananchira tank and a Cantonment at its northern limits.

Its road mileage is 76 or about 7 per sq. mile compared with about 14 in Madras city. Except for the West Hill on which the Cantonment is situated it is practically flat and it is divided by the river Kallayi, a short stream of no importance. Calicut like Masulipatam has a small French property in the centre of the town, but which is connected by canal with the Beypore and other rivers which bring down timber from the forestal tracks in the hinterland.

Cochin.—Although Cochin is the smallest of the Municipalities I am placing it second, as its importance is out of proportion to its size and population. Its area is only about a sq. mile whilst its population increased from 20637 in 1921 to 22594 in 1931 or 9·5% only. This must be due largely to the fact that it is restricted in area and Cochin itself is only one of several Governmental units which make up the agglomeration of population round the harbour where the waters of the Periyar and other rivers discharge into the sea. Mattancheri during the decade has increased from 24664 to 39652 or by 60·7% and if Ernakulam

Vendurthi, Bolghotti and other places round the mouth of the harbour are included, I believe the population would be considerably in excess of that of Calicut. Cochin, with the finest natural harbour in the Peninsula, recently open to ocean going vessels has a big future before it. This harbour is a logical reason for the location of the town, in fact it would be very surprising if a town had not been established there.

Cochin with Mattancheri is one of the most picturesque towns in South India. It is full of fascinating street pictures. Its small trim green maidans and red latterite roads, its quaint and beautiful buildings, its curious Chinese fishing nets, its pervading air of quiet calm, are most attractive.

Unfortunately the motor car has recently invaded the town and the quiet roads, hitherto knowing only pedestrians and rubber tyred rickshaws, may soon be undistinguishable from those of any ordinary town, whilst one or two of its buildings have already been disfigured by the huge and splashy hoardings which appear strangely indispensable to the motor trade. I cannot imagine that they will affect the sale of cars in the slightest! I am sure that the respectable firms which turn out the modern motor car, in itself one of the most beautiful of the factory products of man, would be aghast at some of the vandalisms that are perpetrated by their agents in the beauty spots of the World. It is a pity that Cochin, like Venice, could not be preserved from the noisy hootings and pervading dust and disorder of motor traffic. Its roads both in width and character are not designed for fast motor traffic. The quiet canals of Venice are likewise being invaded by motor boats with unaccustomed speed and noise with disquieting results to foundations of buildings which have stood for centuries.

Cochin is noted for its Jewish communities, white and black, said to have settled there in the 1st year of the Christian Era, whilst St. Thomas is said to have lived and worked there in 52 A.D. and originated the Christian community there. To-day over 50% of its population is nominally Christian. Cochin may soon become a port of call for some of the great passenger lines, and visitors from other parts of the world will be introduced to its charms. Will it be possible under such conditions to preserve its mediaeval dignity and charm? It is to be hoped that in its own, even material interests, it will attempt to do so.

Tellicherry vies with Cochin in its claims to the picturesque. In Cochin this is due to the Backwater, its quaint shipping and its islands and to its beautiful buildings and street pictures. Tellicherry owes its beauty very largely to the nature of its foreshore, its rocky promontories and little sandy bays, whilst the terrain is steeply undulating, whereas Cochin is quite flat. It is a delightful spot, one of the few places on the coast, I believe, where the monotony of a palm-lined sandy foreshore is broken and the rocks go out to meet the sea. On the north the town is bounded by the Tellicherry river, picturesquely winding amongst the low hills. The river Eta Kadava further to the north has just been bridged, and a bridge is under construction over the Mahe river a little to the south of the town.

The population of Tellicherry was 27,576 at the last census, having been practically stationary for about 40 years but it has shown a considerable increase this year.

Cannanore is also picturesquely situated on the coast, which here also is broken with a rocky promontory on which the old Fort is situated. It is only a dozen miles north of Tellicherry and it is somewhat surprising to find two large towns so close together. Though not so picturesque as Tellicherry it can boast an open maidan such as no other town possesses in Malabar, or elsewhere on the coast, a fine wide open space of grass which is of great direct and indirect value to the community and should be most carefully cherished. Cannanore had a population of 27,708 almost exactly the same as Tellicherry; it also has been stationary during the previous 40 years. In 1871 it had a population of over 31,000, but has increased to about 36,000 to this year.

All these towns, and I think particularly Cannanore, have, unfortunately, areas which are inclined to become congested. It would be most desirable if some attempts could be made, under the wider powers given under the Amended Town Planning Act, to place a building or population limit on areas that are becoming over-crowded. In view of the manifest advantages of the open system of development both to the town and the community this would be a reasonable though perhaps not an easy thing to do.

Lastly we come to **Palghat**. Palghat had a population of 45,487 in 1921, and has increased to about 48,500 this year.

Palghat is neither truly West nor truly East—it partakes of the natures of both appropriately, being situated in the centre of the gateway or pass between the two sides of the peninsula on the main traffic route. Palghat is unique; there is no other town quite like it.

Like the Levi in the Biblical story of the Good Samaritan the old Madras Railway, in its well-known exclusive manner, passed it by on the other side and therefore even to-day Palghat is still somewhat off the beaten track leading its own life little influenced by the outside world. Soon it will have a new connection by Railway to Pollachi, and the junction at Olavakote until the meter gauge line is extended further west will be an interchange station between meter and broad gauge. May Palghat, in spite of its new publicity (and may we hope prosperity) preserve its individuality or whatever is charming and worth preserving in its individuality, for I would not go so far as to say that it has an unblemished escutcheon geographically or administratively!

There are some things about Palghat which may well be taken as a model by other towns, some features that are peculiarly suited to climate and custom. It has in most parts neighbourliness without congestion; its houses may be closely built along the road but they have large open spaces in their rear. The houses being close together, the road length per house is small, an important matter from the point of view of municipal service. The open fields coming right up to the backs of the house ensure good ventilation and are convenient for sanitation on the village model! Palghat is in effect a collection of villages, each village surrounded by open fields.

In another respect, we can learn from Palghat, *viz.*, "Urbanity" in architecture. Here we find harmony, each house a compliment to its neighbour. In some modern developments in other towns we find each house a discordant note in a profusion of ugliness. This unfortunately can best be seen in some building schemes of Co-operative Building Society's where if anywhere concord should prevail.

Good manners in architecture, as amongst persons does not consist in blatantly calling attention to oneself and one's attire but rather the reverse; some of the simplest and most unassuming

buildings and persons convey the impression of good breeding and good style much more satisfactorily than those that are covered with meretricious and shoddy plaster ornamentation. Moreover, the simple straightforward building is going to look good when the self-conscious attempts at decoration on its expensive neighbours has fallen into ruin.

Some Aspects of the Geography of Calicut

By Mr. N. Subrahmanyam, M.A., L.T., F.R.G.S.

Town and its Environs : Position and boundary.—Calicut is the capital of Malabar, the fourth city and one of the principal ports in the Madras Presidency. Besides being a municipality, it is a cantonment, and the headquarters of all branches of administration in the district.

The situation of Calicut is low, flat and unhealthy. The District Gazetteer records that "its position on the little Kallayi river is a standing puzzle"; for, six miles further south there is a better site at the mouth of the "Beypore river" which appears to be marked out by Nature for a great town, and it is recorded that the attempts made both by Tippu Sultan and the Madras Railway Company later to induce the inhabitants to move to that site ended in failure.

Geographically the position of Calicut may be considered under four heads: its world position, its coastal position, its situation on the Kallayi river, and its central position in the district itself.

Its latitude 11.15° N. and longitude 75.45° E. fix its position on the globe. Its coastal position on the western sea-board of Southern India has given it its importance as a port for the hinterland of the Wynaad, rich in coffee, pepper and tea. But, there is no deep water close ashore, and therefore, there is no harbour worth the name, and steamers have to lie in the open roadstead, two miles off the land. Shipping facilities have been increased by a small iron screw-pile pier; and the light-house built in 1847 has lately been replaced by a more modern structure. Government has decided that nothing further can be done for the port at any cost proportionate to its trade. Nevertheless, the trade of Calicut is considerable, amounting to nearly 2 crores of rupees—Cochin further south has, however, decidedly superior natural advantages for a great harbour, and the scheme now in progress there will have its reaction on the trade of Calicut.

The situation of Calicut on the Kallayi river has been the deciding factor in making the town one of the important timber emporiums in India. Kallayi is linked with the Elattur river in the north and the Beypore river in the south by the Conolly Canal. The latter river which taps the forests of the Nilambur valley and the adjacent hills is the main artery of the timber traffic. Vast quantities of timber are floated down through the Conolly Canal to Kallayi, close to the Calicut Bazaar, one of the greatest timber marts of India.

The sea-board of Malabar from north-north-west to south-south-east is approximately 150 miles, and Calicut being more or less at the centre is eminently fitted to occupy the position of the premier town in the district.

General description.—The town is spread over an area of 13 square miles, with an average breadth of about two miles, and stretches along the shore for some six miles from the southern boundary of the Panniyankara Desom to the West Hill Barracks.

The approach to the town from the south and north is mainly by rail—the S. I. R. having been connected to Calicut from Beypore in 1889; and in 1901 it was extended from Calicut to Badagara in the north. There are also good roads, which converge in the town; of these, the chief are the Beypore Coast Road from the south, the Cannanore Coast Road from the north, and the Wynaad Road from the east.

The traveller approaching the town by any of these roads will pass through “elegant avenues” as Dr. Buchanan called them, jacks, mangoes, and banyans being the trees commonly found. In the town itself, the traveller will find large stretches of cultivation and comparatively few streets, many parts of the town like Chalapuram being, strictly speaking, more rural than urban in character. This is in keeping with the rest of this region, whose general nature is well described by the Gazetteer as follows:—“Beneath the shade of the trees nestle the houses of the natives, not huddled together as in an east coast village, but each in its own compound, surrounded by a stout thorn fence and full of giant plantains with their broad leaves.”

The Mananchira tank and maidan form the centre of the city. Round them cluster the offices of the Collector and the District Superintendent of Police, the Imperial Bank, the Municipal Hospital, the District Registrar's Office and the Jubilee Town Hall. Close at hand are the District Court and the main Railway Station, and on the south-east lie the fashionable Hindu quarters of Chalapuram and Talli. The ware-houses and offices of the mercantile community fringe the shore from the Malabar Club to the Kallayi River. The railway line is cut across at many places by roads from the eastern quarters—notably the Varakkal Road, and the Bazaar Road.

Slope and streams.—The general slope of the place is towards the sea in the west, except in the southern part where the land on either side slopes towards the river Kallayi.

It is the only stream of importance here. Its importance to the timber trade has already been alluded to. In the proper season the river at Kallayi is a wonderful sight, the water being scarcely visible for the thousands of logs floating on its surface. The logs are left in the water until they are sold, and eventually are exported by sea and rail to Bombay, Madras, Kolar and other parts of India.

Flora.—The graceful cocoanut palm (*Cocos nucifera*) is the characteristic tree here as elsewhere on the Malabar coast; but jack (*Artocarpus integrifolia*), mango (*Mangifera Indica*), cashew nut (*Anacardium occidentale*), the talipot palm (*Corypha umbra-culifera*), the areca (*Areca catechu*), the casuarina (*Casuarina equisetifolia*), and other trees are common. Many familiar trees in this region are exotics in Malabar. In gardens the plantain (*Musa paradisiaca*) thrives luxuriantly; and wild arrowroot (*Curcuma Angustifolia*), Calladiums, yams and other vegetables grow plentifully. Flowering trees are a conspicuous feature of the flora in this region. The alamander and the hibiscus are the commonest garden flowers, as also zinnass, balsams, cannas and Eucharis lilies, which grow luxuriantly.

Temperature.—Systematic meteorological observations are made here daily at 8 A. M. The following statement gives the

average maxima, minima, and mean temperatures in degrees Fahrenheit :—

Temperature.

Months.	Normal Maximum.	Normal Minimum.	Mean.
January	87.6	69.6	78.6
February	88.7	72.6	80.7
March	90.3	76.1	83.2
April	91.3	77.9	84.6
May	90.4	77.9	84.1
June	84.6	74.7	79.7
July	82.5	73.9	78.2
August	82.8	74.1	78.4
September	84.3	74.4	79.3
October	86.2	74.5	80.4
November	87.4	73.1	80.2
December	87.6	70.5	79.1
Annual	86.9	74.1	80.5

The striking feature of these statistics is the extraordinary uniformity of the temperature, great extremes of heat and cold being unknown. In the hottest months the average maximum is only 91.3° (April), and minimum 69.6° (January). In this respect it differs but slightly from that of Cochin further south, the respective figures being 91.5° and 71.5°. The greatest range of mean temperature is only 6.4°, being the difference between 84.6° (April), and 78.2° (January).

Humidity.—The temperature figures by themselves leave the impression of an exhilarating climate, and might well be so if the town was situated in a dry region. The relatively high percentage of humidity makes the climate rather oppressive. The following table gives the figures for the town monthwar.

Humidity.

Months	Humidity.
January	... 78
February	... 79
March	... 76

Humidity—Contd.

Months.	Humidity.
April	... 77
May	... 79
June	... 89
July	... 92
August	... 91
September	... 89
October	... 86
November	... 82
December	... 78
Average	... 83

As is natural to a region exposed to the full face of the south-west monsoon, the average percentage of humidity in the atmosphere (83) is exceptionally high. It rises to 89, 92 and 91 in June, July and August respectively when the monsoon prevails, and sinks to 76 in March when the average rainfall is less than one inch.

The resulting climate has been well described in the District Gazetteer as follows :—

“ In the hottest months the average maximum temperature is only 91°, but though at first sight this compares favourably with the 103° of Bellary, it is oppressive enough in the moisture-laden atmosphere of Malabar to make life a burden. In the monsoon when the sun is obscured by clouds and the landscape blotted out in the rain, the diurnal range of the thermometer is very limited ; but the air is damp and chilly rather than cold, and even in the nights of the so-called cold weather, the thermometer rarely sinks below 70°. The net result is a climate which though not unhealthy cannot be called exhilarating ”.

Rainfall.—The average annual rainfall for 40 years from 1870 to 1909 was 118.84 inches. During the 16 years (1910-1926), however, the mean annual rainfall appears to have slightly

increased to 125", the actual figures of course varying from year to year. The following table gives the average rainfall in inches monthwar :—

Monthly average rainfall.		
January	...	0.5
February	...	0.15
March	...	0.75
April	...	2.25
May	...	9.5
June	...	32.75
July	...	33.0
August	...	19.0
September	...	8.5
October	...	10.0
November	...	7.35
December	...	1.2
Total		125.0

The figures are interesting, as showing the annual cycle of seasons. January, February and March are the dry months, when burning land winds blow and the heat is tempered only by the cool evening breeze from the sea. Early in April, the first distant mutterings of thunder are heard on the Ghats, and towards the end of May the blue-black clouds gathering in the south-west herald the onset of the monsoon. In this season the roll of thunder is sometimes continuous for minutes together and the blaze of lightning incessant. With the burst of the monsoon, generally about the second week of June, the thunder-storms cease, the flood-gates of heaven are opened, and the clouds descend in rain. In August the rains slacken, and at the end of September the south-west monsoon has run its course, having given more than three-fourths of the annual rainfall of the town. Land winds assert themselves once more; the winter monsoon brings some showers in October and November, and by the end of December dry weather usually sets in.

A comparison with Palghat, the second town in the district during the monsoon months is interesting:—

Months.		Palghat.	Calicut.
June	...	16.77"	35.32"
July	...	21.2"	30.83"
August	...	12.13"	15.53"
September	...	5.98"	6.07"
Total		56.08"	89.75"
Annual		78.38"	116.69"

Prevailing Winds.—In January, February and March, we have the dry land winds from the east. In May the violence of the winds is particularly noticeable, and sometimes there are storms.

The curious persistence with which the wind blows from the north and north-west in the months of the so-called south-west monsoon is noticeable. "The explanation is that the monsoon current which approaches the peninsula of India from an almost due westerly direction there encounters an elevated land surface, the trend of which is towards the south-south-east, and though a considerable portion surmounts the Ghats, and enters India, yet a large part of the surface air is deflected southwards and becomes a north-westerly wind," *Quoted in the Gazetteer from "The Winds and Monsoons of the Arabian Sea and Indian Ocean." by W. L. Wallas.*)

Floods and Storms.—Excessive falls of rain are common, and floods fairly frequent. On the 19th and 20th May 1882 between 18 and 22 inches of rain fell in 24 hours in different parts of Calicut! and in the monsoon of 1871 the rain gauge at the Collector's Office registered over six inches a day for six consecutive days. During every monsoon, the river overflows its banks, and there were particularly high floods in 1902, 1907 and 1924.

The squalls that usher in the south-west monsoon are often terrific in their violence, and are responsible for the loss of several *pattamars*, that have lingered too long on this inhospitable

coast. But Malabar is protected from the devastating cyclones that periodically visit the Coromandel Coast by the sheltering Ghats; and great storms are rare. The great hurricane of April 1848, whose disastrous effects were felt from Cannanore to Chettuvayi, left its mark on Calicut also. (*From a Chapter on the Civic Survey of Calicut Municipality, prepared by the author.*)

Public Health of Malabar in Relation to Environment

By Major A. M. V. Hesteriow, I. M. S.

On account of its position on the West Coast behind the Western Ghats, Malabar, in common with the other West Coast District of S. Kanara, offers problems in Public Health quite different from those found in the rest of the Presidency. As a general rule, owing to its isolated position, it is virtually free from the danger of epidemics spreading to it from the neighbouring districts; and contrariwise, infections do not travel from it to other districts. It may, therefore, be considered to be self-contained in this matter, infections arising in the district and remaining more or less localised and not spreading extensively as in many other districts. This isolation however does not seem to have made the people more susceptible to infection as is usually the case in isolated communities, and this is probably because of the absence of crowding into towns, for not only is the district self-contained, but the family and household also may be held to be similarly isolated and self-contained.

There are to all intents and purposes no real towns or villages. Such few towns as there are being merely collections of bazaars or trading stations; and even these towns consist very largely of isolated houses in more or less extensive grounds of their own. There are no rows of houses in streets and therefore there is no congestion of population due to this cause. The population is thus more uniformly distributed than in other districts. The abundant rains and the fertility of the soil produce a more satisfactory economic condition generally than probably is the case anywhere else in the Presidency. The problem therefore seems to be one more of Hygiene (personal sanitation) than of Public Health (State Sanitation). Owing to the scattered nature of the dwelling houses, the difficulties of the local sanitary authorities in regard to the provision of safe and protected water supplies, collection, removal and disposal of rubbish, and in regard to conservancy and scavenging are very great. The long distances,

that have to be covered in most cases render the cost of these services prohibitive, notwithstanding the generally satisfactory economic condition. The environmental conditions therefore impose a very serious obstacle to the institution of public health measures.

The routes of access to Malabar from the Presidency are very restricted, being mainly two, *viz.*, (i) the Palghat Gap, which is the main entrance and really the only entrance, (ii) the road *via* Gudalur through the Wynaad, but this route being through the Nilgiris is of very minor importance. Thus it is only the southern portion of Malabar that is in more or less free communication with the Presidency. The northern portion of Malabar is only in communication with the Presidency through the South. The North is in free communication with the States of Mysore and Coorg.

This characteristic of the communications has an important bearing on the occurrence and spread of epidemics of infectious disease. Cholera for example, when imported, comes in from Coimbatore which as a rule does not suffer badly; consequently the epidemics are not extensive, and are more or less restricted to Palghat and Walluvanad Taluqs. This is also due to the fact that Cholera in Malabar is more often spread by contact than by infected water supplies, as each house is self-contained and has its own water supply; and for some reason, although there are numerous rivers the people do not resort to them for their drinking water, as they do in other districts, and so avoid much of the danger of cholera water borne infection. At the present time plague is more readily introduced from Mysore than from the South. Small-pox is widely prevalent in the District with a high incidence and mortality rate, and severe epidemics are not uncommon. This state of affairs in an easily preventible disease is attributable mainly to the environment, which makes it difficult to trace and to vaccinate susceptible persons. It is easier to ensure efficiency of vaccination in towns where the population is readily accessible, than in the amsoms and Desoms of Malabar, where the individual houses are widely separated from one another, and where there is more privacy and seclusion. Further the presence of a large Moplah population adds to the difficulties, as it always does where the Mahommedan Gosha system prevails to any

extent. It will therefore be found that a low incidence of Small-pox has been proceeded by a severe epidemic, which has reduced the number of susceptibles. For these reasons Malabar has one of the highest Small-pox death rates in the Presidency.

Fevers, as in many other districts having similar characteristics of mountain and jungle, cause the highest mortality from a single cause. Of these fevers the commonest is undoubtedly malaria, as has been found wherever an investigation has been made. In practically every Taluq there are environmental conditions very favourable for the disease, *viz.*, foot-hills of the ghats with an abundance of jungle and stream. The rainfall is large and in these foot-hill areas, the drainage is defective. The level of the sub-soil water is high, resulting in marsh and bog, seepages, and winding streams, with erosions of their beds and banks. These with the cover afforded by the jungle make ideal conditions for the development and growth of the malaria mosquitos. On account of the extent of these favourable mosquito environments, it makes the question of dealing with them efficiently very costly and difficult. It is one of those situations where the only efficient agency is the state. Efforts are being made to deal with the most badly infected localities by palliative measures, the most important and useful of which is the widespread free distribution of quinine in these localities. There can be no doubt that although this will not combat the mosquito danger, it will go a very long way in reducing the mass of infection in the individual, who will then be more inclined to undertake more permanent measures of amelioration with some hope of success. In this matter teachers can be of direct use, as in the rural areas they are one of the accredited agents for the distribution of free quinine in their villages and it is necessary that they should be aware of the importance of their active co-operation.

