A REPORT ON THE INVESTIGATION AND POSSIBILITY OF ESTABLISHING A TEA INDUSTRY IN ETHIOPIA

BY

W.H.W. COULTAS

INTRODUCTION

The Tea growing potential of Ethiopia is undoubtedly significant and would appear to offer to Foreign Capital as well as to the indigenous Farmer, opportunities for profitable investment.

In the following pages the writer has attempted to draw attention to those parts of the country where Tea will grow best, as well as to the ways in which His Imperial Majesty's Ethiopian Government should support the Infant Industry if it is to make a significant contribution to the prosperity of the Country.

It is hoped, therefore, that the reader will find the following pages both interesting and helpful.
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7. Over the ten years 1954-63 the production and consumption of Tea has been as follows (Source - International Teas Committee's Annual Bulletin of Statistics June 1964):—

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1954</td>
<td>1362 million lbs.</td>
<td>1287 m. lbs. + 75</td>
</tr>
<tr>
<td>1955</td>
<td>1400</td>
<td>1373 + 27</td>
</tr>
<tr>
<td>1956</td>
<td>1416</td>
<td>1351 + 65</td>
</tr>
<tr>
<td>1957</td>
<td>1467</td>
<td>1501 - 34</td>
</tr>
<tr>
<td>1958</td>
<td>1534</td>
<td>1537 + 3</td>
</tr>
<tr>
<td>1959</td>
<td>1548</td>
<td>1546 + 2</td>
</tr>
<tr>
<td>1960</td>
<td>1545</td>
<td>1563 - 18</td>
</tr>
<tr>
<td>1961</td>
<td>1642</td>
<td>1620 + 22</td>
</tr>
<tr>
<td>1962</td>
<td>1641</td>
<td>1637 + 4</td>
</tr>
<tr>
<td>1963</td>
<td>1630</td>
<td>1643 - 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+127</td>
</tr>
</tbody>
</table>
8. Unlike coffee which is a seasonal crop, Tea is a Daily Crop (further reference is made to this characteristic of the Industry at a later stage) and it follows therefore, that a period of adverse weather, for a short time, as say, three weeks, can make a significant decrease in the harvest. By the same token also, a period of forcing weather may have the effect of creating a temporary surplus over and above the requirements of buyers, which results in a drop in prices.

9. However, taken over a period of years the variation in the yield of green leaf from a Tea Bush remains remarkably constant, and where overall increases have occurred, such as in Ceylon, during the last decade, this has been due to increased applications of fertilizers, improved field techniques, and the gradual replacement of existing unselected seedling Tea, by selected clonal material possessing known characteristics of yield and quality.

10. Tea production, therefore, is not subject to violent fluctuations due to natural causes.

11. However, it will be seen from the above figures that the differences between production and consumption are finely balanced, and the most likely factors to influence the latter are:
   a. Increased consumption in established markets by intensive advertising.
   b. Increased internal consumption in the emerging countries.
   c. Discovery of a successful soluble or "Instant" Tea.
   d. Political
   e. The International Teas Agreement.

12. Increased Consumption of Tea in Established Markets

   By Intensive advertising

   Great Britain is by far and away the largest consumer of Tea. However, it is unfortunate, but nevertheless a fact that the consumption of Tea in this country, over the last few years, has remained relatively static despite an increase in the population.

   Competition from "soluble" Coffee, soft drinks and Milk have had its effect, particularly amongst the younger generation, and there is the possible danger that the "Tea Habit" could die out with the older members of the family.
Fortunately the growers in the principal tea producing countries together with the Tea Trade in Great Britain have become fully alive to this possibility and after protracted negotiations, an intensive advertising campaign, to cost £600,000 per annum for three years has been launched through the media of Press Radio and Television.

The slogan "Join the Tea Set" is intended to make the Image of Tea appeal to the young.

13. Increased internal consumption in the emerging countries

This undoubtedly is the most hopeful field where the grower may look for increased sales.

It has often been said that, next to hot water tea is the cheapest drink in the world, and this has been demonstrated by a consistent rise in the consumption of tea in the emerging countries, corresponding to the rise in the standards of living.

India, the largest producer of tea in the world, is itself a case in point.

Tea being one of India's main earners of foreign exchange, tea drinking within the country has been discouraged, or at any rate, has certainly not been encouraged. Yet despite this, the internal consumption of tea has increased from 197.56 million lbs. in 1952-54 to 292.36 million lbs. in 1960-62.

The potential consumption of tea within this country remains enormous. For instance, an increased consumption of Tea of only 250 grammes per capita per annum would create a famine of tea on the world's markets.

Ceylon, of course, produces far more tea than its habitants could possibly consume, and here the internal consumption has increased from 10.59 million lbs. in 1936-38 to 29.46 million lbs. in 1960-62.