Another large field, in which the environmental conditions in Malabar have very important effect, is that of general sanitation. It is in this above all others that the individual can do very much to help without much trouble. The extent to which the general sanitation is defective may be judged by the fact that practically the whole population is infected with hookworm, by the fact that dysentery and diarrhoea mortality is one of the highest in the Presidency, often the highest, and by the fact that enteric

fever is probably more often reported from this district than from elsewhere. The abundant rainfall, the high subsoil water and high average temperature, help to bring about this state of affairs. As each house has its own compound and an extensive garden, the houses are self-contained also in regard to their rubbish wastes. These rubbish and waste are thus accumulated on the premises and bring about a state of insanitation which eventuates in the incidence and spread of infections including pollution of the soil by faeces, and contamination of the wells. To bring about an improvement in these conditions a rural sanitation unit is engaged in the district. This unit is endeavouring to prevent soil-pollution by educating and inducing the people to provide themselves with bore-hole latrines, which are self-acting, economical, and practically ever-lasting, requiring the minimum of attention which every reasonable user can afford. Here also teachers can help very much by precept and example. District Health Officers and Rural Sanitation Units where they exist will be only too pleased to give teachers the necessary advice and help to popularise the use of these simple latrines, and thus to inculcate habits of cleanliness and thoughtfulness of others.

On account of the generally rocky nature of the soil, the laterite rock being either on the surface or very close beneath in many places, disposal of night soil wastes by the method of trenching is rendered very difficult. In some places, as in the coastal municipalities, it is impossible to trench night soil effectively on this account. This naturally creates a considerable nuisance and constitutes a danger to public health. Many attempts have been made to overcome this nuisance but hitherto without success, and now it would seem that the solution of the difficulty will lie in the adaptation of some form of septic tank to the peculiar conditions of these places. An investigation has been started on this matter and it is hoped a practical solution of the difficulty will emerge therefrom. Considerable help in meeting this difficulty will be afforded if the use of bore hole latrines becomes more universal and there seems to be grounds for thinking that such latrines are becoming popular, and teachers in their schools can give much help in speeding up the process. In this connection it may be of interest to know that the water of the wells in the compounds of houses will not be endangered if

the bore holes are placed more than 25-50 ft. from the well and precautions are taken with regard to the direction of flow of the ground water. These points also are under investigation and it is hoped that useful practical results will be obtained which can be handed on to the general public.

In the coastal villages in the South and in the region of the backwaters filaria infection prevails. This is a continuation of the filaria environment northwards from Cochin. In connection with this region also it is of historic interest to note that Hutchinson declared that leprosy was in some way caused or predisposed to, by the eating of fish, especially salted fish. This view is no longer held and at present we have not enough data to warrant a statement incriminating one region or cause more than another.

The average of respiratory diseases is greater in Malabar than in other districts. This is probably due to the high humidity of the atmosphere more or less throughout the year and to the abundance of the rainfall, producing conditions favourable to the incidence of respiratory diseases. A very dangerous form of respiratory disease—pneumonic plague—has been reported on several occasions in Calicut and Mangalore, the infection being derived from the Nilgiris, but with the general decline of plague this infection of the respiratory tract has also passed.

Finally Public Health work is adversely affected by the environments of Malabar. Communication is not easy, except for the railway along the coast and along a few main roads during the short comparatively non-rainy season. During the rains, which extend to about 9 months in the year communications are difficult and it is in this season that public health is likely to deteriorate owing to the prevalence of favourable predisposing conditions. Consequently the registration and check of vital statistics, and the carrying out of preventive measures is very greatly hindered. It is for this reason that active co-operation is required from the people themselves who generally live in conditions where their individual effort can go a long way to elevate the standard of public health in the district.

A Note on Transport and Communications in Malabar

By Mr. N. Subrahmanaym, M. A., L. T., F. R. G. S.

Compared to the East Coast Districts, Malabar like Cochin and Travancore to the south of it, is peculiar in possessing navigable waterways due to the geographical conditions of the land. The chief rivers that flow down the Western Ghats run across the plains to the coast where their natural outlets to the sea are obstructed by sand bars and banks. They consequently discharge their large volume of water into backwaters which run parallel with the shore.

These backwaters formed the only important channel of trade before the days of Tippu Sultan, affording north-to-south line of communication, safe for boat traffic even at the height of the monsoon. Canals dug mostly about the middle of the 19th century linked up these natural waterways, so that there is now an inland water communication almost continuously from the northern end of the district to Trivandrum. The scenery alongside of them is one of unique beauty, lined as they are by a luxuriant growth of cocoanut plantations, interspersed with a variety of other trees besides.

These inland waterways were of very great use to the foreign traders who visited the country at various epochs for the sake of its valuable spices. The Mapilla settlements along the riverbanks and the river-mouths and the factories of the early European traders—the Portuguese, the Dutch, the French and the English—testify to their high commercial importance. Even at the present day they are largely used for floating down the timber of the highland forests and for the carriage of heavy and bulky articles such as laterite, tiles, cocoanut products, etc.

In recent times, however, the railway has reduced the importance of their goods traffic, as the roads especially after the advent of the automobile have taken away their small passenger traffic, except at the ferries at the unbridged sections of the roads.

The roads of Malabar, unlike those of several East Coast Districts, are comparatively of recent construction, the earliest of

them dating only from the days of Tippu, though most of them fell into ruins after his time. Ibn Batuta in the fourteenth century refers to the absence of beasts of burden in Malabar and to the use of human transport for the carriage of merchandise. Tippu's hastily improvised gun-roads, which ran from Mysore through Coimbatore and Palghat Gap as well as through the passes in Wynaad to his capital in Malabar at Feroke, quickly fell to ruins after his days, thanks to the hilly nature of the country and the heavy rainfall. They continued to be in a state of neglect until about the middle of the nineteenth century when a regular policy of road construction was adopted. Since then there has been a vast extension of roads which have since grown steadily more important.

The Waliyar-Ponnani road was for some years the main highway of communication between the East Coast Districts and Malabar; but the construction of the railway from Madras to Beypore brought down its importance, as its extension to Mangalore reduced the value of the coast road from Calicut to Cannanore. With the exception of the two great high roads of trade that connect the planting areas of Coorg and Wynaad with Tellicherry and Calicut respectively and through which are conveyed heavy loads of coffee, pepper and timber as well as some tea, the other roads of Malabar have been serving only as feeders of railways.

There is at present in the district nearly 2,000 miles of roads, which form a net work linking up the various parts of it together. But their maintenance presents difficulties peculiar to the West Coast region. The undulating nature of the country and the heavy monsoon rains are responsible for the great havoc done to the roads so that in spite of heavy expenditure of the local boards under this item, it is found hard to maintain them in a fit condition throughout the year or for any very long period. The roads of Coimbatore, Salem and Chittoor, where again with much less rainfall hard gritty road metal is readily available, afford a striking contrast in this respect.

It is necessary, however, to emphasize here the recent rise of the roads again to greater importance in Malabar as elsewhere with the advent of the motor traffic. Though the use of lorries for goods traffic outside the towns has not yet become so general

in our country as in the West, bus traffic has become quite common, affording a cheap and quick transport to every nook and corner of the district. It is interesting to note the economic, social and cultural reactions of this new transport. Adjustments to this new mode of conveyance are taking place though inadequately, as is evidenced in the widening of the trunk-road from Madras to Calicut even at the sacrifice of the gigantic century-old avenue trees—jacks, mangoes, and banyans—that line it on either side. Other adaptations to new conditions such as tarring the roads and using more gritty material have not been adopted generally even in the towns.

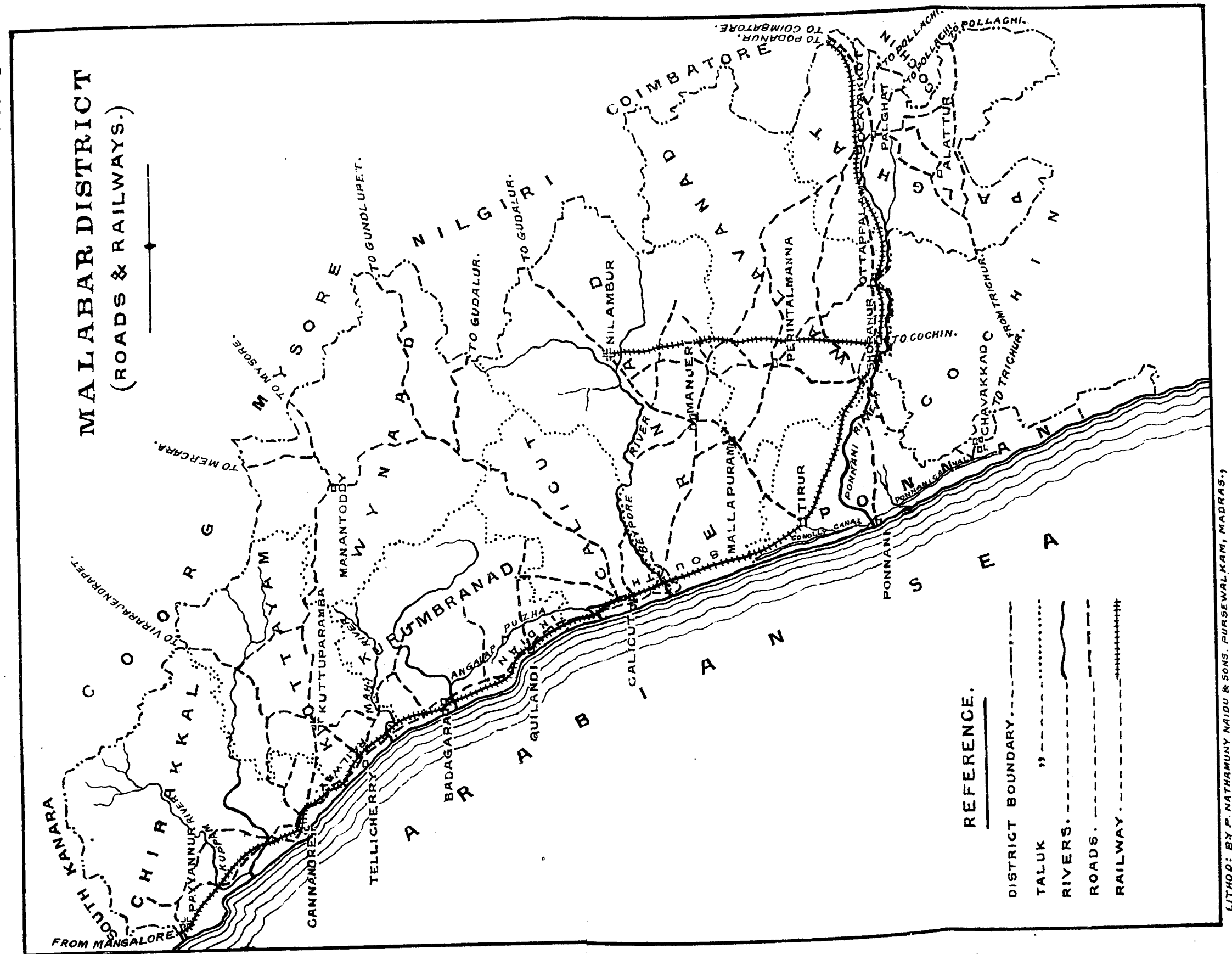
Unbridged sections of the roads cross the waterways at ferries where railed platforms (jangadams) attached to dug-outs tied together serve for the carriage of carts and horses.

The South Indian Railway (Standard guage) runs westwards from Waliyar at the head of the Palghat Gap down the Ponnani valley along the course of that river up to Edakkulam, and then turning north runs parallel to the coast from Tirur to Mangalore keeping more or less close to it. The branch line from Olavakkot to Palghat (3 miles) is now being continued to Pollachi in the Coimbatore District in order to give the West Coast direct access with the south-eastern districts of the Presidency and to develop the timber trade of Palghat.

In view of the Cochin harbour scheme, new developments in railway construction are rapidly taking place. For example, the Shoranur-Ernakulam line of the Cochin State Railway is being widened to standard guage, while from Kollengode on the new Palghat-Pollachi line a metre guage connection to Trichur is projected. The Shoranur-Nilambur line, constructed for political purposes, serves also the timber trade of the famous forests of Nilambur Valley. Much of the interior of the district, however, still remains untapped by railways.

While the railway and the road are getting more or less adjusted to modern needs and requirements, it is interesting to surmise whether the waterways of the district will come into greater use as feeders of the Cochin Harbour trade.

FIG. 8.



The Relation between Malabar and the Tamils

By Rao Saheb C. M. Ramachandra Chettiyar, B.A., B.L.

The country where Malayalam is spoken is a strip of land between the Western Ghats and the sea and from Payyanur to Trivandrum. In physical features it differs considerably from the Eastern plains and consequently it has developed a characteristic feature among its people which appears to be quite in contrast to that of the inhabitants of the eastern plains. The climatic differences have accelerated the differences in the character of the peoples. Though in the days of yore, the same kind of people inhabited the East as well as the West, the insulation and the separation had grown to a considerable extent owing to want of communications, due to the growth of impenetrable forests in the passages along the ghats which connected the two tracts. Even to-day a student of Coimbatore prefers rather to go to Madras to continue his B.A. course at a distance of 300 miles than to go to Palghat which is only 30 miles towards the West. Trans-Valayar seems to be a hob-goblin to many a youngster owing to the uncompromising manners and customs of the people and the threatening out-pour of rains and the scorching sun on the undulating grounds on that side of the ghats.

One is tempted to ask what is the cause for such an insulation in character and separation in tendency which is manifesting in this peculiar country. Was it always of the same feature from the earliest days? To our utter surprise we find that often there had been communications in matters political, social, religious and commercial between the West and the East and in early days both parts of the country was one and the same, speaking only one language, Tamil. But the conservatism of the people of the western strip which is the result of its physical features, retained in its people all the old-time and time-honoured customs and gave them a remarkable character which began to appear in contrast more and more, as the eastern altered its character according to the advancing times.

This is evidenced by the occurrence of archaic Tamil words in modern Malayalam and the customs, beliefs and festivities of the

ancient Tamils among the present Malayalees. The communications between the east and the west had been for many centuries very sporadic and not of a permanent nature. Hence there has not been any fusion between the two communities. Till lately, when the modern western civilisation brought the two people together, there was not much love lost between them, though they live as neighbours as characterised in some of the ballads sung during the festivals as those of Kongu-Pada.

The legendary origin of Malabar is depicted thus by a characteristic story in the book named "Kerolotpatti" (origin of Kerala). Parasurama after defeating and massacring all the ruling chiefs in the land to avenge the murder of his father made a gift of the conquered country to propitiate the sin and in order to find a new habitation for himself requested the Lord of the sea to give him a piece of land. The sea acceded to his request by receding and leaving a strip of land west of the Ghats. Parasurama colonised the new land with certain selected families and gave them new laws and regulations to distinguish them from the Easterners. This was the origin of the peculiar civilisation of the Malayalees as depicted in the book. This legend attempts to solve the problem how the Malayalees cultivated a system which differed so considerably from that of their eastern neighbours. But this story does not conceal one important fact that it was the Easterner who inhabited the west and thereby even in its origin both formed one and the same nationality.

The legend further proves that the country was colonised at a very late stage in history. This is supported by the fact that this strip of land lacks much in pre-historic remains which abound in the eastern districts. The prevalence of the worship of Bhagavathi and Sastha and the existence of Cobra-worship and its Kavus and the belief in the black art and incantations and mantrams are the relics of pre-historic age apart from the distinctive feature of inheritance through the female line which appears to be quite a strange custom in the eyes of their neighbours.

II. Early Tamil Period.

We mentioned above, that this strip of land once formed part of the Tamil country. This is evidenced by the earliest Tamil work, Tholkappiam. It clearly describes the Tamil country as

the land between Vengadam (Tirupathi) and Kumari (Cape Camorin), the other two sides being bounded by the seas. This definition brings Malabar within the limits of Tamil speaking country. In fact, pure Tamil or Sen-Tamil is limited to a tract known as Sen-Tamil Nadu bounded on the north by Marudai River, on the east by Maruvur, on the south by the Vaigai, on the west by Karur. The rest of the Tamil land was divided into 12 divisions or Nadus. The commentator Ilamporanar gives the names of the 12 nadus as Pongar, Oli, Then-Pandi, Kuttam, Kudam, Panri, Karka, Seeta, Pooli, Malai, Aruva, and Aruva-North, counting from South-east to North-east. Of these we can safely include Kuttanadu and Kudanadu as falling within the present Malayalam speaking country. Some scholars include Panrinadu, Karkanadu and Poolinadu also among them. The above said 12 divisions are called Kodum-tamil Nadu: The word "Kodum" means "Vulgar". When we find that even the district of Tinnevely is included in the category of 'Vulgar' speaking tracts, we can easily imagine that the portions now occupied by Malabar was inhabited by a people who spoke a language which did not differ much from the pure Sen-Tamil.

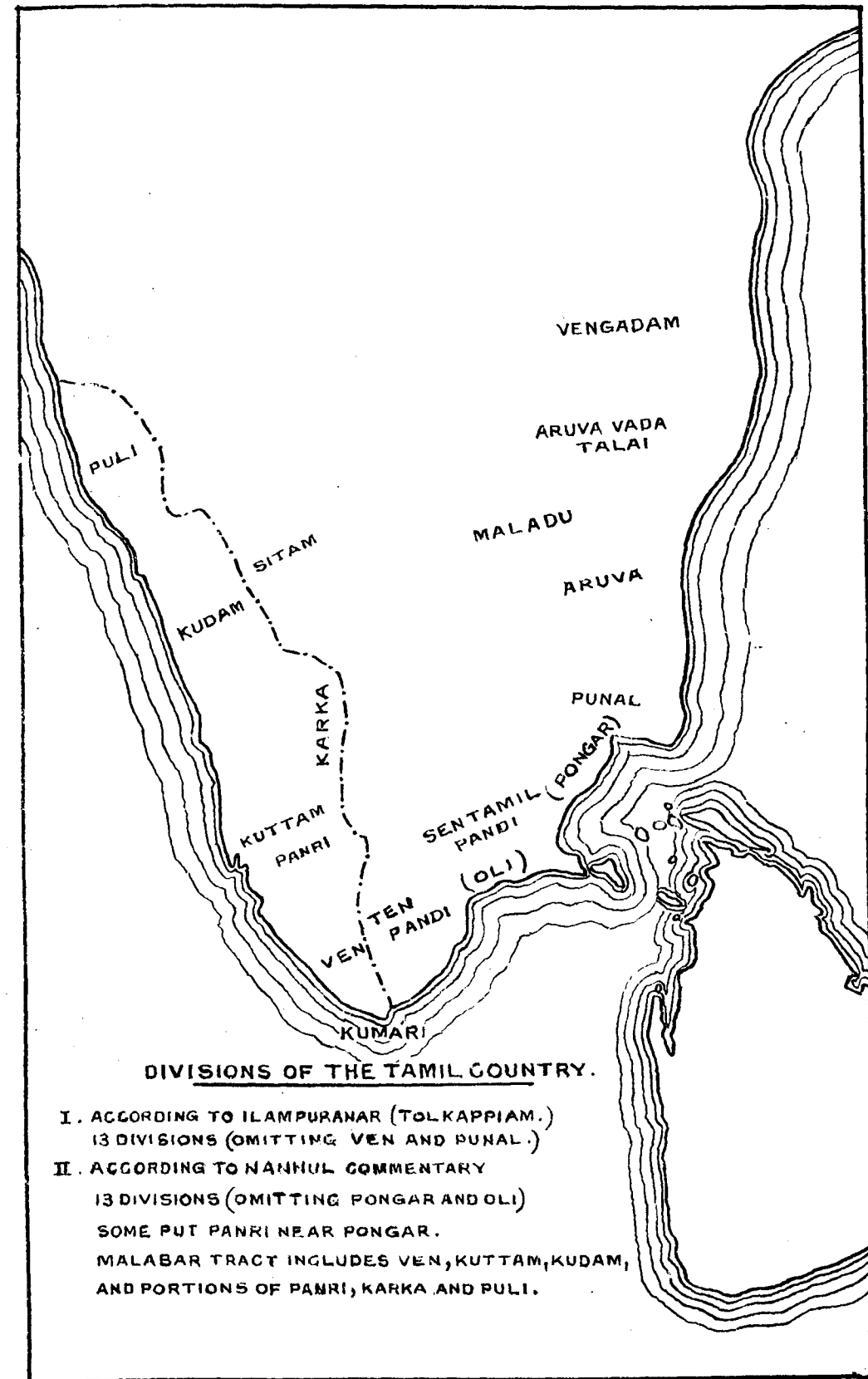
The difference between Sen-Tamil and Kodum-Tamil does not seem to be much and it may be at the most in the intonation which the people acquire among themselves owing to the climatic conditions and the usage of a few peculiar dialectical words. The ancient Tamil grammarians have noticed these differences and have classified such dialectical words under the name of Tisai-Chol. They have given a few examples also. Kudanadu had Achan (அச்சன்) for Tandai (தந்தை), Kuttanadu had Tallai (தள்ளை) for Thai (தாய்) while Venadu had Kilar (கிலார்) for Thottam (தோட்டம்). We can compare these words with the example of Ten-Pandi Nadu which had Petram (பெற்றம்) for Pasu (பசு). Now, where is the difference between the Kodum-tamil tracts of Malabar and the other Kodum-tamil tracts of the present Tamil country? Even to-day some of the oldest Tamil words now archaic are in current use in the Malayalam language. The words குப்பாயம் (coat), வஞ்சி (boat), கடவு (ford) ஒல்லா (must not), போத்து (He-buffalo) கைநிலம் (camp), வட்டி (basket) etc. are in current use in Malabar which the Tamilian would regard as quite archaic. They occur in old Tamil words.

The division of land into Kodum-Tamil Nadu seems to have changed in later days. A stanza quoted in the commentary to the famous grammar Nannool gives a few new names in the list. They are Ven, and Punal Nadu. They replace Pongar and Oli Nadus. A readjustment seems to have taken place; but the tracts, Kuttanadu and Kudanadu which formed the Malabar country have not changed. A new division Venadu falls within it. In course of time, these division seem to have given place to mere political divisions after the dynasties of their ruling chiefs namely, Chera, Chola and Pandiya. In the Malabar tract they formed Chera kingdom. Its Tamil name was Chera or Cherala while its Sanskrit equivalent was Kerala, the letter 'Ch' having been hardened. During this early period in history no change seems to have been effected in the language of the people except the difference mentioned above and in the customs and manners of the people. In fact they seem to have lived as members of one homogeneous community.

III. Sangam Age.

During the early Christian Era which is generally known as the Sangam period, the Tamilians were very advanced in civilisation. Their language was highly developed and the administration of the country was very well conducted and the trade flourished considerably. The Cholas ruled at Pugar, the Pandyas at Madura while the Cheras at Vanji (now Cranganoor). The latter has been reported to be a powerful dynasty and the details of their achievements and administration are preserved in some contemporary tamil works written by the poets of their own courts. The famous work Silappadigaram written by an ascetic brother of the Chera King, Senkuttuvan gives a graphic idea of the country of those days and depicts the incidents which took place during its authors' life-time. It further proves that Tamil was the language prevalent among the people who inhabited that tract. Paditruipatthu a book of ten poems sung in honour of the kings of the Chera line preserves some of the archaic words then current in the country and the peculiar customs and manners which those people had observed. Ainkurunooru, a collection of small poems deals with similar accounts of the people. Besides these local works, there are many other contemporary works written in the Chola and Pandya tracts which corroborate the

FIG. 9.



facts above-mentioned. Kannagi, the heroine of Silappadigaram leaves Madura after the cruel murder of her husband and reaches Vanji, the Chera capital within a fortnight and ascends to Heaven there. So the route which she would have taken from Madura to Vanji would have been along the Vaigai river in the Kambam valley and through the Periyar gap and along the Periyar river to Cranganoor near the sea coast. This route would have been the ordinary trade route during those days and communication along it would have been easily accessible for such a lonely woman to have taken to it. Soon after the deification of Kannagi, her image* was installed at Vanji by the Chera King and all the neighbouring kings were invited to attend the consecration ceremony done in honor of the deified lady. This shows the friendly relationship between the Cheras and the other neighbouring Tamil kingdoms. The names of the kings who ruled at Vanji and who have been mentioned in the ancient Tamil works above-named are mentioned in the appendix.

IV. Roman Influence.

The Cheras were powerful kings and consequently peace reigned over the land. During their rule trade with Rome flourished. Their western coast was studded with fine landing places for ships which used them as ports. This is proved by Roman authors of the times. The existence of Roman coins in the Tamil country is another proof of the huge trade which Rome had with the Tamils. The Kongu Nadu which lies just east of the Chera Nadu has a very flourishing trade during those days. It abounded in mineral wealth. The beryls of Padiyur were world-famed. The Roman ladies vied with each other in wearing those precious gems. Other minerals and spices as well, brought Roman trade and their wealth nearer home. There is reason to believe that Rome would have even opened a colony somewhere in Kongunadu or at least a trade centre in that country in order to facilitate their interests in trade. This is evidenced by the abundance of Roman coins dug out from the ground at various places in Kongunadu. Perur, Vellalore, Pollachi, Kalayamputhur, Karur are some of the places where hoards of Roman

*Some scholars would identify this image with that of Bhagavathi at Cranganoor.

ing from the reigns of Emperor Augustus to Nero and acalla to Constantine were discovered. Even quite a second find was accidentally discovered by a village Vellalore on 16-1-1931. It contained 121 coins, many of the reigns of Augustus and Tiberius. The coins were seemed to have been buried under-ground to escape enemy most probably political. Such discoveries corroborate the theory of trade relationship between Rome and the South. Moreover the ancient Tamil works like Pattinapalai padigaram prove that Roman artisans and soldiers had employed by the Tamil kings in their service. Kongu and Madurai are inland ones and in order to have trade with the sea there would have been routes of communication with along the coast. For Kongu country the nearest route to the coast is *via* Palghat gap to reach the ancient ports of Tondi near the mouths of Periyar. The powerful Cheras seemed to have helped trade to a considerable extent and purpose would have been in cordial relationship with neighbouring states of Kongu and Madura. The existence of coins from the early Christian era till the third century, extending to fourth century, shows that trade continued flourishing till the fourth century and that intercommunication between the western and eastern sections of the Tamilians till that period without any intervention.

V. Later Cheras.

After the fall of Rome their trade disappeared. The inland Cheras seemed to have declined soon after, as no mention of their names is found anywhere in the old books of the South, but the existence of one minor chief by the name Aiyana-Perumal proves that there were minor chiefs ruling in the country after the split up of the earlier dynasty. The above-said poet was the author of a Tamil work 'Purapurul Venba Malai', which deals with the state of affairs in the administration of the country and the methods of warfare. It shows that political-military science had developed to a considerable extent. The rules prescribed by the author show that he was an adept in sciences. The work is written in Tamil poetry and it is to show that Tamil was still the language of the country.

This poet-prince would have lived about 3 or 4 centuries after the Sangam age.

During this period the country seems to have been divided into various small principalities, the chief among whom seems to have styled himself as Cheraman Perumal. There were several Perumals who ruled at Cranganoor the last of whom became according to a tradition a convert to Muhammadanism and seems to have gone to Mecca. Though the country had been split up into small states under different rulers, yet the general conception seemed to have been that the land was one province as evidenced by the definition given to Cheranadu in the stanza.

“ வடக்குத் திசைபழனி வான்கீழ்த் தென்காசி
குடக்குத் திசை கோழிக் கூடாம்—கடற்கரையின்
ஓரமோ தெற்காகும் உள்ளென்பதின் காதம்
சேரநாட் டெல்லையெனச் சொல்.”

The boundaries for the Chera Nadu according to the above stanza are Palni on the north, Sengodu towards the east, sea towards the south and Calicut towards the west. It is clear that during this period there was frequently communication between the east and the west mostly through the Palghat gap and through the plain near the cape. We find that during this period Tamil continued to be the language of the country and that the kings of the land had benefited to a great extent by the achievements in administrative and military matters by the eastern kings as is evidenced by the codification of those rules by the above-mentioned prince-poet in his famous work *Purapurul Venba Malai*.

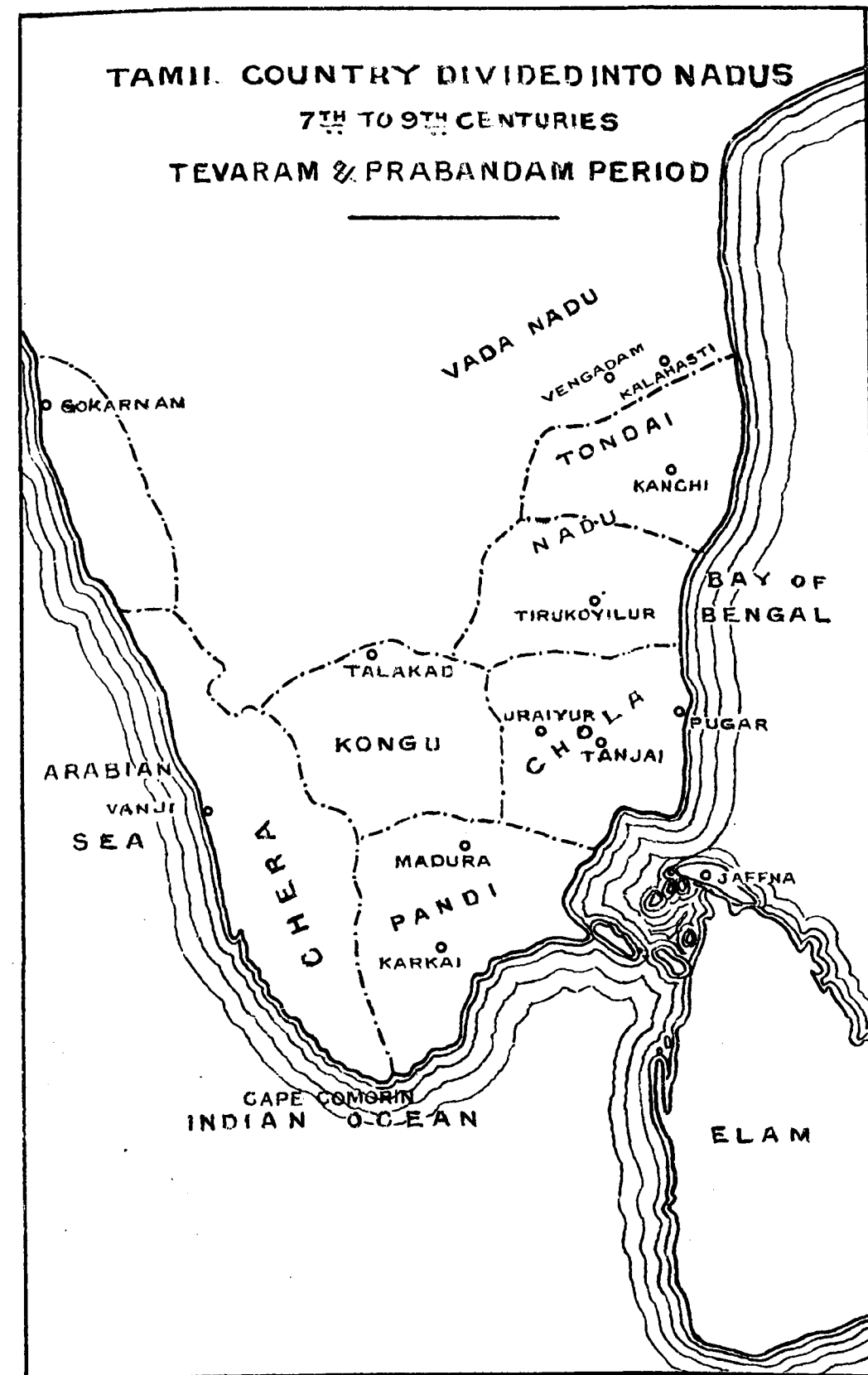
VI. Kollam Era.

The Kollam or Malayalam Era began in the year 825 A. D. Some scholars say that it represents the conversion of Cheraman Perumal into Muhammadanism and his departure to Mecca after making a division of the country into several principalities and handing them over to various chiefs. But the great Tamil work Periyapuranam gives a different account. Cheraman Perumal was a great Saivite devotee and a friend of Sundaramurti Nayanar. Both of them had made tours of pilgrimage to various temples in the east and finally settled at Thiruvanjai Kalam, the capital of the Cheraman. There, after a period of devotional

life when they had sung songs in praise of Siva, they entered Kailasa. The poems sung by Sundaramurthi are found in the Thevaram collections and the poetical songs by Cheraman called Gnana Vula or Athi Vula is also included in the existing Tamil collections. It is clear that the language which was spoken in this land had been Tamil and that there had been communications, religious, social and commercial, between the east and the west during this century. Both the eastern and western lands seem to have enjoyed peace. Cordial relationship seems to have existed between the rulers of the various states. For, we find the Chera king, Cheraman Perumal taking trips along the Kongu, Chola and Thondai Nadus while Sundaramurthi was also allowed to pass through Kongu and Chera kingdoms unmolested. The route which Sundara seems to have taken to pass from Chola Nadu to the west coast seems to have been along the Noyyal valley and through the Palghat gap and on the return journey he seemed to have taken the route along the Amaravathi valley. These two routes seem to have been frequented much by the traders during the period. A detailed account of these trade routes is given in my work on "Sundara and Kongu Nadu."

Another king-poet of this period was Kulasekara Perumal. He was a Vaishnavite devotee and his name is included as one among the twelve Alvars. He was a Tamil as well as a Sanskrit poet. He also travelled much in the east by way of pilgrimage to various religious Vaishnavite centres. He has sung devotional songs not only of temples of the east like Chidambaram but he has also sung about a shrine in the west coast named Vithvakodu. The language used by this poet is Tamil and much difference is not seen between that used by him and that used by the eastern poets. Two other Vaishnavite poets Thirumangai Alwar and Nammalwar who belong almost to the same period have visited several temples in the west and have left songs about them. A country which allowed such persons to travel and had appreciated their songs in Tamil would have no other spoken language or dialect than the one which they understood. Hence also we can easily come to the conclusion that Tamil was then the language of the country. The last-named two poets who belong to the Tinnevely District seem to have taken the route along the Comorin gap and temples which they visited are also mostly in

FIG. 10.



the southern portion of Kerala. We may easily presume that along this gap there was social as well as commercial communications between the two portions of the country.

In this connection it is curious to note that most of the poets of the Chera Nadu had been princes who ruled the country. It is a wonder to find the complete absence of a commoner poet in this part of the country. It is a problem worthy of examination and investigation. We may point out in this connection that Sankara who was born at Kaladi became a widely known figure in religious reform throughout India, but as he had very little to do with Tamil country, we have not much to say about him.

VII. Chera occupation of Tamil Country.

We have seen that till the last period there existed cordial relationship between the kingdoms of the West and of the East and consequently peace reigned among them resulting in social inter-communion and trade facilities. From this period the cordiality became broken and hostility and the consequent inroads and raids came into existence. This state of affairs estranged the peoples from one another and each community began to grow in itself without inter-change of ideas and customs. This formed the cause of isolation of the peoples of the west coast from the east and for the origin of a separate language Malayalam which developed itself from a dialect into an independent language.

The breach in cordiality and the consequent hostilities are evidenced by a number of inscriptions which have been recorded on the temple-walls. The Chera princes made a number of inroads into the Kongu country at various periods in history from the 8th till the 12th centuries. Not only did they invade the Kongu country but also seem to have annexed certain portions of the country to their states. According to the custom of those days they even renamed certain villages and towns, tanks and channels in their own names. From a perusal of the inscriptions which enumerate their exploits we could easily conclude that they took the route along the Palghat gap for their path of invasion. After passing the Palghat gap they seem to have invaded the West-Kongu in one of their actions and had extended their conquest along the Noyyal valley as far as Erode. Another line of

action had been taken south-eastwards through Amaravathi valley till they reached Palni.

In their conquest of West-Kongu they had reached the foot of Vellimalai on the Western Ghats. West-Kongu was then known as Perur Nadu. At the temple of Nageswara on the river Noyyal or Kanjima Nadi very near the foot of Vellingiri Hills there is an inscription which calls the place Muttam or Amara-bujanga-Chadurvedimangalam. This name testifies that the place had been conquered by the Cheras and renamed after the king who conquered it. Other inscriptions of the place as well as those of Perur and Vellalore—all within Perur Nadu, give a few other examples which had been named after their Chera conquerors. Athirajaraja Vaikal, Ravivarma-Chadurvedimangalam are some of them. The modern town of Coimbatore then called Kovanputhur had been then merely a hamlet of Perur and had been named as Veerakerala Nallur, evidently renamed after its conqueror Veerakerala. This information is given not only by an inscription at Perur but also by another at Komaralingam along the Amaravathi valley. It is interesting to note at this juncture that there is still a village in existence by the name of Veerakeralam within 3 miles west of Coimbatore. We understand from the inscriptions that this conquest would have taken place from the 11th to the 12th centuries. Most of them have been dated during the reigns of the Kongu-Cholas, Veera-Chola (1183-1206) and Veera Rajendra (1207-1252).

But far earlier than this period there seems to have been another invasion as testified by two inscriptions at Vellalore, a town belonging to the Perur Nadu. They mention the names of two Kerala kings Kokandan Ravi and Ravinarayana who are said to have belonged to Chandrathithya Kula. The inscriptions are in very old archaic characters. It is conjectured by the Government Epigraphist that these kings are identical with those of Thillaisthanam inscriptions of Aditya I (9th century latter half). From the Palaeographic point of view the inscriptions are assigned to the 8th century. In this connection we have to mention that Thirumurugan Poondi and Firamiyam represent two other inscriptions which give the names of similar Kerala kings. The existence of the name of Ravikothai and Kokalimurka at the temple of Erode go to show that the Kerala conquest had gone as

far as Erode. Namakkal of the Salem district is another remote corner which scents of Kerala influence.

Now coming to the second line of operations made by the Keralas we are led to believe by the inscriptions that it took along the Amaravathi valley. The Cheras seem to have passed Pollachi on their way as evidenced by an inscription in the Subramaniya Temple at that place. The temple of Komaralingam on the river Amaravathi mentions Kerala names in 9 of its inscriptions. The name of a channel (Adhirajaraja Vaikal) that of a division (Veerakeralavala Nadu) that of a town (Kerala-Kesari Nallur) and lastly even that of a deity (Adirajaraja Eswara, testify how far the Cheras had influenced this fertile valley. Palni is another place which had been considerably influenced by the Kerala conquest as it represents ten inscriptions of this category. Most of them are in archaic Vetteluthu characters which prove their antiquity. They also testify to the renaming of villages and other objects after their Kerala conquerors. Kodaimangalam, Iravimangalam, Amarabujanga, Veerakerala-Adirajaraja, and Veeranarayana Veerakerala are some of the examples found in those inscriptions.

Apart from the Palghat gap we know that there is another route of communication between the west and east at the extreme south of the Peninsula. Rivalry had existed for considerable time between the West—(Cheras) and the East—(Pandyas) as regards the ownership of the tract of land very near the cape which formed part of the old Ve-Nadu. The inscriptions at Kalukumalai and at Tenkasi in the Tinnevely district show that during the reign of Maran-Chadayan, a battle between the Pandiyas and Cheras was fought at Vilinam. The date which is assigned to this Pandya prince is 770 A.D. This rivalry for the occupation of the border land seems to have continued till a late date as a result of which we find that even to-day the whole of the Travancore territory south of Trivandrum is occupied by the Tamil speaking communities.

VIII. The Invasion of Tamils into Kerala.

In the last section we have seen that there was a collision between the eastern and the western people after a long period of cordiality. We have also seen that in the north, Palghat gap

seems to have been the basis of the line of operations to be carried on till the time of hostilities as it had been the route for social and commercial purposes in the past. While the Keralas had been making inroads into the Kongu country as mentioned in the last section, the Cholas who were just then ascending into power did not sleep over the matter. Aditya I, the first Chola king who established a powerful dynasty rose against Kerala as evidenced by Thillaisthanam inscriptions. Next comes Paranthaka I who seems to have maintained a sort of friendly relationship with the Cheras. Rajadiraja I is attributed to have conquered the 'Salais' of the Cheras. The claim of Rajaraja I and of Rajendra Chola is established by a few inscriptions in Tinnevely which mention that in Sundara Chola Pandiya's time (1121-1143) Chera territory was conquered. Kulothunga I was another king who had claimed to have occupied the Chera territory. Kulothunga III was the last king who had assumed the name Chola-Kerala Deva. From the above remarks we see that the Imperial Cholas had to do much with the Kerala territory and seem to have occupied considerable portions of it from the 10th to the 13th centuries.

IX. A few characteristics of the last period.

We have seen that it was the custom of the conquering people to celebrate their victories by renaming towns etc., after themselves. We have already mentioned a list of names which show the Kerala influence in Kongu country. Now quite in contrast with the above-said nomenclature we find the imperial Cholas giving the names for places in their own territory celebrating their conquest over the Keralas. Typical examples are found in the names given below :—

Kerala Kesari Nallur, (Coimbatore Dt.).

Kerala Kulasami Chaturvedimangalam, (Tanjore Dt.)

Keralantaka Chaturvedimangalam, (Tanjore Dt.)

Do. Madam, (Trichinopoly).

Do. Nallur, (North Arcot Dt.)

Do. Puram, (Madura).

Do. Valanadu, (Trichy and Pudukotta).

Do. Vilupparaiyan, (Tanjore).

Do. Vinnagar, (North Arcot).

Keralasinga Vala Nadu, (Coimbatore, Ramnad and Pudukotta).

Peace facilitates trade and we have seen in the earlier centuries when there was peace there was considerable trade between the east and the west. Now during this period of hostilities trade would have suffered much. But there is one interesting record which shows that the Chera merchant by name Adirama Keralan had made a gift to a certain temple in the North Arcot district in the year 1238 during the reign of Rajaraja III. This proves that trade was not altogether extinguished by the hostilities or invasions on either side.

Among the ancient Tamils, as was the custom among the Aryans also, cattle-raid was a preliminary step for warfare. In later days attack on merchants and the capture of their goods formed one of the chief causes for bringing two parties into a regular warfare. One such important instance occurred on the border land between Malabar and Kongu country. That incident is still preserved in the celebration of the festival known as Kongu-padai at Chittur in the Cochin state very near Palghat. In fact it is one of the biggest festivals which attract a huge crowd from the neighbourhood and which commemorates the victory over the Kongans by the Malayalees under the leadership of a tutelary goddess, Chitturiyamman. A few Kongu merchants took articles of merchandise into the Malabar territory. They lost their articles in the river and on returning to their country complained to their king that the Malayalees robbed them of their goods. Thereafter at the order of the Kongu king his minister Hiranyamurthi Pillai sent an ultimatum to the Malayalees that, unless the robbed goods were delivered, their territories would be invaded. This declaration was sent to Chittur through a Paraya Woman named Arathi on the 17th Kumbam 71 of Kollamera. The Malayalees of the 100 Nayar houses at Chittur met before the temple of their goddess and decided to fight. The Palghat Raja, who was expected to come, did not go till the evening. The people prayed to the goddess and a voice was heard from the Goddess promising help. The Kongu chief came riding on a huge buffalo. In the battle which ensued the Nayars were defeated and the Kongu chief entered their quarters. The Chittur people prayed earnestly and invoked the aid of their goddess. Their prayers were heard and the goddess appeared with the sword on hand and drove away the Kongans from Chittur. At a

place about 2 miles east of Chittur the goddess cut off the head of the enemy's buffalo and later on took the head of the Kongu chief Rajadirajan and washed the sword in the river near by and returned to the temple. The place where the buffalo fell is still known as Pottuadi Parai, the river where the sword was washed is known as Valayar and the goddess became known as Chittur Baghavathi.

The above said incident is regularly enacted during the festival of Kongupada in the month of Kumbam or Masi and the account written in a cadjan leaf and preserved in the house of the chief priest of the temple is read every year on the night of the festival day. It is impossible to get a correct copy of the account from the priest as he refused to show it in public; but a fairly correct account is published in a book in Malayalam by Mr. Ramachandra Menon of Chittur and is available for the public.

The above said battle is said to have taken place in the Kollam year 71 corresponding to 896 A.D. Various other dates are also given by various scholars. Anyhow we can safely presume that this incident had taken place at a period when the westerners and the Tamilians were at logger-heads, namely the period with which we are dealing at present. It further shows how hostilities among merchants become the cause of general warfare between different states. Since the above said incident there is not much love lost between the Kongans and the Malayalees and the feelings have been preserved till to-day by the enactment of the farce during the Kongupada festival.

X. Growth of Malayalam Literature.

The imperial Cholas began to decline by the end of the 13th century. All their subordinate dominions began to establish their own independence. The Pandiyas rose into power in the south. The feudatory Pallava chief, Ko-Perunchinga rose into power in Thondai Nadu while the Hoysalas of the Mysore Plateau encroached on the land towards the south. There were none to peep into the Malabar side whose chiefs began to rule in their own state. From this time for a number of centuries Malabar was left unmolested. They cultivated their own taste according to their ancient customs and manners which resulted in the growth

of a separate literature for themselves. In the east after the Hoysalas, the Muhammadans swept over the peninsula and destroyed all the ancient kingdoms. Next Vijayanagar came on the stage and swayed over the whole of the Tamil country. Their viceroys, the Nayak Chiefs of Madura and Tanjore, Therkanambi and Ummathur chiefs and Udayars of Mysore played their part over the country. But none of these chiefs ever set their eyes beyond the Western Ghats and hence there was not the slightest intervention with the growth of Malabar character except from a few foreign western merchants who came there for trade and never inter-meddled with their private affairs. Hence the touch of the Tamilians with Malabar was lost.

It would be interesting to study the early poetry of the Malayalam literature especially the stanzas of Thunjath-Eluthachan. If we read a few lines of his work or transliterate them in Tamil alphabet, any Tamiliyan can easily make out its meaning. The preservation of ancient archaic words in the common Malayalam parlance is a noteworthy fact.

After the lapse of several centuries for the first time Tippu Sultan of Mysore invaded Malabar and penetrated into the country as far as the lines of Chalakudi. He erected or repaired the forts at Palghat, Kannanore and Thalacheri. He had taken the routes along the Coorg and Vayanad to reach the Malabar territory. What had been impenetrable forest was laid open for communication by him. His adventure later on led to the occupation of the British and a new era of the disappearance of barriers by way of impenetrable forests and difference in customs and manners, language and civilisation has set in. The Tamilian found a Rip-van-winkle in his neighbouring districts to his utter surprise when he came in contact with him. After the advent of the new era the surprises are slowly disappearing with the acquisition of more knowledge by way of researches into the ancient lore and discoveries made out of worm-eaten cadjan leaves.

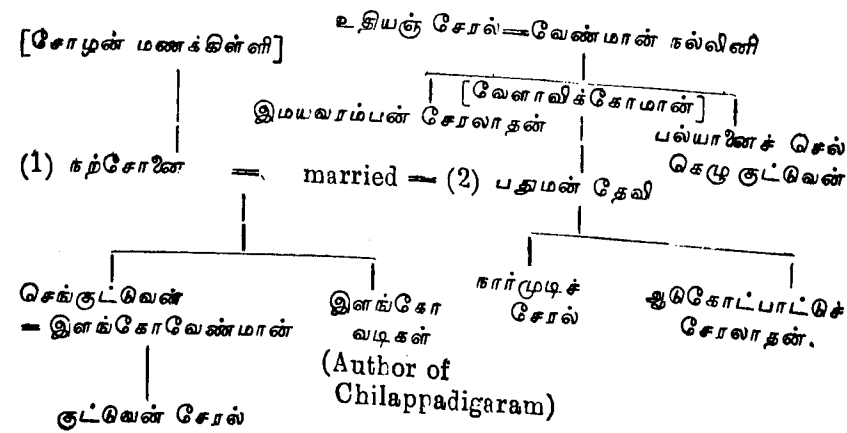
APPENDICES

- I. Chera Dynasties.
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APPENDIX I

A. Chera Dynasty—சேரவம்சம்.

(சங்கத்தார் காலம்)



B. தாயத்தார் (Agnates) இரும்பொறை மரபினர்.

1. மாந்தரம் பொறையன் கடுங்கோ
2. கருஜரெறிந்த ஒள்வாட் கோப்பெருஞ் சேரலும் பொறை
3. அந்துவஞ் சேரலும் பொறை
4. செல்வக் கடுங்கோ வாழியாதன்—பதுமன் தேவி
5. தகரெறிந்த பெருஞ்சேரலும் பொறை—அந்துவஞ்சென்னை
6. இளஞ்சேரலும் பொறை
7. யானைக்கட்சேய் மாந்தரஞ்சேரலும் பொறை
8. கணைக்காலும் பொறை

APPENDIX II

Specimens of Sangam Poetry of Chera Nadu

1. பதிற்றுப்பத்து.

சென்மோ பாடினி நன்கலம் பெறுருவை
சாந்தம் பூழிலொடு பொங்குநுரை சுமந்து
தென்கடன் முன்னிய வெண்டலைச் செம்புன
லொய்யு நீர்வழிக் கரும்பினும்
பல்வேற் பொறையன் வல்லனா லளியே.

2. சிலப்பதிகாரம்.

“சிறுகுடியீரே! சிறுகுடி யீரே!
தெய்வங் கொள்ளுமின் சிறுகுடி யீரே!
நிறங்கிள ருவிப் பறம்பின் தாழ்வரை
நறுஞ்சினை வேங்கை நன்னிழற் றீழோர்
தெய்வங் கொள்ளுமின் சிறுகுடி யீரே!
தொண்டகந் தொடுமின் சிறுபறை தொடுமின்
கோடுவாய் வைம்மின் கொடுமணி யியக்குமின்
குறிஞ்சி பாடுமின் நறம்புகை யெடுமின்
பூப்பலி செய்ம்மின் காப்புக்கடை நிறுமின்
பரவலும் பரவுமின் விரவுமலர் னுறுமின்
ஒருமுலை யிழந்த நங்கைக்குப்
பெருமலை தஞ்சாது வளஞ்சரக் கெனவே.”

APPENDIX III.

List of Roman Coins found in Kongu Nadu

I	Augustus.	B. C. 44-14 A. D.	Pollachchi (1888), Vellalur (1842 and 1931) and Karur (1878).
	(a) Drusus	B. C. 8	" Vellalur (1842) Kalayamuthur (1856).
	(b) Antonia	"	" Karur (1806)
	(c) Germanicus	"	" Vellalur (1842).
II	Tiberius	A.D. 14-37	" Pollachchi (1800), Karur (1806 and 1878), Vellalur (1842 and 1931), Cannanore (1851), Kalayamuthur (1856).
III	Caligula	37-41	" Vellalur (1842 and 1931), Kalayamuthur (1856).
IV	Claudius	41-54	" Karur (1806), Vellalur (1842), Kalayamuthur (1856).
V	Nero	54-68	" Cannanore (1851), Kalayamuthur (1856).
VI	Domitian	81-96	" Kalayamuthur (1856).
VII	Nerva	96-98	" do.
VIII	Trajan	98-117	" do.
IX	Hadrian	117-138	" do.
X	Commodus	180-193	" do.
XI	Constantinus	323-337	" Karur and Vellalur (1931).

APPENDIX IV

Specimens of Chera Tamil Poetry 9th & 10th Centuries

1. சுந்தரர்—திருவஞ்சைக்களம் - தேவாரம்.

தலைக்குத் தலைமலை யணிந்த தென்னே

சடைமேற் கங்கை வெள்ளந் தரித்த தென்னே

அலைக்கும் புலித்தோல் கொண்டசைத்த தென்னே

யதன்மேற் கதநாகங் கச்சார்த்த தென்னே

மலைக்கு நிக ரொப்பவன் நிரைகள்

வலித்தற்றி முழங்கி வலம் புரிகொண்

டலைக்குங் கடலங் கரைமேன்

மகோதை யணியார் பொழி லங்கைக்களத் தப்பனே.

திரு நொடித்தான் மலை.

ஆனை யுரித்த பகை யடியேனெடு மீளக்கொலோ
ஊனை யுயிர்வெருட்டி யொள்ளியானே நினைத்திருந்தேன்
வானே மதித்தமரர் வலஞ்செய் தெனை யேறவைக்க
ஆனை யருள் புரித்தான் நெடித்தான் மலை யுத்தமனே.

2. சேரமான் பெருமாள்—பொன்வண்ணத்தந்தாதி.

பொன்வண்ண மெவ்வண்ண மவ்வண்ணமேளி பொலிந்திலங்கு
மின்வண்ண மெவ்வண்ண மவ்வண்ணம் வீழ்சடை வெள்ளிக்குன்றந்
தன்வண்ண மெவ்வண்ண மவ்வண்ண மால்விடை தன்னைக்கண்ட
வென்வண்ண மெவ்வண்ண மவ்வண்ணமாகிய வீசனுக்கே.

ஆதி. உலா.

திருமாலு நான்முகனுந் தேர்ந்துணரா தன்றங்
கருமாலுற வழலாய் நின்ற—பெருமான்
பிறவாதே தோன்றினான் காணாதே காண்பான்
ஹவாதே யாக்கை துறந்தான்.

3. குலசேகரப் பெருமாள்—விறுவாக் கோட்டம்மாள் - திருமொழி.

தருதுயரம் தடாயேலுன் சரணல்லால் சரணில்லை
விரைகுழவு மலர்ப்பொழில்சூழ விறுவாக் கோட்டம்மானே
அரிசினத்தா லீன்றதா யகற்றிடினும்—மற்றவள்தன்
அருள்நினைத்தே யழும்குழவி யதுவேபோன் நிருந்தேனே.

4. நம்மாழ்வார்—திருவனந்தபுரம்.

கெடுமிட ராய வெல்லாக் கேசவா வென்ன—நாளும்
கொடுவினை செய்யுங் கூற்றின் தமர்களுள் குறுககில்லார்
விடமுடை யரவிற் பள்ளி விரும்பினான் சுரும்பலற்றும்
தடமுடை வயலநந்த புரநகர்ப் புகுதுமின்றே.

5. திருமங்கை யாழ்வார்—திருவல்லவாழ்.

தந்தைதாய் மக்களே சுற்றமென் றுற்றவர் பற்றினின்ற
பந்தமார் வாழ்க்கையை நொந்துநீ பழியெனக் கருதினாயேல்
அந்தமா யாதியா யாதிக்கு மாதியா யாயனாய்
மைந்தனார் வல்லவாழ் சொல்லுமா வல்லையாய் மருவுநெஞ்சே!

APPENDIX V.

List of Inscriptions to show Chera inroads into the Kongu Country.

Reference Nos.	King's Reign.	Special Particulars.
Coimbatore Dt. Avanashi No. 9	Virarajendra Deva 29th year.	1 Muttam alias Amarabhujanga Chaturvedimangalam. 2 Perur-Pathisvara. 3 Kovanputhur alias Virakeralanallur.
Vellalore No. 106	Chera, Kokandan Viranarayana. 11th year.	the king belonging to Chandraditya kula.
107	Chera Kokandan Ravi 24th year.	of Chandraditya kula.
Bolumanpatti 116	Virarajendra Deva 27th year.	Adirajarajan Tirumadai Vilagam.
117	Raja Raja Deva 3rd year.	Muttam alias Amarabhujangara Nallur.
120	Virarajendra Deva 27th year.	Names of Chera kings Adirajaraja Deva and Rajaraja Deva mentioned. Also, Ravivarma Chaturvedimangalam.
121	Vikrama Chola 32nd year.	Ravivarma Chaturvedimangalam and Amarabhujanganallur as surnames of Muttam.
Erode 141	Ravi Kodai alias Kokalimurkan 4th year.	
144	Ko Ravi Kodai 22nd year.	
154	Ko Kalimurkan.	
Komaralingam 405	Rajasekharavarman	Adiradaraja Vaikal.
412	Virarajendra Deva 10th year.	Adiradarajan Tirumadai Vilagam.
426	Virarajendra Konerinmai kondan.	Kovanputhur alias Virakeralanallur in Perur Nadu.
427	Konerinmai kondan.	Adiradaraja Isvaram Udayar.
430	Do. 17 years.	Amarabhujanganallur.

207

Reference Nos.	King's Reign.	Special Particulars.
Sangramanallur 439	Virachola Deva 21st year.	Seranai Merkonda Solan Peruvai.
453	Viranarayana 8th year	Kerala Kesari Nallur.
457	Konerinmaikondan	Tiruvallanturai alias Kerala Kesari Nallur.
Tirumurugan Pundi 114-15		Amarabhujanga Chaturvedi Mangalam.
Piramayam 196-20		Kerala Kesari Amarabayankura Kotpuliya.
Madura Dist. Palani. 277	Kerala King Viranarayana Virakerala 11th year	Iravimangalam.
278	Viranarayana Virakerala 8th year	Kodaimangalam and Amarabhujanga.
279	Viranarayana Atisaya Sola. 31st year	
280	Vira Kerala Amarabhujanga Varman 23rd year	
281	Adiradaraja Rajarajadeva 4th year	
282	Vira Kerala Adhirajarajadeva 40th year	Kodaimangalam.
284	Vira Kerala Amarabhujangara Varman 28th year	
285	Vira Narayana Vira Kerala 29th year	
286	Vira Kerala Vira Narayana 6th year	
287	Vira Kerala Amarabhujanga Varman	
289	Vira Narayana Atisaya Deva	

Reference Nos.	King's Reign.	Special Particulars.
290	Vira Narayana Ati-saya Deva	
291	Vira Narayana Ati-saya Deva	
Salem Dist. 217	Mani Kuttuvan ancestor of Vira Kerala.	
Nammakal Taluk		

APPENDIX VI.

List of Inscriptions showing Chola and Pandya Interference with Cheras.

Reference Nos.	King's Reign	Special Particulars.
Tinnevelly 248 & 249.	Ko Maran Jadayan 770 A. D.	Battle of Vilinam.
Travancore 220	Do.	
Tanjore 1403.	Aditya I.	Stanu Ravi (Tillaistanam).
N. Arcot 114.	Parantaka I.	Nediya Teli of Kodungalur.
Chingleput 1038	Do. 29th year.	Iravi Nili, daughter of Vijja Raghava Deva—Chera king.
Tanjore 1232 } 1235 }	Rajadiraja I 33 & 35 years.	Salai of Chera conquered.
1387	Rajadiraja I.	Treasures seized from Chera.
Travancore 23	Do.	Salai conquered.
Tinnevelly 82 to 84	Sundara Chola Pandya (1021-43).	Chera Raja Raja Deva occupation during Chola kings Raja Raja I and Rajendra I.
N. Arcot 393 & 394.		Adigaiman of Chera dynasty.
554 & 555.	Raja Raja III.	trade facilities.
S. Arcot 1	Kulothunga I.	burnt Kottaru (near Cape).
104/23 } 521/22 }	Vira Kerala Adiradaraja Deva.	
86/24	Kulothunga III.	Chola Kerala Deva.
Tenkasi 17/18		Kerala Nama Udaiyar Vira Martanda.

APPENDIX VII

Kongupada Songs Sung by the Girls at Chittur

(a) முத்தொடு தாமர குணமுள்ள கொங்கு மாராஜ ராஜனே கேள்
முந்தினநாடு வாழாதே மந்தன்று சங்கீத கர்ப்பாசனனாய்
எத்திர நான் கொதிச் சங்கிருந்து தங்களை வந்து காண்பான்
எகேலுதவி குடியே நாளில் இங்ஙனே வந்து கண்டு
சித்திர மத்திலோ ஒக்குவதில்லே நீ ஒரு வார்த்தா சொன்னால்
சிலோதி ஆகிய நல்குணமும் குரன் நீ யெழுத்து முன்னோன்
ஒத்தொடு மிச்சிருந்து பாஞ்ரு என்குதி எல்லாம் வீடியே
ஒரு மயில் வாழும் மன்மது சேரு தூற்றிருபத்தி ஐயாண்டு
நீ மற்றலில் மிகவுள்ள கவிராஜரில் முன்பில் புகழும் அறியாதே
அடியோனும் முறை சொல்வான் கருதி தகமன மகுழ ஒருதி
பழைய னூரியே.

(b) The Letter containing ultimatum sent by the Kongu Chief to Chittur on the midnight of 17 Kumbham 71 Kollam era on the eve of the fight through a Paraya woman Arathi. This is read from a odjan leaf even now at the Kongupada festival at Chittur. Transliterated from Malayalam.

கலியுகத்தில் ஸ்ரீ மஹா மண்டலத்தில் கண்ட நாகொண்ட ராஜன்,
கொண்ட நாகொடாத ராஜன், அரிய விபாடன், கொடிய களவிபாடன்,
வார்த்தக்குத் தப்புவரா தெளியகண்டன், அரிய விபாடன், இந்த ராசி
அந்தணன், ராஜாக்கள் தம்புரான், ஒரு புடல் நிழல் தோண்டவன், நட
பெட்டு கொண்டருளிய ராஜன், ராஜாதி ராஜன், ராஜ மார்த்தண்டன்,
ராஜ பரமீசுவரன், பதினெட்டு கொட்டத்தில் முனியகண்டன், அரிய
கேசரி, பீம கேசரி, பொலிமுகவாரி * *

* அனுமகொடி அர்ச்சுனன், மகோடிமான வீரனென்று சொல்லப்பட்ட
தில்வாக் கோட்டமும் கொண்டருளிய ராஜன், தென்மண்டலத்தில் பிர
தான சேகரன் சோழ மண்டலத்தில் பிரதிஷ்டாச்சாரியன், கொங்கு
மண்டலத்தில் தானா வனத்தாச்சாரியன், மல மண்டலத்தில் மஸ்தகா
குரன் முகம்கொண்டு மூக்கிட்டோடும் ராஜ ராஜனருளிய கண்டன், தான
மந்நரை, தெரிய ராஜனை, சேனமந்நரை, செருக்குளர்த்த மர்த்தீட்டுன்ன,
துஷ்டர்களை ராமரெங்கிற ராஜன், சலதுக்கா நாழிகமும், விருதுக்கா
வேதகன், பூர்வ திக்கில் புண்டரீக லக்ஷ்மி, காருணிய தக்ஷிண திக்கில்
ஸ்ரீலோக நாராயணன், பஸ்சிமதிக்கில் பரிசுமுள்ள மேளம், உத்தராதிக்
கில் லோகமன்மதன், சற்றுவது தேசத்து ஸ்தான மானுத்தா சாரியன்,

ஸ்தானமான தேசத்து கோலாஹலத்தாசாரியன், சண்முகம் பிரமாண
சாரியன், சும்ப்ரமம் ஸ்னபாக்கிய சல்புத்தர் சல்லாபதி வல்லபராஜன்,
பச்சரசுமேளம் சித்தியாத ராஜன், ஹரன் ஹருதவன், அசதிலன், மற
வாத ராஜன், துஷ்டடிக்ரஹ சிஷ்டபரிபாலக சம்பன்ன வல்லப ராஜன்,
வில்லக்கு விஜயன், சொல்லக்கு தர்மன், ஒரிமேல் உதயன், வாளுக்கு சஹ
தேவன், தண்டுக்கு பீமன், நடப்புக்கு பீமன், வாளுக்கு சந்த்ரன், ஒளிக்கு
கதிரவன் பூ பட்டார்சாலுகன்.

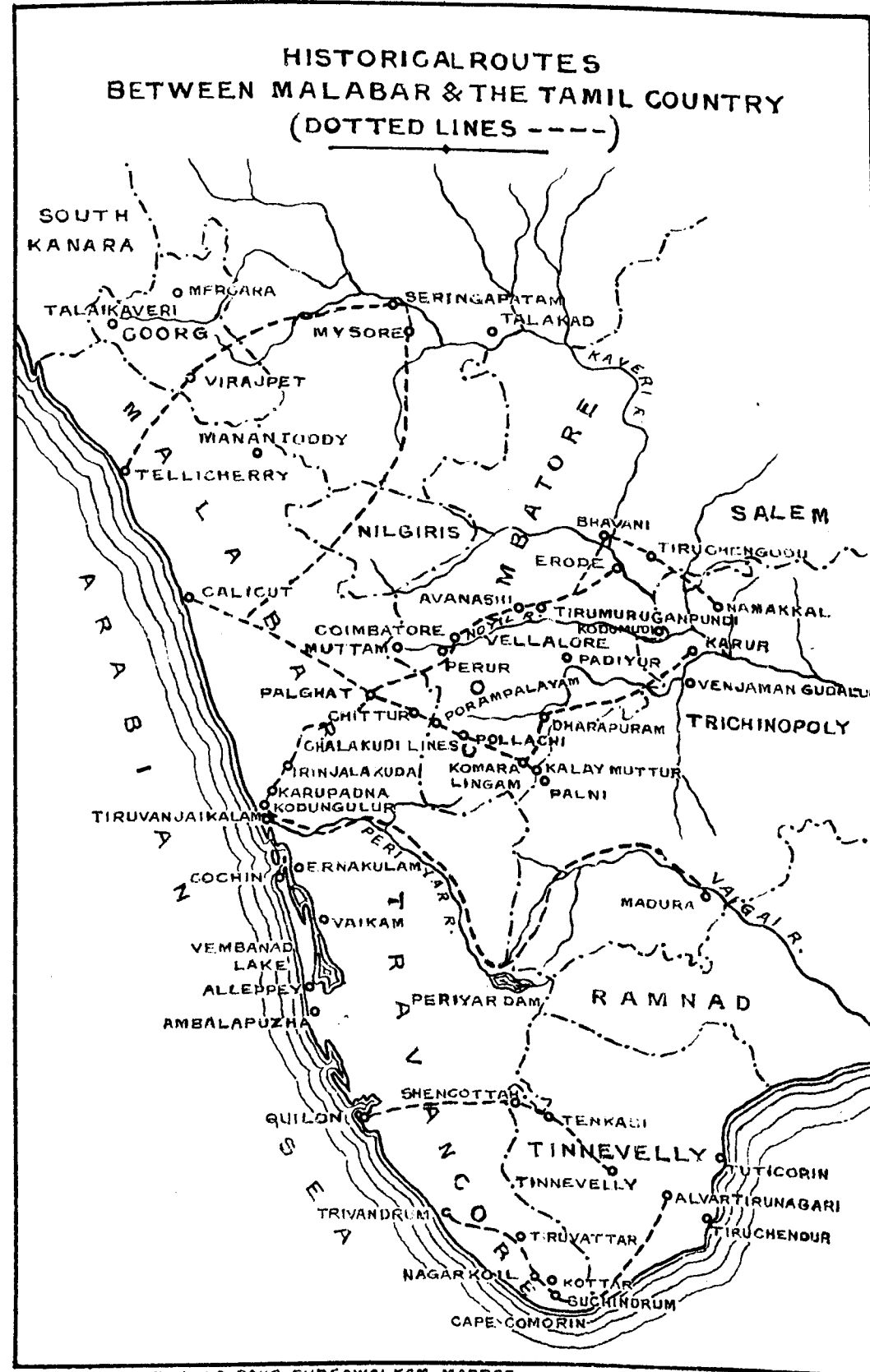
* * * * *
பெரும்படப்பு ராஜாக்களில் கோதகோரம் மரசரும்
ராமகோரம்மரசரும் வீரகோள நரசரும்கூடி ராஜ்யம்செய்தருளக்கண்ட
சித்தூர் மலையாளர்களும் படஞ்சீரி மலையாளர்களும் கூடி நம்முடைய
பிரதானி ஹிரணியமூர்த்தி பிள்ளைக்கு கொன்வரிகிறதென்று பாக்கு
பொதி, முளஹா பொதி, பட்டுபட்டா வெள்ளி பொதி, சீனிசர்க்கரை
பொதி, முத்து நவரத்ன பொதி, அத்தினையுமெல்லாம் அடித்து பறித்து
அடக்கி கொண்டார்கள். அதெப்படியோ மந்திரி பிராதினி. ஹிரணிய
மூர்த்தி பிள்ளை விசாரித்துக் கொண்டு

* * * * *
பெரும் டப்பில் நாலுரிலிலுள்ள மலையாள்களும் அந்த ஊர்களி
லுள்ள பிராதனிமார்களும் கூடி நம்முடைய மைவரக் காட்டவும் வேணும்;
அதுவுமல்லாவிட்டால் நம்முடைய ஓடமை பறித்த கள்ளர்களை கெட்டி
வரக்காட்டவும் வேணும்; அதுமல்லாவிட்டால் நாமும் நம்முடைய பிரா
தினிமார்களும் கூடி மணிமண்டப சாலையிலே சென்று கேள்பித்து, இந்த
வர்த்தமன மறியித்து, அவரும் அந்த பேச்சே கேட்டு கோவித்து, ஹிர
ணிய மூர்த்திபிள்ளை இதுக்கு விசாரமெப்படி யென்று, நாமும் நம்முடைய
செட்டி வெள்ளாளர்களுக்கு பலதடமும், பலதறயும் போருவும் வரவும்
வேணும் என்று கல்பித்து வழியே எட்டு லக்ஷம் படையும் ஆனையும்
குதிரையும் காலானோடு கூடி ஞாயிற்றுக் கிழமை நாள் மணவி

* * * * *
அந்த படிக்கு உடமகள்
பார்த்தலதே போரும்; உடமகள் பறித்த கள்ளர்களை கெட்டி வந்தா
லதே போரும்; பொன்கெட்டி வரக்காட்டினாலதே போரும் - அது
மல்லாவிட்டால் மறுநாள் திங்கள்கிழமை மேட்டு புறத்தலே செந்து
கட்டிச்சாத்தை அவித்து சாப்பிட்டு

* * * * *
தப்பாதே, என்னுணைமுலயரிந்து,
மூக்கரிந்து தலையரிந்து
சத்தியம் தான் சத்தியம் தான் வேலும் மயிலும் துணை, ”

FIG. II.



APPENDIX VIII

Specimen of Early Malayalam literature

1. கொண்ட லிங்கேருண்டு சுருண்டு
நீண்டொளி வார்த்து திங்ஙவும்
குந்தள பாரமோடு முகில்குலத்திட மிங்கல்போலே,
புண்டரீ கேயணந்நரி செப்பொலிந்தவன் லீதசொந்நான்.
—Kannassa Panikkar's Ramayana.
2. நூறுயிரம் கபி வீரம்மார் போகணம்
ஒரோதிகிபட நாயகந் மாறோடும்
நாகவாஸ்தலோ பரந்தே ஸஞ்சரிக்கும்போன்
நாகேந்து முகிலீத கண்டிவிஸ் மயம்புண்டான்
க்ருத்ர ராஜலுமொரு பத்ரவா நாயுள்ளொரு
ருத்ர ராஜனைப் போலே பத்தவைரத்தோடதி
க்ருத்த நாயகரே சென்று யுத்தவும் துடங்கினான்.
—துஞ்சத் தெழுந்தச்சிர்

APPENDIX IX.

Historical Routes (Dotted lines in the Map) between the
Chera country and the East

- I. **Kannagi**—2nd century (Via Periyar).
—Madura—Vaigai—Periyar—Kodungolur.
- II. **Roman trade routes**.—1st century to 3rd century (Via Palghat Gap).
—Musiri—Tondi—Palghat—Vellalore—Pollachi—Padiyur—
Karur.
- III. **Sundarar's visit**.—9th century (Via Palghat Gap).
—Tirumuruganpundi—Avanashi—Perur—Palghat—Tiruvan-
jaikalam.
- IV. **Sundarar's return**.—9th century (Via Palghat Gap).
—Tiruvanjaikalam—Palghat—Pollachi—Amaravathi river—
Karur.
- V. **Kerala inroads into Kongu**.—9th century (Via Palghat Gap).
1st inroad—Palghat—Perur—Coimbatore—Muttam—Vella-
lore—Avanashi...Erode—Namakkal.
- VI. 2nd inroad—Do. Do.
—Palghat—Pollachi—Komaralingam—Sangramanalore—
Palani.

- VII **Konguppada**—fight—9th century (Palghat Gap).
—Chittoor—Poravipalayam (Pollachi).
- VIII. **Alvar's Visits**.—9th and 10th centuries (Via Cape Gap).
—Alvartirunagari—Nanguneri — Nagerkoil — Tiruvattar —
Trivandrum and other Vaishnavite sacred places.
- IX. **Chola Occupation**.—9th to 12th centuries (Cape Gap).
—In Nagerkoil — Battle of Vilinam — Perhaps through
Tenkasi—Shenkottah pass—as there is inscription there also.
- X **Tippu's invasions**.— I. Seringapatam—Wynad—Palghat —
Chalakudi.
18th century. II. Seringapatam — Virajpet — Telli-
cherry.
III. Hasanur valley — Coimbatore —
Palghat.

A Geographical Survey of Early European Trade and Trade Centres in Malabar

By Mr. S. Natesan, M. A. (Hons), L. T.,

It is proposed in this paper to make a study of the early European trade and trade-centres of Malabar from a geographic point of view, keeping historical facts, as far as possible, in the background. In order to tackle the subject well, it is perhaps convenient to approach it from the standpoint of a student of modern commercial geography. The first thing that would strike him before going into the theme proper would be the complex commercial mechanism of modern times with ramifications covering the whole civilized world. The second thing to make a claim on his attention would be the keen competition there is among the leading trading nations to capture the raw materials of the world for purposes of manufacture. And the third but by no means the least factor that would impress him would be that in this race for commercial supremacy, it is the western world that holds the front rank although signs are not wanting to point to a commercial rejuvenation of the East. Be that as it may, he cannot dispute the fact that history hardly affords a parallel for the marvellous fabric of commercial life that our civilization has built up.

Travelling two or three centuries back, he comes to observe how there is a great contrast between modern and mediaeval commerce. In the Middle Ages and even later in the 16th and 17th centuries European countries were but feeling their way. It was a period when the west was getting to have a rosy vision of the East; reports of the fabulous wealth of India and China and of the Spice Islands tended to exercise a powerful spell on the adventurous nations of Europe. The beckoning vision of India as a land of Golden Fleece was ever floating before their eyes, only the way to reach her had to be found out. It was realised that a sea-route would be the safest and most convenient for the simple reason that hostilities had to be faced on land. The problem was solved with the happy event of the rounding of the Cape of Good

Hope by Bartholomew Diaz in the year 1487 A.D. The dreamy notions of the maritime people of Europe of an eastern 'Eldorado' seemed to come nearer realisation; and the earliest adventurer in the field was Portugal.

There is a certain aspect of mediaeval commerce which is of intense interest. It makes all the difference in the world between the commerce of old and the commerce of to-day. To the modern mind, it would appear strange that a few centuries ago, trade in a particular set of commodities known as spices should have engrossed all the attention and energy of the enterprising nations of Europe. But the explanation for this peculiar phenomenon is simple enough. Spices were in great demand at the time in almost all the countries along the higher latitudes of Europe since it was realised that spices, when mixed with food, have a wonderful preservative value, especially, in an age when the modern means of food-preservation were all but unknown. Hence the mediaeval race for spices available in such large quantities in India and the Eastern Archipelago. The outstanding fact, therefore, of commercial geography in the fifteenth, sixteenth and seventeenth centuries was not so much the desire to have a monopoly over the raw materials of the world as to have an exclusive control of trade in spices.

So far as India was concerned, Malabar was far-famed as a land of spices. The land of hills and dales had its own attractions for the maritime adventurers coming from Europe. She has among other things, an abundant supply of pepper, ginger, cardamoms, copra, cocoanut oil, coir yarn and fibre and a good number of drugs of great medicinal value. Facing the west, she was perhaps the earliest land of any size to be sighted by the western traders crossing the Arabian Sea by means of the Cape route. Possessing an extensive seaboard, with a narrow strip of land on one side and the lofty chain of Western Ghats on the east, with a landscape beautified by the rich and variegated glory of tropical flora, with dense forests of timber on the higher slopes of the hills and graceful groves of cocoanut trees fringing the coast, she must have been really a land of infinite charm to the traders sailing from the cooler latitudes of the west. The rivers of Malabar are such as to afford easy means of communication and transport between the sea on the one hand and the hilly country

on the other. She has an immense back-water system running closely parallel with the coast over a distance of hundred miles and more. Many of the rivers, swollen by the monsoon freshes, rush down from the lofty ghats behind and carrying everything before them lose themselves in lagoons or backwaters, prevented as they are by sandbanks from flowing into the sea. And these backwaters afford the easiest, and the cheapest and perhaps the only means of communication in a land where the laying of roads is such a difficult problem. Further the mud-banks of Malabar which are a unique feature of her coast are such as to give safe anchorage to ships when the monsoon winds blow hard. Truly Malabar should have presented an ideal picture of a place where trade and commerce could easily prosper. Essentially a land well-known for its spices, Malabar became naturally the scene of a regular conflict among the commercial rivals hailing from the west.

A close study of the important sites along the coast for which these European rivals contested would clearly bring out how geographical factors exert no small influence over the growth of trade and commerce. Much of the conflict of the traders of the west would appear to centre round the all-important question of the choice and ownership of suitable sites for factories and forts along the Malabar coast. For, so far as sea-borne trade is concerned, success depends to a great extent on the proper choice of sites for the building of factories and warehouses. A spot chosen should be such as to attract almost all the products of its hinterland. In this sense, Karachi is the natural outlet of the Indus valley and Calcutta of the valley of the Ganges.

The attempts of the early European traders to open trade-relations with Malabar reveal how they were guided by certain fundamental geographic considerations rather than purely political motives. Let us see how the Portuguese went about their business in realising their commercial aspirations and examine, at a later stage of our enquiry, if any noticeable departure was made by their successors.

To begin with, the earliest factories of the Portuguese were built at Cochin, Cannanore and Quilon. We shall consider why these places were chosen at the outset along the coast of Malabar. The situation of Cochin is unique. It is built on a narrow strip of land lying between the backwater and the sea to

the south of the mouth of the Cochin river. The Cochin river is the main outlet to the sea of an immense system of backwaters that run parallel with the coast from Cranganore to Trivandrum. By means of this wonderful chain of inland navigation, Cochin had not only smooth and safe access to the Ghats eastward and to the Carnatic but northward to the Goa territories and southward to Travancore and Cape Comorin. Cochin with its magnificent harbour was in every way superior as a port to Calicut where the Portuguese had made an earlier attempt to found a factory but failed owing to the hostility of the Zamorin. From historical records we learn that some of the finest vessels of the Portuguese and the Chinese were built in the spacious harbour of Cochin, the rich timber forests of Malabar being easy of access. Cochin, we are told, was the abode of many an expert ship-wright and carpenter. No wonder, Cochin was chosen as the headquarters of their trade on the coast of Malabar by the Portuguese.

Cannanore lies on a promontory jutting out into the sea. South of the promontory there is a curving bay. A factory at Quilon was opened with a view to capturing the pepper trade of Travancore. Cannanore and Quilon were chosen—one on the north and another on the south—just perhaps to extend the sphere of Portuguese trade on either side of Cochin.

The Portuguese traders would not remain content till they had captured Goa farther north. Goa is provided with a deep natural harbour affording easy communication with the kingdom of Vijayanagar with which the Portuguese opened up trade-relations. There are plenty of evidences bearing testimony to the large trade the Portuguese traders had with Vijayanagar in the days of her power and glory.

From historical accounts we learn that the Portuguese next set themselves to the task of building fortresses at Tangasseri, north of Quilon, at Cranganore, north of Cochin and at Beypore only six miles south of Calicut. Shrewd businessmen as they were, the Portuguese clearly saw that their trade centres would lack safety unless they could fortify them. That is evidently the reason for erecting these forts in close proximity to the factories originally founded by them. Beypore, of course, is an exception; it was chosen as the site of a fort not so much to protect any adjacent factory as to provide a bulwark against Calicut, the

stronghold of the Zamorin, the worst enemy of the Portuguese on the Malabar coastal region. Commanding the long reaches of the Beypore river, it served to cut in twain, as it were, the Zamorin's dominions. There are reasons to think that Beypore was, as it now is, the chief artery of the timber trade of Malabar; nevertheless, its importance as a military centre would appear to have been supreme. The Portuguese added to their fortresses one at the mouth of the Ponnani or the Bharatapuzha river. Although Ponnani is handicapped by a dangerous harbour, by shoals and sandbanks, it was chosen mainly with the idea of having one more centre of Portuguese power nearly midway between Cochin and Calicut. Its importance is mainly strategic.

Having thus entrenched themselves along the Malabar coast from Goa in the North to Quilon in the south, the Portuguese enjoyed a thriving trade in spices, drugs and the like in the East. But their monopoly of trade was only short-lived. One of the grand mistakes committed by them was to allow religion to vitiate commercial affairs. Trade in consequence, received a setback and the Dutch, a more enterprising commercial rival, easily stepped into their shoes about the close of the sixteenth century. Naturally all the trade centres of the Portuguese passed into the hands of their victorious rivals. It is worthy of note that the Dutch built no new factories elsewhere since the sites owned by their predecessors were the most eligible ones that could be had on the Malabar coast. All the vantage points had been selected by the Portuguese and it was quite an easy job for their successful rivals to build up a lucrative commerce with the East.

It was at this juncture that the English East India Company began to cross swords with the Dutch on the eastern waters. Ponnani was captured by the English while the Zamorin permitted them to trade at Calicut. Being late in the field, they could not choose sites for factories and forts as good as those of the Portuguese or the Dutch. Finally they fixed on Anjengo—a spit of sand with the sea on one side and a river on the other solely for the advantage afforded for trade by the river and its neighbouring creeks. Close on this, another factory was opened at Tellicherry in North Malabar—a picturesque town situated on a group of low-wooded hills running down to the sea and protected by a natural breakwater of basalt rocks. Otherwise they had no

other eligible sites to choose, the Dutch being already masters of the more eligible centres of trade.

In the early quarter of the eighteenth century, the French appeared on the scene. They opened a factory at Mayyazhi, four miles south of Tellicherry. It was christened Mahe after the Captain who captured it. On high ground rising from the sea and washed on the north by a little river, the entrance to which was blocked by rocks, Mahe seemed to be impregnable. Nevertheless, it was thrice captured and restored. Except Mahe, the French could boast of no other good site for a factory on the coast of Malabar. Slowly and steadily, the English seized all the Dutch factories and became undisputed masters of trade with Malabar leaving Mahe in the possession of the French. To the north of Mahe, the English built a factory at Tellicherry and to the south of it another at Badagara at the mouth of a river both being probably meant to act as checks on Mahe.

In this way we find how successive streams of European traders contended for the supremacy of the spice-trade of Malabar. Much of their trade was merely sea-borne, land-trade being a matter of subsidiary value. The wonderful net-work of waterways only served to help oceanic commerce in that they gave an easy access to and from the sea. That was the reason why most of the factories were built either at the mouths of rivers or at the confluence of rivers and backwaters. The erection of a factory was by no means a random or adventitious act but a deliberate and well-thought-out one based on certain fundamental geographical considerations. The desire of each European trading nation to get proper sites for factories on the coast reveals the amount of importance attached to convenient centres of trade. And once these trade-centres are set up, they tend to stabilise themselves although they change hands. It is noticeable, too, how a fort invariably goes with a factory obviously for purposes of safety. There are some interesting reflections emerging from a study of European trade operation in Malabar. It may be suggested, by way of conclusion, that an intensive geographical study of the history of the struggle for the possession of trade and trade-centres of the favoured lands of the world would lead one to the conclusion how geographical factors largely determine the trend of political affairs and mould the destinies of the commercial races of the world.

Some Place-Names of Malabar

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A critical study of the place-names of Malabar is, indeed, very interesting and affords a great opportunity for research scholars. In the term "Malabar" I propose to include not merely British Malabar, but the whole of Kerala which includes Cochin and Travancore, and which has, in common among its three political divisions, several topographical, social, historical and natural characteristics peculiar to itself.

The term 'Malayalam' indicates a land of hills and valleys, and almost every part of Kerala has these features well displayed. The legend of Parasurama having recovered Malabar from the sea may exist in the form of an interesting story for children. It may be a fact that at least certain portions of Malabar formed part of that once famous extensive Continent, the Continent of Lemuria. All those things apart, Malabar is certainly a land of distinctive physical features and natural conditions. This fact is sufficiently borne out by the place-names of the country.

Tamil being the language that once predominated in Malabar, both as a dialect and as a literary language, several place-names have suffixes similar to those that obtain in the Kongu Nadu. These names have been given to the places in Malabar for the same reasons for which they were given to the places in the Kongu country. The suffixes, **Oor** such as we find in Trissivaperur (Trichur), Kumaranellore and Nilampoor, **Palli** or **Pilli** such as we find in Edapilli, Nallepilli and Elapilli, **Pa'ayam** such as we find in Ampattupalayam and Thottipalayam, **Patti** such as we find in Erumappatti and Kalappatti, are all certainly Tamil in origin.

There are, of course, various place-names having suffixes peculiar to Malabar. **Thara**, **Kara** and **Thuruthu** or **Thuruthi** are suffixes that belong to this kind. **Thara** such as in Matakathara and Akathethara, means a soil that has been rendered hard for human habitation. In this connection, it will be interesting to remember the well-known story as given in *Keralolpathi* that

Malabar, when it was first recovered from the sea, was marshy, and that, on account of subsequent exertions, the soil was made hard and fit for man to live. The story also says that precious stones were freely used in the process of this soil-stabilisation, and that snakes began, therefore, to frequent the land and that snake-worship was instituted for propitiating these snakes.

Thara also means a plot of ground by the side of a hill or forest which has been properly levelled and made habitable. The Malabar villages, more especially those that are not by the sea-side, are mostly divided into *tharas* where the villagers live in groups.

Kara is a term that is indicative of the proximity of back-water or sea. In Travancore and in the southern part of the Cochin State, the sea runs into the land in several places in the form of lagoons and back-waters, and therefore, these *karas* abound in those parts. In the same manner as *Thara* indicates groups of houses in the Palghat and Valluvanad Taluks, *Kara* indicates particular parts of the land where people have gathered in large numbers. *Kara* also means areas of land by the side of hills or forests made habitable by very great human exertions. Many places ending in *Kara* in their names are far away from any remarkable water-area, and physical features of these places abundantly justified this assumption. Mavelikkara, Chottanikkara, Vadakara (Badagarai), Mullurcarai, etc., are examples of both the cases mentioned above.

Thuruthu or **Thuruthi** (island) is a term indicating the island-like or quasi island-like nature of the place. Example:—Ochenthuruthu and Gothuruthi. This term cannot be found in the Kongu Nadu for obvious reasons. Even in British Malabar they are rarely seen.

I shall just give a list of the common suffixes of place-names with explanatory notes for each of them.

Kodu.—A habitable area between hills or between back-waters lying in a zigzag manner. Example:—Chelakode, Azhikode.

Kulam (Tank).—A place which got its name on account of a tank extant or still existing. Place-names ending in *Kulam* might have also come from the tank-like plots of ground existing

in the country. Example:—Kunnamkulam, Kayamkulam, Ernakulam.

Ooru.—Although Malabar got this suffix from the Kongu Nadu, it is necessary to examine this term a little. In Vedic literature, *Uru* means a wide space. It is easy to admit that in conjunction with the other part of the name to which it is suffixed, it became Ooru (place) as is common with several combinations of place-names. Would it be unjustifiable, therefore, to conjecture that the Aryans who were highly advanced in the Vedic lore, when they settled themselves in wide open spaces in South India, began to add this suffix to place-names and that the suffix became so well current after that? At any rate place-names ending in *Ooru* are useful in one way. There is an old belief among the country folk of Malabar that whenever a person witnesses the falling of a meteorite (people call it the falling of a star!) he should mention 101 place-names ending in Ooru, and in this way many elderly people of Malabar are still able to repeat without any exertion whatever many such names. I may, in this connection, mention that in Tamil, *Oor* in the Imperative Mood means 'to go forward,' or 'to move.' In the course of the forward movement of people, some of them might have settled in different places on the way, and the suffix would have perhaps been given to the names of such places.

Thattu or **Thatta** means plain level ground, almost like a terrace. Example:—Chemmanthatta meaning 'red-soil-terrace.'

Kalam means field. It may also mean a fixed place. It might have come from a Malayalam word 'Kalakkal' meaning 'to dig up.' Example:—Porekalam (*Pore*-battle; *kalam*-field—battle-field).

Kadu means forest. The place would be one situated by the side of a forest or would have been once a forest land. Example:—Pulakkad, Karikkad, Kottukad, Palakkad (Palghat).

Cheri means a place where people congregated in large numbers. I doubt whether it would be wise to assert that places which have *cheri* as suffixes for their names were necessarily inhabited by the lower order of society. It is quite likely that *Cheri* came from Cheral which means 'joining together.' Example:—Wadakkancherry, Talasseri (Tellichery). I do not think that *cheri* and *Seri* are different.

Kara, Thara and Thuruthi have already been explained.

Malai means hill or mountain. Place-names ending in this were generally given to hilly tracts or very high regions. Example:—Thiruvillamala.

Puram is again another term indicating a town or city. Although this suffix is found even for places which have comparatively small number of inhabitants now, it is quite safe to state that in the past when the places got these suffixes for their names, they were comparatively better populated. Example:—Anandapuram, Thiruvananthapuram. I may here add that the term *Oor* is said, by some, to be derived from this word Puram. I do not concur with this view.

Kavu means temple of a goddess; but in some places the deity may be Shasta also. Example:—Mulakunnathukavu.

Pura or **Puram** side or back means 'by the side of.' Example:—Thirvegappura, Perampura, Pallippuram.

Puzha means river; but a place having a narrow stretch of wet land may also have this name. Example:—Vallapuzha, Elamkunnappuzha, Moovattupuzha (a place of three rivers), Arattupuzha.

Mangalam.—Several villages of the Palghat Taluk and a few villages in other parts of Kerala have names ending in Mangalam. Mangalam is said to be the shortened form of *chaturvedi mangalam* or the blessed abode of Brahmins well-versed in the four Vedas. It is further stated that these places were gifts made by ruling chiefs to such Brahmins. When we study the names of places in Malabar ending in *Mangalam*, we find it easy to concur with this view. We shall take for example, Thathamangalam, Rishinaramangalam, Desamangalam and Chennamangalam. Thathamangalam must have been Dathamangalam (gift and happy place) and it would then mean 'a happy place given as gift.' Rishinaramangalam would mean 'Sage Narada's happy abode.' Perhaps, this place was also a gift made to a venerable sage by name Narada. This Narada need not at all be the Narada of Puranic fame. These two *mangalams* have still large numbers of Brahmin houses. Desamangalam is a place where one of the noblest Namboodiri families still holds sway. Chennamangalam is the headquarter of a chief known as Paluyath Achan who was for a very long time the Prime Minister of the Cochin Rajas. There

are many Namboodiri Brahmins in the village. It is quite probable that this place was also a gift of the Cochin Raja to some Namboodiri Brahmins.

Tura represents an area where the river is fordable. It may also mean a portion of land adjacent to a backwater where some kind of transshipment takes place. Example:—Trippunithura.

Kadavu means a fordable portion of a river or a back-water. Example:—Kandassankadavu.

Chira means a tank or a large area of wet land where water could be stored, if necessary, for purposes of irrigation. Example:—Vallachira.

Vattam.—Places having this suffix for their names have large areas of land well-shaped and circular. Example:—Champravattam, Vallivattam.

Padam indicates cultivated land. Places having this suffix for their names will have extensive areas of cultivated lands. Example:—Varadanpadam, Manappadam, Karimpadam.

Vai means mouth or opening. This mouth or opening may be that of a river or cultivated wet land. If it is the latter, it will generally be an opening through hilly ranges.

Palli, Palayam and Pathi mean in Malabar exactly what they mean in the Kongu Nadu, viz., pastoral land, place of encampment and land occupied by certain peculiar tribes, respectively. Example:—Nalleppilli; Edapilli: Ampattupalayam; Eru-thempathi. These suffixes are mostly seen in the Palghat Taluk on account of its greater proximity to the Kongu Nadu. Palli must have come from the Tamil word *pallam* meaning a deep land or valley. Valleys must have been used in the past mostly for cattle-feeding and, therefore, the suffix came to mean a pastoral land.

Kudi.—This suffix as in Chalakkudi and Eriyankudi merely indicates a place formerly occupied by the poorer inhabitants of the land.

There are several other suffixes also which are peculiar to the place-names of this country; but as they are only one or two in

each class, I do not think I shall be justified in detailing them here.

I may now be permitted to make a classification of the place-names not according to the particular taluks in which they are seen, but according to the circumstances which made these suffixes possible and necessary.

The first division is topographical. The place-names of this class will clearly indicate how the names were obtained. On account of the peculiar topography which attracted the attention of the settler, he gave the place a name which came to him quite in the nature of things. Tanur, Mannarghat, Karivarukundu, Cochin, are all names that tell us what the topography would be. Tanur means a low-lying land, Mannarakad a place having muddy river and forest, and Karivarukundu, a deep land of blacksmiths. It is said that in the last named place iron extraction in a very crude form was being done by black-smiths a long time back. Cochin is in Malayalam 'Cochu' only, and I venture to suggest that the name would have been formerly "Cochu" meaning small. Due to the small area of the place, this name might have been given to it. Of course, the local interpretation is that it is the corrupted form of *Gosree* meaning the land of the King of Cochin who is known as Matabhoopan (King of the Mata country, another name for Cochin). I am sure my suggestion will meet with a storm of protest inasmuch as it stands against the accepted idea.

The physical conditions that exist in the place such as the proximity to rivers, mountains, extensive cultivated lands, &c., also contribute to the nomenclature of places. Mulloorkarai, Alwaye, Arattupuzha, Ponnani, Kadalundi, Vaippu, Karimpuzha, Tirur, Triprayar, are instances, of the kind. Mullurcarai is a place adjacent to forest lands once having large *mullu* (bamboo) trees in them. Alwaye indicates clearly the proximity to the mouth of the famous Alwaye river. Anybody who happens to visit Arattupuzha, situated some eight miles to the south of Trichur, would easily admit that it is on account of its extensive fields that the place got its name. In regard to Ponnani, I seriously doubt whether it is not Pon-Anai (Gold + embankment). *Anai* means embankment, and it may be that once in the past gold was being

taken from the sands of the Ponnani river. Kadalundi is certainly Kadalundu or Kadalunthi *i.e.*, the sea entered into the land and ate up a portion of it, or the sea forced itself into the land, respectively. Vaippu is nothing other than Karaivaippu (Farming land), *i.e.*, land subsequently formed on account of the sea seceding. Karimpuzha indicates the proximity to a river having black water or black sand. Tirur is, I suppose, Tiriyoore (turning place) *i.e.*, a place wherefrom several diversions of routes take place. I put forward this suggestion because there is no great temple in the place to enable us to interpret it to mean a 'holy place.' Of course, there is the famous Trikkandiyoore temple close to Tirur, and we cannot definitely say whether the place-name 'Tirur' does indicate the proximity to that place of holy temple. Triprayar is, according to traditions of the place, "Thirupuzhayar," (*Thirup* = direction turned; *puzha* = river; *aar* = river), *i.e.*, a river which has changed its direction. I have recently carefully examined the place and I find that the tradition is completely justifiable. There is a long narrow stretch of wet land on the other side of the temple, and it seems to me to be quite probable that the river would have taken its present route only on account of a diversion of its course. It may also be noted that in *Keralolpathi*, the river flowing by the front portion of the temple is termed as "Theevra Nadi" which may mean a river that runs very quickly. But the river as it runs at present does not justify this term. It has apparently only a slow motion. It is interesting to note, in this connection, that *puzha* and *aar*, both meaning river, happen to occur in the same name. But such instances of place-names are not at all rare, for example, Moovattupuzha.

Artificial conditions also give names to places. We shall take a few place-names of this kind and examine them. Kunnamkulam has a tank which necessarily attracts the attention of any casual visitor and it may not, therefore, be wrong if we state that the place got its name on account of this tank. Ernakulam (said to be a contraction of Rishinaradakulam) is another instance of the kind. Theekkodi (Flag of Fire) is another typical example. It is exactly because of the location of the light-house that the place has got its name.

Nature of the soil and products has caused place-names to come into existence. Manappadam, Mankarai, Athipotta, Thichoor

Varadanpadam and Palakkad (Palghat) easily prove our case. Manapadam means 'sandy field': Mankarai is 'Man' plus *karai* (Mud + land) Athipotta means an area where dry-land cultivation is carried on. Thichoor is, I believe, Thechi + Oor (Land of Thechi plant). I have noticed in this place a lot of *thetchi*, a plant yielding a kind of beautiful flower. Varadanpadam means 'sandy field.' Palakkad (Palghat) means a place which has forest lands adjacent to it containing lot of *pala* trees.

People gathering together in any particular spot at certain periods is also indicated by the place-names. Wadakkanchery and Talachery (Tellichery) indicate that people gathered in ranks in those places. The name Varavoor (a village in the Cochin State) indicates a place to which migration was taking place for some length of time together. Contrary to this, we find a place called Elanad (dishonoured land) which means a land that was abandoned is course of time. Elanad may also mean 'Elayanad,' i.e., a smaller land.

The presence of notable temples has played a very important part in settling place-names not only in Kerala but also in various other parts of our country. Thiruvananthapuram, Trissivaperur (Trichur), Gurupavanapuram (Guruvayoor), Trikkakara, Sreekrishnapuram and Lokamaleswaram are all examples to illustrate our point.

Many place-names indicate a lot of hidden history and afford us opportunities for a good deal of research work. I shall just take three places belonging to three distant parts of Malabar. We have within the Palghat Municipality a village called Sekhari-puram. It is said that one of the Palghat Rajas by name Sekharivarman gave this place as a gift to the Brahmin settlers and, therefore, the place was named after him. Tali is another place-name which is noteworthy. It is supposed to be the place of residence of military commanders or rulers called *Taliyadiri*es who were under the Zamorin. "Kozhikode" (Calicut) has some funny little story to tell us. It seems that the Chera Ruler, "Cheraman Perumal," gave his children as much land as would be within an area where the crowing of a cock could be heard; but this seems to be too silly to be seriously noticed. It will be worth while to ascertain whether this name is in any manner associated with a copper coin known in Malayalam *Kozhikkasu*,

in which case this will have to be brought under another class. A small hillock situated in the southern part of the Municipality of Calicut is known as *Kokkozhikodekunnu* (The hill on which the cock crowed) and there is also an old family name called *Kozhipuram* within the town itself. When these two names are also taken into consideration, perhaps the former theory may have some semblance of weight.

I may be permitted to take one more example under the foregoing category. The term *Vellattukara* means *Vallabhanattukara*, i.e., a land ruled over by Vallabha Raja. This again indicates historical association. Lest this paper may become unusually long I do not propose to take more names of this order.

Ancient military strongholds and places of encampment have found names of their own to justify their tradition. Kottakkal, Mathilakam, Kottapadi, Porekalam, Ampattupalayam and Thottip-palayam illustrate our case. Anyone who has just paid a visit to Kottakkal, more than ten miles to the north of Tirur, would unhesitatingly admit that this place-name has been derived only on account of the excellent fort over which at present a branch of the Zamorin Maharaja's family has its residential buildings.

Places that were once occupied by cultured and religious men have left traces of their past glory in the names that they possess at present. Most of the villages that have *mangalam* to end their name were once the seats of Brahmins well versed in the Vedas. A good deal has already been expressed about this, and I shall not be right in dilating upon this any further. But, in regard to a village called Kallapatti, I have a serious doubt whether it was not once a seat of great learning and whether the name does not indicate that. It is quite likely that the name is Kalapatti (Place of learning) and not Kalappatti (Kalam or Farm-house + pathi or enclosure), in which case *kala* signifies learning. Even now, this village has several learned people. Kalapatti may also mean a farm-house, with temporary ramparts made of bamboo.

Some places are said to have derived their names on account of their association with some Puranic person or incident. Such names are very few in Malabar. In the Chirakkal Taluk there is

a place called Velam which is said to be the contraction of *Bakakalam* meaning the *kalam* (field) of the demon, Baka, i.e., the battle-field of Baka and the place from which Baka was killed by Bhimasena. *Ekachakranagari* was the place where the demon held sway. There are ruins of many ancient buildings in this place (Velam), and therefore, the story about the place-name has some justification to stand.

There is a place called Kannapuram, ten miles north of Cannanore, where there is a railway station now of the same name. It is said that the place-name was Kanvaparam (the place of Kanva) and that the great sage Kanva was practising penance in that place. There is also a room carved out of the rock in this very place which certainly appears to have been used by some ancient sage. It may not, perhaps, be correct to say that the Kanva of Sākunthala fame practised penance there.

Certainly these stories may be considered to be very incredible; all the same, it must make us think whether there may not be place-names in Malabar which indicate Puranic association of some kind also.

Place-names indicate trade centres as well as the profession of the people who once occupied the land. Vāniyankulam, Vandithavalam and Sultanpetta belong to the former class, and Nairampalam (Temple of the Nairs) and Valapad to the latter. The name Valapad (*Valai*=net), to my mind, appears to show a place formerly inhabited by fishermen, and even now the village has a large number of fishing folk.

Then, there is another important factor which has contributed to the making of place-names, I mean the accidental phenomena. Simply because a place had, once in the past, a big banyan tree, a small bridge or a water-shed, it would have obtained its name, and even after the entire destruction of the phenomenon, the name would have continued. The inhabitants might entirely forget how the place derived its name. Instances of this kind are innumerable. We shall just take the case of Ottappalam and try to prove our point. On our way to this place from the east just through the public road, on the eastern border, there is now a well-constructed bridge for a small stream that joins the Bharatha

river. Exactly to the east of this bridge the village is called Palappuram, i.e., the land on the other side of the *palam* (bridge). I believe a single wooden bridge would have been used in ancient days for crossing this streamlet, and the place which was reached after crossing the bridge due west would have been called Ottappalam, the corresponding eastern side being called Palappuram. I am only just making some effort to find out an explanation for this place-name and to suggest that place-names would have been derived in this manner also.

In all the things I have thus far said I have only made some very humble attempts to enable us to think further on the topic and to seek the assistance of scholars to solve the problems connected with the place-names of Kerala.

Roman Trade Centres on the Malabar Coast

BY Prof. P. J. THOMAS, M. A., B. LITT., Ph. D.

I

Malabar was the premier entrepot of Roman trade in the East, and no part of India was better known to the Romans than the Malabar Coast. This was due partly to the existence of rare commodities in Malabar, and partly to the direction of the monsoon winds which in those days decided the course of navigation. The pepper, teak and ivory, and possibly also the beryl, ginger and cardamom of Malabar, have always been known to the commercial nations of the world, and there is evidence going back to 3000 B. C. that some of these rare products of Malabar had found their way to Babylon and Egypt, in China and Tartary. The Phoenicians were perhaps the first to control the spice trade of Malabar; next came the Romans, and under them the trade received great encouragement and expanded considerably.

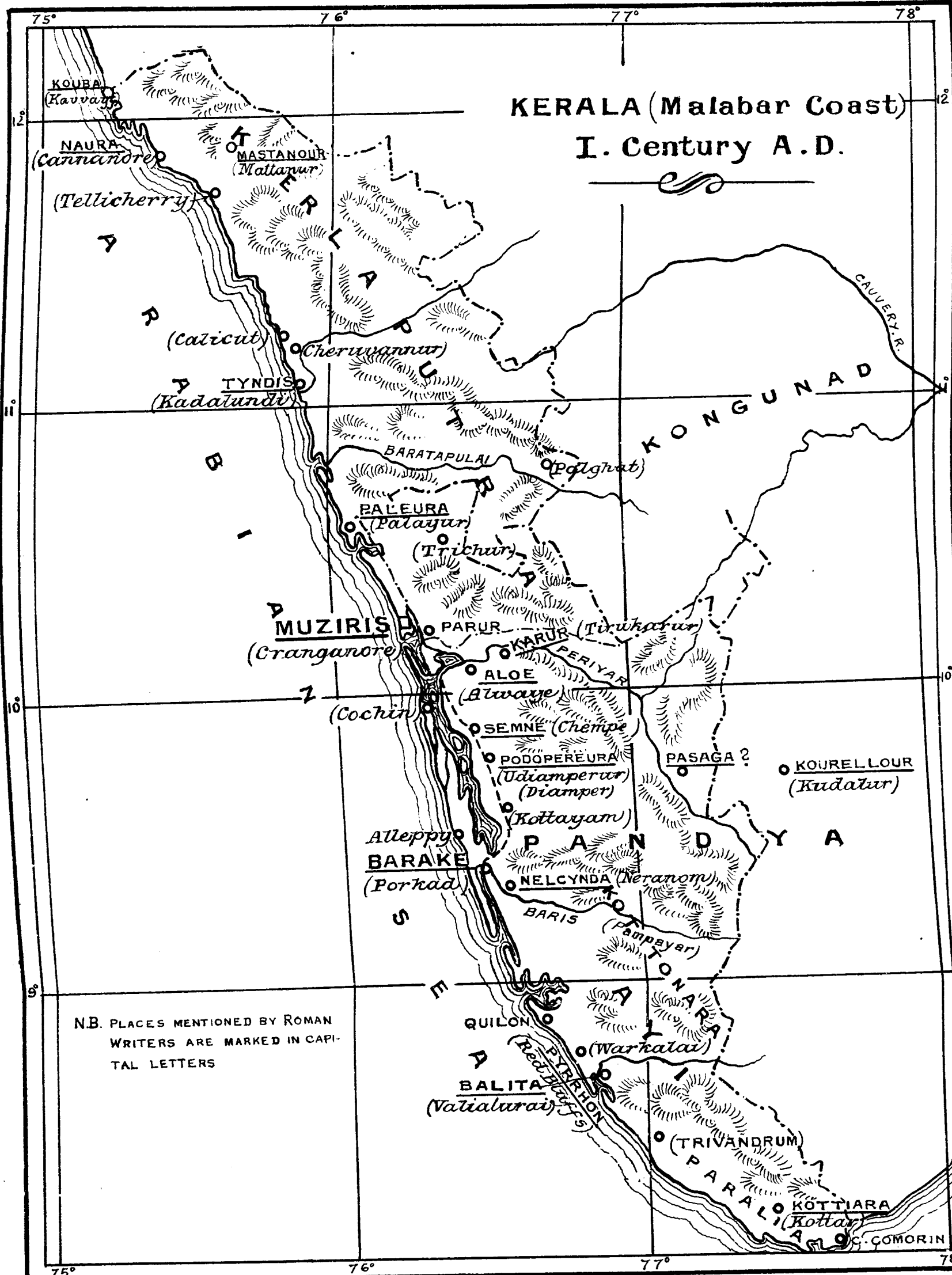
In the early days this trade with the western nations was carried on along the coasts of Arabian Sea, reaching the Mediterranean either through the Red Sea or through the Persian Gulf and thence by land. This was a circuitous route; it took a long time and the dangers of travel were great. But sometime about the middle of the 1st century (possibly 47 A. D.), a daring navigator called Hippalus discovered that by taking advantage of the monsoon winds, ships could sail straight across the ocean and reach India from the Red Sea ports in 40 days. This seems to have been known to the South Indian and Arab sailors; but they seem to have jealously guarded it as a secret.¹ To the Romans, therefore, the discovery of Hippalus marked a new era, and the wind itself came to be called 'Hippalus'.² The importance of this discovery and the fillip it gave to Roman trade is set forth in contemporary Roman writings.³ It gave to Rome the control of the Indian trade and made her the leading commercial nation of the world. The direction of the wind led the ships straight to the Malabar Coast, and Muziris (now Cranganore) was the first port touched in India. Ships would sail in July from Cape Guardafui and by throwing the ship's head off the wind with a constant pull on the rudder and a

1. See J. R. A. S., 1898, pp. 248—87.

2. Periplus (Ed. Schoff) p. 45 (sec. 57.)

3. Periplus, *Ibid* and p. 227—230; Pliny, *Natural History*, VI, 26.

FIG. 12



LITHO: BY P. N. N & SONS, PURASAWALKAM, MADRAS.

shift of the yard, Muziris was reached in 40 days¹. Pliny calls Muziris 'the nearest mart in India'. Those who wanted to go to other parts of India would then continue their journey by coastal vessels or by land route. The ships would then take cargo and would sail back to the Red Sea mouth in December when the north-east monsoon set in.

It was thus that Malabar became the chief scene of Roman trade activity in the East. Pliny's 'Natural History' and the *Periplus Maris Aethiopiae*, by an unknown author, contain a fairly detailed account of Malabar ports, and in Ptolemy (who wrote his 'Geography' in 150 A.D.) the account is much fuller. Not only ports but inland towns are mentioned and their distance from one another is roughly indicated.

Pepper was the staple commodity of the Roman trade, and formed the great bulk of the cargo of Roman ships. Further, all the pepper available for trade at the time came from Malabar. Pepper was from ancient times an important culinary spice in Europe and was used to season food and preserve meat. It was also an unavoidable ingredient of medicines, and was prescribed by Hippocrates (who calls it the "Indian remedy") and by Galen, Pliny, Celsus and other writers who deal with medicine.² In Rome, the use of pepper seems to have become very popular from the time of Augustus and according to Pliny (XII, 14) its price was as high as 15 *denarii* (about Rs. 7) per pound. Even higher price have been quoted. The price in India was not more than half that sum and the profits realised was therefore as high as 100 per cent. according to Pliny³ After the discovery of the monsoons and the consequent facilitation of transport the price of pepper seems to have fallen but this made its demand elastic and such vast quantities had to be imported that about the year 192 A.D. special warehouses called *horrea piperataria* were erected near the Sacra-Via. It was ground in pepper mills (*molae piperatariae*), or mortars, and sold in paper packets in Campus Martius and other market places. The pots or dishes (often of silver) in which pepper was brought to the table was called 'piperatoria.'⁴ Pliny attacked the atrocious tastes of those who needed pepper to whet their appetites. "It is quite surprising that the use of pepper has come so much into fashion, seeing that it is sometimes their substance and sometimes their appearance that has attracted our notice; whereas, pepper has nothing in it that can plead as a recommendation to either fruit or berry, its only desirable quality being a certain pungency; and yet it is for this that we import it all the way from India! Who was the first to make trial of it as an article of food? And who, I wonder, was the man that was

1. Pliny, VI, 26

2. Warmington, *Roman Trade with India*, p. 181—88

Schoff, *Periplus*, p. 213—15.

3. Nat. Hist. VI, 101

4. Warmington, *op. cit.* p. 183, 803.

not content to prepare for himself by hunger only for the satisfying of a greedy appetite." (XII. 14). In spite of such strictures the import trade in pepper grew immensely and vast profits were made by merchants. In 408, when Alaric, the Goth, laid siege to Rome, the terms he offered for raising the siege included the immediate payment of 3000 pounds of pepper along with other similar valuables¹.

Although the pepper trade brought vast profits to individual Romans, its effect on public finance was ruinous. While exporting valuable commodities, India imported very little from Rome, and therefore the trade with India led to a drain of gold and specie. Malabar, in particular, had plenty of valuable commodities to export, but needed little in return. In result, gold and silver coin had to be shipped off to Malabar to pay for imports to Rome. In this way, a vast quantity of Roman coins came into India and this country came to be regarded as the 'sink of precious metals.' Of the several thousand coins that have been discovered in India, the greater part was found on the Malabar coast and the adjoining districts of Coimbatore and Madura. They are mostly of the reigns of Augustus, Tiberius, Gaius and Claudius. The Tamil poems of the time also bear testimony to the importation of gold to Malabar ports. In *Akananuru* a work written in the first or second century A. D., it is stated that 'the Yavanas came in large vessels carrying gold and returned with pepper.'²

“யவனர் வனத் வினைம, மாணன் கலம்
பொன்னொடு வந்துகரியொடு பேயநும்.”

II

The principal centres of Roman trade in Malabar were Muziris, Tyndis, Barake (or Bakare) and Neleynda. Besides these, several inland towns and minor places are also mentioned by the Geographer Ptolemy (c. 150 A. D.) whose knowledge of Malabar was rather detailed for a foreign writer of the time.

Muziris, called Muchiri in Tamil and Muyirikodu in Malayalam, was the capital of the Chera kingdom in ancient days³. It was

1. Schoff, *Periplus*, p. 214.

2. There are also similar passages in *Purananuru*, a contemporary work. See Kanakasabai Pillai, *Tamils 1800 years ago*.

3. In early Tamil works the capital of the Chera kings is also called 'Vanji'. Possibly these were all parts of the same city, and Muchiri must have been the port adjoining the capital. 'Karur' occurs in the name Karupadanai, a village near Cranganore and Makodai is mentioned in certain ancient poetic writings and in *op. cit.* pp. 59 & 114, identifies 'Karoura' with Parur, a town adjoining Cranganore on the other side of the river, but this identification is not convincing.

formerly identified with Mangalore, but the mistake became soon clear and Burnell identified it with Modern Cranganore. It is located at the mouth of the river Periyar (Alwaye River) and is therefore easily accessible to inland traders. Muchiri is mentioned as a great port in early Tamil literature; it must have been the trading centre of Phoenicians and Arabs in the past. But it was during the Roman connection that Muchiri reached the zenith of its fame. The discovery of the monsoons by Hippalus made it the gate of India, the first and foremost port of call for trading vessels from Alexandria and Arabia, from China and Siam. According to all accounts it was an extremely busy place, with a harbour crowded with ships and craft of all kinds, with large warehouses and bazaars adjoining it and with stately palaces and places of worship in the interior. There the native traders came by river with their cargo in vallams (country boats) and emptied it into the large and spacious Yavana ships and Chinese junks. The merchandise taken at Muziris consisted of pepper in large quantities, malabathrum, beryl, pearls, ivory, silk cloth, spikenard, diamonds, sapphires and tortoise-shell. What malabathrum exactly was there is still some doubt. Earlier writers like Heeren, Vincent and McCrindle, translated the word into betel, but more recent writers like Schoff and Warmington think that it was the leaf of the cinnamon tree.¹ (Tamala-patra, *sans.*) Ginger in those days was exported chiefly from Ceylon and does not figure definitely among the exports from Malabar. Pearls must have come from around Cape Comorin; ivory has always been a distinct Malabar produce, and tortoise-shell was also common. The other commodities must have come from the interior of the Peninsula. Beryl perhaps existed in Malabar, but it chiefly came from Salem and Coimbatore.²

The merchandise imported consisted of Roman coin in large quantities, topaz, thin clothing, figured linens, antimony, coral, crude glass, copper, tin, lead, wine, realgar and orpiment³. Wheat was also imported but only in small quantities for the use of sailors. The bazaars of Cranganore must have been like those of Colombo and Cairo in modern times abounding in all kinds of luxury goods, strange beverages and curious trinkets. Contemporary Tamil poems speak of "the cool and fragrant wine brought by the Yavanas in their good ships," and

1. Schoff, *Periplus*, pp. 218-19; Warmington, *op. cit.* p. 186. cinnamon seems to have been then a trade monopoly of the Somalis of African Coast, and it is not mentioned as an article of import by Roman writers. This must have been a trade secret of the Somalis.

2. Charlesworth, *Trade Routes and Commerce of the Roman Empire*, (1924) states that the beryl mines of Cranganore were famous. (p. 69). This statement is not supported by facts. Most of the beryl exported from Cranganore must have come from Coimbatore and the Nilgiris which were then apparently under the Chera sway.

3. *Periplus*, para 56.

refer to the drinking bouts of kings. Among the imports at Barygaza (Broach), mention is made by *Periplus* of singing boys and pretty maidens for the harem, and although no such wares are mentioned in the same work among the imports to Malabar, there are indications that Malabar too had a share of such trade. Nor were the Romans mere travelling pedlars, but powerful merchants with the military power at the back: and so important had Malabar trade become to Rome and so prominent a resort of Romans had Muziris become that, according to Ptolemy's Table, a Roman temple dedicated to Augustus existed in that city and two Roman cohorts were stationed there to guard the warehouse.¹ This is not supported by other evidence, but we have a statement in a contemporary Tamil poem that there were Yavana soldiers and mercenaries in the service of the Chera king and that they struck terror into the hearts of the beholder by their stern looks.

Muziris was then and even subsequently a centre of non-vedic religions. The Tamil literature speaks of the Buddhist viharas and Jain chaithyas there; there stood also the celebrated shrine of Kaannaki whose story is related in Chilappadikaram and Manimekhalai. Jews and Arabs and Persians had settled down at Muziris for trade purposes and each such colony occupied a separate quarter of the town. In 50 A. D. the Apostle Thomas is believed to have landed at Maliankara, adjoining Muziris, and Syrian Christians still regard it as a sacred spot. He is also believed to have converted a Chera king, possibly Palli-Banaver, of whom there is some account in Keralolpathi. In 345, the Syrian merchant chieftain, Thomas Knayi (Thomas of Cana) is believed to have landed there with 500 colonists and possibly these were the Persian colonists of Malabar spoken of by Cosmas in the 6th century A.D. The Christian headquarters was Makodai, close to the Cheraman palace, and nearly every Syrian Christian family north of Tiruvalla traces its lineage from Makodaipattinam. After the Romans withdrew, these Syrian colonists shared with Jews the foreign trade of Muziris and they were responsible for the customs dues of the king. Tradition says that sometime after the 9th century, the Arabs set fire to Makodai and that the Christians let it and made Angamali (near Kaladi) the headquarters of the community. The great flood of 1341 seems to have changed the course of trade as well as of rivers. It opened a passage from the Cochin backwater to the sea and made the land-locked town of Cochin one of the finest harbours in India. It was also in that year that the Vaipin island was formed and the era of Puduvaippu starts from 1341.² Cranganore, already decaying, was

1. Warrington, *op cit.* p. 58. Charlesworth, *op cit.* p. 70.
2. See *Indian Antiquary* (1902) p. 339.

soon superseded by Cochin and Calicut, which subsequently became the premier trade centres of Malabar.

III

To the north of Muziris, the principal ports mentioned by Ptolemy (150 A. D.) are Naura and Tyndis. According to Schoff, Naura is modern Cannanore. Tyndis has been identified with Kadalundi near Beypore¹. As inland towns are mentioned Naroulla, Kouba and Paloura. Of these Paloura must be Palayur, in South Malabar, where a Jewish colony and a Syrian church existed from ancient times. It seems to have been also a celebrated Brahmin centre in by-gone days, Kouba has been identified with Goa, but it might as well be Kavvaye, 10 miles north of Cannanore.

To the south of Muziris, the principal centres of trade were Barake (Bakare) and Nelcynda, which were both on the river Baris. Between the Periar and Baris rivers, a few inland towns are mentioned by Ptolemy—*Passage, Mastanour, Kourellour, Pounnata, Aloe, Karura, Arembour, Bideris, Pantipolis, Adarima* and *Koreour*. As coastal towns are mentioned Podoperoura and Semne. It is difficult to identify these towns, especially as Ptolemy's map is very defective. Passage may be Puzake, a town in the hilly regions of North Travancore. Mastanour may be Mattanur in North Malabar, and by mistake mentioned as having been in the south. Kourellour may be Kudallur, a town in the Cumbum Valley (Madura District) in the vicinity of Travancore. Pounnata may be Poonjat (Poonjar) the seat of a chieftain who was formerly a tributary of the Pandya king. According to some, it was a town in Mysore, but the chief reason for this identification is that Beryl, which is associated with that town, existed chiefly in those parts². Aloe is doubtless Alwaye, the celebrated bathing resort on the Periar which was well-known formerly for a Siva shrine. Karura is marked as the royal seat of the Cheraputras, and is located on the Periar river. This is quite probably Tirukarur, in North Travancore, where the early Cheramans had their interior capital. It is believed that there were Buddhist and Jain viharas there and that the Tamil work, Chilappadikaram, was written there. Kanakasabhai Pillai was the first to make this identification and his line of reasoning in this matter is convincing³. Adarima may be Adirampuzhai, near Kottayam, an ancient market place. Koreour may be Kothora near Vaikam, or Karur, the well-known town of that name on the Amaravati river in Coimbatore district. Podoperoura and Semne seem to have been Udiyampurur (the Diampur of the Portuguese) and Chempe, two towns of historical importance

1. Ptolemy's Geography (Ed. McCrindle) p. 50.

2. Warrington, *op cit.* p. 113.

3. Kanagasabai, *Tamils 18 Hundred years ago*; also I. A. 1903, p. 813-14.

South of Ernakulam. They were both centres of trade and had flourishing Syrian Christian settlements from ancient times.

Baris is evidently the river Pampa (or Pampayar), which flows across the region formerly celebrated for pepper. That river and the country south of it seem to have been in the kingdom of Pandya in Roman times. Pliny (50-60 A.D.), the author of the *Periplus* (60 to 75 A.D.) and Ptolemy (150 A.D.) agree in this view. When Ptolemy wrote, however, the power of the Pandyas seems to have been waning and the Ayi (the earliest ruling dynasty of Travancore) seem to have dominated the country extending from Baris down to Cape Comorin. Possibly between 60 and 150 A.D. the Ayi Chieftains had established their power and had become independent of Pandyas, whose capital was Madura¹.

Barake (Bakare)² was a port at the mouth of river Baris (Pambayar) and Nelcynda was an inland city on the river. At the time of Pliny (50 to 60 A.D.) Barake was apparently a more convenient port than Muziris. He says: "This (Muziris), however, is not a very desirable place for disembarkation, on account of the pirates who frequent its vicinity, where they occupy a place called Nitrias;³ nor in fact, is it very rich in articles of merchandise. Besides, the roadstead for shipping is a considerable distance from the shore, and the cargoes have to be conveyed in boats, either for loading or for discharging. At the moment that I am writing these pages, the name of the king of this place is Caelobothras.⁴ Another port and a much more convenient one, is that which lies in the territory of the people called Neacyndi, Barake by name.⁵ Here king Pandian used to reign, dwelling at a considerable distance from the mart in the interior, at a city known as Modiera. The district from which pepper is carried down to Barake in boats, hollowed out of a single tree, is known as Kottonara. None of these names of nations, ports and cities are to be found in any of the former writers, from which circumstance it would appear, that the localities have since changed their names." *Periplus*, which must have been written after Pliny, does not agree with this state-

1. *Periplus* (ed. Schoff) para 54 (p. 44); Pliny op. cit. VI 26; Ptolemy (ed. McCrindle), *Kanakasabha, Tamils Years Ago*, passim; Warmington, op. cit. 59, 114.

2. Pliny gives it as Barake, and Pliny has given fuller detail of the place than any other writer (VI-26.)

3. Almost all early travellers speak of pirates on the Malabar coast. *Periplus* speaks of pirates, just to the north of Tyndis (page 53). Pliny, too, says they were near Muziris; and Ptolemy calls Malabar the land of pirates. This is confirmed by Marco Polo (III Chaps. 24, 25). This simply testifies to the existence of native shipping at the time, and to the fact that all ports were not regarded open to foreigners.

4. Keralaputra; curiously enough the same name is used in Asokan edicts. That was not the name of the particular king but the common family name. Pliny did not know of the custom among eastern kings to have a common surname. Pandian is equally common.

5. Pampa was wide and deep, and apparently supplied excellent anchorage.

ment. It clearly states that Muziris was the principal port and calls Barake a village, on the mouth of Baris, where ships laden with pepper from Nelcynda "drop down", because the river was 'full of shoals and the channels were not clear'. "And as a sign to those approaching this place from the sea, there are serpents coming forth to meet you, black in colour, but shorter, like snakes in the head, and with blood red eyes."¹ Evidently therefore, Muziris had then the bulk of the pepper trade.

By Ptolemy's time, Barake and Nelcynda seem to have ceased to be legal marts. In his map, Barake is marked in the territory of Cheraputra and Nelcynda in the Ayi region. It must have been due partly to the withdrawal of Pandyan patronage, and possibly also to the deliberate suppression of those marts by the Cheras who were interested in giving the monopoly to Muziris. At any rate, the result was that for a long time afterwards and till the foundation of a port at Kollam (Quilon) in the 9th century, Muziris had no serious rival on the West Coast. But this ceased in 1341, as mentioned above.

The question of identifying Barake and Nelcynda has exercised the imagination of several scholars. Yule identifies Nelcynda with Kallada, an otherwise unknown village in Travancore. Kanakasabha Pillai identified Baris with Meenachil river and Barake (Bakare) with Vaikkarai, near Kottayam, and as for Nelcynda (Neacindi) he found a little known interior village called Nirkunnam in Minachil. Vincent Smith approved of Kanakasabha's identification and popularized it among historical writers. But all this was the work of people who knew little of the history and topography of Malabar. The Meenachil river was hardly ever navigable except during the monsoon season and Vaikkarai was never a port. There is every likelihood of Baris having been river Pampa (Pampayar) which is next to Periar the largest and most navigable river on the West Coast, and Barake must have been Porakad (Prakad) South of Alleppey. The fertile and extensive valley of the Pampa has always been celebrated for pepper, and the depth and width of that river made it navigable for a fairly long distance. Single-stem boats have always been used in its waters and sailing was not dangerous, except for the numerous brood of alligators which flourished there. Porakad is etymologically allied to Barake; it was called Porca or Porcai by the Portuguese and the Dutch. It is an ancient Malabar port and till the rise of Alleppey in the late 18th century, it was

1. This passage is of doubtful import. The serpents referred to may be alligators (*മുണ്ടാക്ക*) which till lately infested the deeper rivers and backwaters of Malabar Coast. The description given—'like snakes in the head and with blood red eyes'—fits in fairly well with alligators. Or, does it refer to the snake boats which look like hooded cobras?

2. Warmington favours the latter view (op. cit. p. 114.)

the principal port of the coastland between Cochin and Quilon. It is mentioned by Varthema (1503) and by Tavernier (1648) and it figures prominently in the Portuguese and Dutch records. They had fortified it and ruins of the fortifications stood there until fifty years ago. Even after the foundation of Alleppey, ships used to call at Porakad, in the monsoon season. The people of Porakad have been sea-faring and even as late as 1770, they owned pattamars and traded with Ceylon and with the other ports of South India.¹

Neleynda is called Neacindi by Pliny, Meleynda by Ptolemy and Ninceylda by the Peutinger Tables. Its identification is difficult, but if Baris is Pampa, as argued above, then Neleynda must be Niranom, about 12 miles east of Porakad. In Keralolpathi one of southernmost of the 64 Nambudri brahmin gramams of Malabar is called Niganda (Nir-mannu), and as it is mentioned along with Chengannur and Tiruvalla and as there was no Brahmin gramam south of Kanneti (Karunagapally), we may identify it with modern Niranom. Neacindi (Niganda) may have subsequently got corrupted into Neranom. The church at Neranom is one of the seven churches said to have been founded by the Apostle Thomas. According to the *Periplus*, Neleynda was 500 stadia away from Muziris and 120 stadia from Barake. These distances are fairly correct if we take Neleynda to be Neranom and Barake to be Porakad.

Barake was the chief port for pepper and the region where pepper grew in large quantities was called Cottonara². That place has been identified by Burnell with Kolathu-had (North Malabar), by Buchanan with Kadathnad (South Malabar). It is true that North Malabar has for long produced good pepper; but as Pliny clearly states that pepper was taken from the interior to Barake by boats on the river Baris, Kottanara must be the name of the region lying on the banks of the Pampa river—i.e., the taluks of Chengannur, Tiruvalla and Ambalapuzha in Travancore. Kuttanad is the name of one of the ancient divisions of Kerala and its location is indicated by the fact that the only place now claiming the name Kuttanad is in Ampalapuzha taluk, on the banks of Pampa. Possibly, the whole valley extending to the east was formerly known as Kuttanad. Indeed, at present the banks of Meenachil river are perhaps more famous for pepper, but its preeminence is rather modern and some of the principal settlers of that region came from the lands adjoining Pampa.

1. At present the Pampa river empties itself into the Vempanad lake and not into the sea, but this must be due to a change in its course. Even now a blind stream of the Pampa comes upto Porakad. (See pp. 14 and 15)

2. *Periplus*, para 56; Pliny, VI, 26.

"Beyond Barake," says the *Periplus*, "is the Dark Red Mountain¹ and another district stretching along the coast towards the south called Paralia." (para 58). This certainly refers to the 'red bluffs', which abut on the coast of Varkalai (8 42' N)", called "Varkalai Beds" by Indian geologists.² The country south of Baris and extending down to Cape Comorin is called Paralia by the *Periplus*, but Ptolemy calls it Aioi (Ayi), where chieftains of the Ayi (Yadava) clan ruled. Paralia is known to Tamil literature and denotes the country around Cape Comorin part of which is now under the sea. The Maharajas of Travancore have even now the title of "Puralisan"—lord of Purala.

The towns mentioned in Paralia by the *Perplus* are Balita and Comar, but that work gives little guidance about the country south of Baris. Ptolemy, who has a fuller account, mentions Elankon, Kottiarra Bammala and Komaria. McCrindle identifies Elankon with Quilon but it is not clear how this conclusion was arrived at. Kottiarra is doubtless Kottara, still an important place in South Travancore. This place is called 'Cottara' by Pliny and in the Pentinger Tables. As for Bammala and Balita, there is some doubt. Balita may be Valiatura, (big port) a coastal town near Anjengo. Schoff identifies it with Varkalai, but it is not convincing. Komaria (Comari) is evidently Cape Comorin (Kanya-Kumari). There stands the ancient temple of Durga, the virgin goddess (Parvati) still a centre of pilgrimage.³

IV

It is clear from the topography sketched above that the coast line of Malabar in ancient times was different from what it is now. The sea in those days must have extended up to the foot of the laterite hills. The whole of Chertalai and a good portion of the taluks of Vaikam, Kottayam and Ambalapuzha and parts of the coastal taluks of the Cochin State must have been then under sea, or at any rate formed an extensive swamp with sand banks and mud banks here and there. The bigger rivers like Periyar and Pampa must have built up large deltas by throwing down silt and sand from the hills and these deltas must have jutted into the sea from the mainland. These deltaic projections were fertile and naturally attracted colonists from far and wide, and to-day they are smiling gardens and fertile paddy fields. The whole of Chertalai must have been a sand bank. It is significant that most of the ports and trade centres mentioned by Roman writers (Muziris, Semne, Barake,

1. This is a translation of the word 'Pyrrhon.'

2. See Imperial Gazetteer, Vol. XXIV, p. 300.

3. Schoff, *op. cit.* p. 234-352.

Neloynda) were at the mouth of one or other of the larger rivers or on their banks not far from the mouth (Alwaye, Tirukareur and Niranom). [See map.]

Owing to volcanic action or some other cause, there have always been taking place changes on the coast line of Malabar. According to immemorial tradition, the whole of Malabar coast, from Goa to Comorin, was formerly under the sea, and it was the miraculous axe of Parasurama that reclaimed it. Whatever be the truth of this tradition, it is certain that Malabar was formerly a narrower strip of land than it is now, and possibly even some of the present day hills were at one time under the sea. When the tunnel at Varkalai was dug, there were found shells which are known to belong to a class of shell-fish that live only in deep water. Yet even in the swamps which were formerly washed by the sea, there are found stumps and ruins of huge trees which formerly grew there¹. The sea seems to have encroached or receded at different times, and recent geological phenomena like the coastal erosions near Cochin, and the Alleppey mud bank, may be taken as typical of what had been going on in the past.

The extraordinary flood of 1341 seems to have been the principal single event responsible for the present configuration of the coast line. The Bar of Cochin was opened in that year and the island of Vaippin (Pudu-Veppu) was formed. At the same time, or subsequently, the sea seems to have receded more and more. Thus, the taluks of Chertalai, Vaikam, Kottayam, Ampalapuzha and Kartikapally came to their present shape and extent. It is not known when, how, and by what stages these tracts of land were formed. The whole question calls for further study by geologists and others more competent than the present writer.

Reviews

A History of Geographical Discovery and Exploration by J. N. L. Baker. (George G. Harrap & Co., Ltd.) 1931. Price 12s. 6d.

This is a systematic work on Geographical Discovery and Exploration covering the whole ground from the days of the Phoenicians and the Greeks and including the latest achievements in the Polar Regions. Whereas it is usual in books of the kind to over-emphasize the discoveries of the earlier centuries from the 15th to the 18th, it is refreshing to note that Mr. Baker has observed a proper perspective and devoted more than half the book for the treatment of the nineteenth century and after. Original sources have been introduced to a large extent, and for the sake of fullness of treatment names of even unimportant explorers have been included to enable the students to follow up their work in greater detail in special works, references to which have been copiously given as foot-notes. The volume, which is well illustrated by a large number of original and useful maps, can be used with great advantage by university students who are preparing for a Degree course in Geography.

Kalingadesa Charitra edited by R. Subba Rao. (Andhra Historical Research Society, Rajahmundry). 1930. Price Rs. 7-8.

This is a symposium of 46 separate articles in Telugu by distinguished experts on the history, archaeology, literature, social and economic life etc., of the Kalinga country, which comprises the eastern part of the Northern Circars and a large part of Orissa. It is a monumental volume of study and research, which fills a gap and deserves a place in every library. The book is copiously illustrated with pictures, coins, maps etc., and contains a valuable appendix containing original inscriptions found in the region, transliterated and translated. It is however to be pointed out that the geographical aspect of the study has not been properly emphasized.

Longmans' Elementary Historical Atlas by S. R. Gardiner (Longmans, Green & Co., Ltd.) Price 1s. 8d.

¹. Report of the Administration of Travancore, 1881-82 (W. Logan), para 231.

This cheap atlas is an abridgement from the author's School Atlas of English History. It contains besides the minimum number of historical maps of the British Isles and Western Europe, some historical maps of America and India in the 18th and 19th centuries.

In place of Scotland in 1285, we would suggest the inclusion of a map of Scotland indicating the relations between England and Scotland under the three Edwards. Similarly, in place of Ireland in 1570 a map of Ireland from the 16th to the 18th centuries will be found more useful. A map of the Peninsular War may also be included. We would recommend this cheap atlas for students of High Schools in India who are studying English History.

Historical Atlas of India by C. Joppen. (Longmans, Green & Co.) Price Re. 1-8.

This is the only good Historical Atlas of India, and as such we would strongly recommend its use by students of Indian History in schools and colleges. Twenty pages of useful explanatory notes on territorial changes, etc. in each of the maps enhances the value of the book considerably. It contains 32 historical maps of India from the earliest times to the present day and a good physical map showing also the distribution of natural vegetation. We would like to suggest the inclusion of a map to illustrate the Afghan Wars.

A Geography of the World (in Tamil) by S. A. Subramanya Ayyar and T. S. Anantanarayana Ayyar (T. G. Gopaul Pillai, Trichinopoly).

Book I—The Southern Continents (Price As. 14).

Book II, Part I—North America (Price As. 3).

This is a text-book of Geography in Tamil written in accordance with the S.S.L.C. (A-Group) Syllabus by two experienced teachers of the subject. The language is simple and facile, and the book is copiously illustrated with pictures, maps and charts. We would, however, like to see the questions at the end of each continent to be of a modern type.

Geography of the Madras Presidency by N. Subrahmanyam. (Longmans, Green & Co.) Price 6 As.

Reform in the teaching of Geography has hitherto been practically confined to the High School; and books meant for children in the lower school have hitherto been of the old world type. It is, therefore, refreshing to find that an expert in the subject has brought out a Geography of the Madras Presidency on modern lines for use in the fifth standard or class. The language is clear and simple, and the method descriptive. The matter is fuller than in similar publications; and the regional method has been followed in a modified form. The book is well illustrated by a large number of maps and pictures, and the get-up is neat.

Elementary Science Series (S. S. L. C.) edited by M. S. Sabhesan (G. Srinivasachary & Sons.)

Plant Life by M. S. Sabhesan. **Animal Life** by R. Venkateshaiyya.

These two little volumes cover the S. S. L. C. (A-Group) Syllabus in Elementary Science under Plant Life and Animal Life, and have been written by masters of the subject in a simple and clear way. Only fundamental facts have been introduced; and all the lumber of unimportant details has been thrown overboard. Practical and observational study has been emphasized throughout, while a large number of useful diagrams and pictures enhance the value of the books. The chapter on *Plants in Relation to Environment* affords a proper basis for the study of regional distribution of plant types in Geography. We congratulate the Publishers on the neat and attractive get-up of the books.

News and Notes

This issue of the Journal is a special double number, containing the papers on Malabar read at the Second Geographical Conference held at Palghat during May last. Owing to the delay in getting several of the papers revised finally by their authors and owing also to the increased size of the volume, its publication had to be delayed considerably.

* * * * *

After the Annual Meeting there were three ordinary meetings of the Association held during the long term. The first of these was on 15-8-31, when Mr. C. Sivaramamurthy, B.A., (Hons.) read

a paper on *the Geography of Kalidasa's Works* under the presidency of Prof. V. Rangacharya, M.A., of the Presidency College. At the second meeting on 12-9-31 when Dr. P. J. Thomas occupied the chair, Mr. A. S. Rajamanikkam, M.A., read a paper *Cotton in South India*. The third meeting was held on 10-10-31 under the chairmanship of Prof. S. Subbarama Ayyar, when Mr. P. S. Loganadhan, M.A., of the University Economics Department read a paper on "*Localization of Industries in India*". All the three papers will be published in the next number of the Journal.

The University of Madras has awarded a Research Fellowship in Geography to Mr. A. S. Rajamanikkam, M.A., who has undergone a Degree Course in the subject at the London University. His subject of research is the *Agricultural Geography of the Tamil Districts*. We congratulate the recipient, and feel glad for the first practical step the University has taken in advancing the cause of the higher studies in Geography.

The Academic Council of the Madras University has, at its last meeting held in October 1931, approved of the proposal of the Board of Studies in Geography to start the Diploma Course in July 1932. It is hoped that the Senate and the Syndicate will take necessary steps to carry out the scheme, so that at the end of the year the first batch of qualified teachers may be available for handling the subject in the college classes.

The Mysore tour, which was proposed to be undertaken during the last Christmas holidays, had to be abandoned owing to lack of response from the members. The value of visits and excursions as a mode of first-hand study, especially for teachers of Geography, cannot be over-emphasized nor measured by the cost of it. It is high time that teachers in this country appreciated it properly and availed themselves of every opportunity to study things on the spot.

We congratulate the Educational Department of the Cochin State for having organised during the last Christmas Holidays a Refresher Course in Geography for the teachers of the subject in the State. Nearly sixty of them were present; and the course

was conducted by Mr. N. Subrahmanyam, M.A., L.T., F.R.G.S., assisted by Mr. G. Narayanaswami Iyer, M.A., L.T. It is hoped that the Director of Public Instruction, Cochin, to whose initiative the course was due, will follow it up by making provision for the proper equipment necessary for the efficient teaching of the subject.

The year is remarkable for the formation of a number of new branches of the Association at Pudukkottah, Vizagapatam, Trichur, Ottapalam, Mangalore and Tirupati. A District Branch has also been formed at Vizagapatam, which has shown remarkable activity within the short period of its existence. Prof. M. Venkatarangaiyya, M.A., who has been elected the President of the Branch, delivered the Inaugural Address on 15-9-31 on the *Distribution of Population* with Mr. C. D. S. Chetti, M.A., in the chair. (This will be published in the next number of the Journal). It was followed up by a paper on the *Economic Geography of the Vizagapatam District* by Mr. T. Appalanarasayya, M. Com., and by two lectures on *Modern Geography* and *Geographical Research* by Mr. N. Subrahmanyam, M.A., L.T. The branch members also went on an excursion to Madhava Dhara and Simhachalam.

The Trichur branch was inaugurated by the Secretary during the last Christmas holidays, when Mr. A. S. Rajamanikkam, M.A., delivered an address on "*My Impressions of England*". It is hoped that the other branches also will show similar activities.

It is proposed to hold the Fourth Summer School of Geography at Saidapet during April 1932 for graduate teachers of the subject in High Schools on lines similar to those of previous years. An announcement regarding the same will be made in the daily press in due course. Applications from teachers wishing to undergo the course may be addressed to the Secretary so as to reach him not later than 1st March, 1932. Further details about the course can be had from him.

For the benefit of secondary grade teachers who handle Geography in the middle school classes, a shorter course will be held at Madura in May 1932 during the week preceding the S.I.T.U. Conference. It is expected that the teachers of the

subject in the southern districts of the Presidency will take advantage of the facilities thus offered. Applications from intending teachers should reach the Secretary by 1st April, 1932.

The Third Geographical Conference will be held at Madura along with the S. I. T. U. Conference about the middle of May 1932, when papers on various aspects of the Geography of Madura and Ramnad districts will be read by specialists, each in his own line. Excursions will also be arranged, and a Geographical Exhibition organised. The programme of the Conference will also include interesting shows of geographical films.

The pamphlet on *Cinema in Education*, enclosed in this number of the Journal, will bring home to the teacher of Geography the enormous value of *visual education*. The Secretary of the Association has arranged with the Educational Moving Pictures Co., Madras, to give shows of geographical films at considerably cheap rates for the benefit of mofussil branches of the Association. Secretaries of the branches wishing to avail themselves of this concession can get further information from him on application.

Books and Journals Received.

Vernacular Atlas Geography Series.

Book I—*Madras Presidency* (Tamil and Telugu editions).

Book II—*India* (Tamil and Telugu editions).

Book III—*Eurasia* (Tamil edition).

Rural Science and Sociology (Tamil).

Geography of the Madras Presidency (Tamil) by N. Subrahmanyam.

Kalinga-tesa Charitra (Telugu).

Elementary Science (Srinivasa Varadachari & Co.).

Elementary Science Series edited by M. S. Sabhesan.

Plant Life by M. S. Sabhesan.

Animal Life by R. V. Seshaiyya.

A Geography of the World (Tamil) by S. A. Subramanya Ayyar and T. S. Anantanarayana Ayyar.

Book I—*The Southern Continents*.

Book II—Part I: *North America*.

A Geography of the World—Australia by V. Satyanarayana.

A History of Geographical Discovery and Exploration by J. N. L. Baker.

A Statistical Study of Paddy Yield in South Canara in relation to Weather by N. K. Adyantayya.

Longmans' Elementary Historical Atlas by S. R. Gardiner.

Historical Atlas of India by C. Joppen.

Report of the Department of Industries, Madras, for the year ending 31st March 1931.

Report of the Operations of the Department of Agriculture, Madras, 1930-31.

Wealth and Welfare—Volume VI, Nos. 26 to 36.

The Indian Educator—July to December 1931.

The South Indian Teacher—August to December 1931.

Hindu Theological School Magazine—July 1931.

Journal of the Travancore Teachers' Association—July and October 1931.

The Geographical Journal—August to December 1931.

The Educational Review—August to December 1931.

Mitteilungen Der Geographischen Gesellschaft, Hamburg. Bd. XLII: *Japans Hafen*.

Quarterly Journal of the Mythic Society—October 1931.

Our Home Magazine—October 1931.

Geography—September 1931.

Journal of the Andhra Historical Research Society—April and July 1931.

Geographical Review—October 1931.

Mitteilungen Der Gesellschaft fur Erdkunde Zu Leipzig 1925-29 and 1929-30.

The New Age—December 1931.

Social Science Abstracts—Volume III, No. 6—June 1931.

Benares Hindu College Magazine—July-September 1931.

BOOKS FOR MADRAS S. S. L. C.—A GROUP SUBJECTS

(Prepared in accordance with the revised syllabuses)

GEOGRAPHY

	Rs.	A.	P.
1. A GEOGRAPHY OF THE WORLD (ENGLISH) by N. Subrahmanyam, M.A., L.T., F.R.G.S., Teachers' College, Saidapet, Part I (The Southern Continents and N. America)—for IV Form	...	1	8 0
Part II—Section I. General Geography of Eurasia	...	0	5 0
<i>Other sections are in the press and will be ready shortly.</i>			
2. A GEOGRAPHY OF THE WORLD (TELUGU) by N. Subrahmanyam—translated by K. Satyanarayana, Geography Assistant, Rajah's College, Parlakimidi, Part I—Sections 1 and 2 (Australia and Africa)	...	0	12 0
3. A GEOGRAPHY OF THE WORLD (MALAYALAM) by N. Subrahmanyam—translated by P. Rama Pisharody, Assistant, Government Victoria College, Palghat. (<i>In the press</i>)	...	will be ready shortly.	
4. INDIAN SCHOOLS IMPROVED ATLAS WITH INDEX	...	1	8 0

HISTORY OF ENGLAND

1. HISTORY OF ENGLAND (ENGLISH) by L. G. Brandon, M.A., (Cantab) with a foreword by B. Clutterbuck, M.A., Wesley College, Madras	...	2	0 0
2. HISTORY OF ENGLAND (TELUGU) by L. G. Brandon—translated by P. Lakshmikantham, M.A., Reader in Telugu, Andhra University	...	2	4 0
3. HISTORY OF ENGLAND (MALAYALAM) by L. G. Brandon—translated by V. K. Achyutha Menon, M.A., D. COM., Retired Senior Inspector of Schools, Cochin State. (<i>In the press</i>)	...	will be ready shortly.	

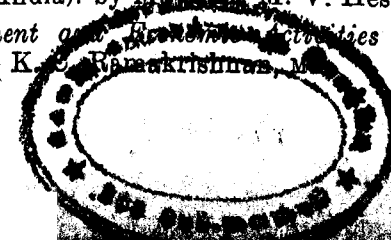
HISTORY OF INDIA

1. A HISTORY OF INDIA (TAMIL) by M. K. Sundaravaradachariar, B.A., L.T., Headmaster, C. C. C's High School, Perambur	...	1	10 0
2. A HISTORY OF INDIA (TELUGU) by Mallampalli Somaskhara Sarma. (<i>In the press</i>)	...	will be ready shortly.	

The Indian Publishing House Ltd.,
5, SUNKURAMA CHETTY STREET,
G. T., MADRAS.

Some Important Papers Published in previous Numbers of the Journal.

1. *Some Aspects of the Geography of Madras*: by Miss E. D. Bridseye, B. Sc.
2. *The Geographical Evolution of Madras and its Environs*: by Rao Bahadur H. Narayana Rao, M.A.
3. *The Flora of Madras and its Environs*: by Mr. M. S. Sabhesan, M.A.
4. *The Planting Industries of Southern India*: by Mr. R. D. Anstead, M.A.
5. *Rural Geography* (with special reference to South India): by Mr. N. Subrahmanyam, M.A., L.T.
6. *The Birds of South India: their Distribution and Habits*: by Mr. C. Lakshminarayana, M.A.
7. *South Indian Cattle: their Breeds and Distribution*: by Mr. A. Swaminatha Ayyar, B.A.
8. *Stages in the Growth of the City of Madras*: by Professor C. S. Srinivasa Chari, M.A.
9. *Sewage and City Geography*: by Mr. N. Swaminathan, B. Sc., A. I. I. Sc.
10. *Rural Life on the West Coast: A Study in Environment*: by Mr. A. Appadorai, M.A., L.T.
11. *The Geographical Data of the Sangam Works*: by Professor V. Rangacharya, M.A., L.T.
12. *Notes on the Maps of Old Madras preserved in the Madras Record Office*: by Professor C. S. Srinivasa Chari, M.A.
13. *The Buckingham Canal: A Survey—Historical, Geographical and Economic*: by Mr. V. K. Sourirajan, M.A., L.T.
14. *The Geographical Basis of Ancient South Indian Culture*: by Professor P. T. Srinivasa Ayyangar, M.A.
15. *Some Results of Recent Upper Air Investigations*: by Dr. K. R. Ramanathan, M.A., D. Sc.
16. *Studies in the History of Some Common Commodities*: by Professor V. Rangacharya, M.A., L.T.
17. *The Comorin Continent*: by Mr. C. P. Gnanamuthu, M.A.
18. *The Geographical Distribution of Disease* (with special reference to South India): by Major A. M. V. Hesterlow, I.M.S.
19. *Environment and Recreation Activities in the Madras Presidency*: by Mr. K. S. Ranganathan, M.A.



20. *South Indian Pearl Fisheries*: by Dr. B. Sundara Raj, M.A., Ph. D.

21. *Migration of Labour* (with special reference to South India): by Mr. P. S. Loganathan, M.A.

A limited number of back numbers are available at half-rates i.e., Re. 1 per number or Rs. 4 per volume.

The Coimbatore Conference Double Number (Volume V, Nos. 2 and 3) contains 14 original papers, read at the First Geographical Conference of the Madras Geographical Association, on various aspects of the Geography of Coimbatore District. A few copies will be given at the reduced rate of Rs. 2 each.

Papers read at the Coimbatore Conference

1. *Geographical Control of Early Kongu History*: by Mr. P. T. Srinivasa Iyengar, M.A.

2. *The Geographical Limits of Kongunadu at various epochs*: by Mr. C. M. Ramachandra Chettiar, B.A., B.L.

3. *A Survey of the Recent History of Coimbatore District*: by Mr. C. S. Srinivasa Chariar, M.A.

4. *Some Place-names of Coimbatore District*: (i) by Mr. S. Natesan, B.A. (Hons.), L.T. (ii) by Mr. C. M. Ramachandra Chettiar, B.A., B.L.

5. *A Note on the Physical Geography and Geology of Coimbatore District*: by Mr. T. N. Muthuswami, M.A., L.T.

6. *Meteorology of Coimbatore District*: by Mr. M. S. Subramaniam, B.A. (Hons.)

7. *Agricultural Geography of Coimbatore District* (with special reference to garden crops): by Mr. K.C. Ramakrishnan, B.A.

8. *Cattle of Kongunad*: by Mr. A. Swaminatha Ayyar, B.A.

9. *Home Industries of Coimbatore District*: by Mr. R. Hari Rao, M.A., L.T.

10. *Mill Industry of Coimbatore District*: by Mr. C. V. Venkataramana Ayyangar, B.A., B.L.

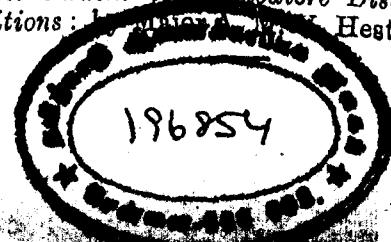
11. *Population of Coimbatore District*: by Mr. S. S. Krishnaswami, B.A., L.T.

12. *A Note on the Urban Geography of Coimbatore and its Environs*: by Mr. R. Dann.

13. *Towns-sites and Communications-lines of Coimbatore District*: by Mr. N. Subrahmanyam, M.A., L.T.

14. *Public Health of Coimbatore District in relation to physical conditions*: by Mr. J. Hesterlow, I.M.S.

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**THE
Madras Geographical Association
RULES**

1. The name of the Association shall be 'The Madras Geographical Association'.

Objects.

2. The objects of the Association shall be:—

- (A) To promote geographical knowledge;
- (B) To secure for geography its proper place in the High School, the University and its constituent and affiliated colleges;
- (C) To help to improve the methods of teaching geography;
- (D) To work for a school of geography being started;
- (E) To promote studies about South India from various standpoints.

3. These objects shall be secured by:—

- (A) Holding meetings and conferences, and publishing periodicals and occasional bulletins;
- (B) Organizing geographical exhibitions and excursions;
- (C) Helping in the preparation of geography books in the languages current in the Presidency;
- (D) Forming a central library of geographical literature, and collecting maps, charts, plans, models, slides and instruments;
- (E) Providing for circulation to members, of books periodicals and other collections;
- (F) And by such other ways as are deemed necessary to effectuate the objects of the Association.

Membership.

4. The membership of the Association shall be open to all those who are interested in the promotion of geographical knowledge or in the teaching of geography.

5. There shall be two classes of member, honorary and ordinary.

6. Honorary members are those who shall be so elected by the council by the majority thereof present at its meeting. They shall be exempt from liability to pay subscription, and shall have all the privileges of ordinary members, except voting.

7. A person shall become an ordinary member upon the proposal by a member, the seconding by another member and approval by the council by the majority thereof present at its meeting. He shall pay an annual subscription of rupees *two* payable in one instalment or in two equal half-yearly instalments at his option.

8. Those who pay an amount of hundred rupees in two years become **LIFE MEMBERS**, and they shall be exempt from payment of any further subscriptions.

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The Journal is a Quarterly published every April, July, October and January. It contains mainly original papers read before the Association; but, it will also include articles, notes, reviews, etc., useful for the teacher of Geography.

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