As an example of the increasing popularity of tea the following figures of increases in consumption are of interest:
<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>CONSUMPTION Million lbs.</th>
<th>CONSUMPTION Million lbs.</th>
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<tbody>
<tr>
<td></td>
<td>1952-54</td>
<td>1960-62</td>
</tr>
<tr>
<td>Malaya (Federation)</td>
<td>5.97</td>
<td>7.63</td>
</tr>
<tr>
<td>Syria</td>
<td>1.76</td>
<td>5.31</td>
</tr>
<tr>
<td>Thailand</td>
<td>2.43</td>
<td>3.40</td>
</tr>
<tr>
<td>Turkey</td>
<td>6.59</td>
<td>23.45</td>
</tr>
<tr>
<td>Egypt</td>
<td>38.71</td>
<td>50.26</td>
</tr>
<tr>
<td>Libya</td>
<td>4.92</td>
<td>7.32</td>
</tr>
<tr>
<td>+Europe (E.C.C.)</td>
<td>30.87</td>
<td>43.96</td>
</tr>
<tr>
<td>+U.S.A.</td>
<td>104.78</td>
<td>117.49</td>
</tr>
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</table>

+ (These are traditionally Coffee drinking countries)

14. The discovery of a successful Soluble or "Instant" Tea

The increasing speed of life in the West coupled to the fact that more and more people are living in smaller and smaller apartments, has led to the need for consumer goods which cause little or no inconvenience in the disposal of its waste element.

Here coffee and cocoa have been particularly successful in supplying a soluble and palatable beverage leaving little or no residue.

Unfortunately the same cannot be said for tea, and the present idea of selling tea in small paper or cloth bags, is at the best a make shift expedient.

Tea is up against problems different from that of its rivals but which are too technical for a report of this nature.

There are two fundamentally different methods of making Soluble or INSTANT Tea, vis:-

a. From the finished product or Black Tea.

b. From the Green leaf from the Tea Bush.

a. Numerous firms in the U.S.A. and a few in Great Britain and in Europe sell brands of Instant Tea made from Black Tea.

They have all this in common, vis that it cannot be said to be a palatable drink, and to the man in the street, has a peculiar flavour.
For this reason, therefore, the product has not "caught on" despite large sums of money spent on advertising, and it is used mostly in Vending Machines, canteen and similar institutions.

b. Soluble Tea made from the Green leaves, or flush, produces a drink of the highest quality, but unfortunately after many years of research, it has progressed little beyond the laboratories.

The writer feels confident however that it is only a matter of time before a breakthrough is achieved, and a successful soluble tea processed from Green leaves is on the market.

Having regard to the fact that only approximately 40% of the Black Tea is soluble and the remainder is waste, the implications of success must be obvious to the reader.

Not only would vast sums of money be saved on freight, but the processing plants would have to be erected in the producing countries thus creating a new industry altogether.

15. Political

It would be idle to ignore the serious repercussions to the Tea Industry that would occur should the status quo be disturbed in North East India which supplies the world's largest proportion of tea.

Unlike coffee and cocoa which can be exported in a semi-processed condition, the green leaves have to be processed completely within hours of removal from the Tea Bush.

It will be appreciated therefore how vital and how vulnerable the factory is to the plantation.

Sabotage, labour unrest, or a disruption in the essential supplies such as oils, lubricants and packing materials, could put a factory out of action for weeks. This in turn would upset the growth of the Tea Bushes, the leaves from which have to be harvested weekly.
16. **International Tea Agreement**

The International Tea Committee was set up in 1933 by representatives of the Tea Growers in India, Ceylon and what was then the Netherlands East Indies to administer the regulation scheme under the terms of the International Tea Agreement of February, 1933, with the approval and support of the Government of each of the three participating countries.

The first Agreement provided for the regulation of exports of Tea from, and the control of extensions of the planted areas in, the three countries for a period of five years as from 1 April, 1933. A second Agreement on the same lines was concluded in November, 1936, for a further period of five years from 1 April, 1938, and during the war this was extended until 31st March, 1948.

Kenya, Uganda and Tanganyika were members of the second Agreement until March, 1947, Nyasaland until February, 1939, and Malaya up till the time of the Japanese occupation.

An interim producers' Agreement signed by representatives of the Tea Industry in India, Pakistan, Ceylon and Indonesia continuing the main features of the previous Agreements, was in effect from 1 April, 1948 to 31 March, 1950, and was followed by an Agreement maintaining this scheme in operation in the same four countries for a period of five years ending 31st March, 1955.

The scheme was not thereafter renewed, but an Agreement was reached between the Governments of the four countries and the Tea Industry therein for the continuance in being of the International Tea Committee as a centre for the collection and publication of statistics and other information relating to Tea. Support has subsequently been accorded to the Committee by representatives of Tea producers in Rhodesia and Nyasaland, Kenya, Uganda, Tanganyika and Mozambique.

Some time back feelers were put out by India for a resumption of the Agreement as a means of curtailing supplies - these were firmly rejected by Ceylon and there appears little chance, in the foreseeable future, of it ever being effective again.

17. **Summary**

Having regard to what has been written above, there would therefore appear to be justification for sober optimism for the future of Tea and for the establishment of a Tea Industry in Ethiopia.
CHAPTER 2

THE REQUISITE CONDITIONS FOR THE SUCCESSFUL GROWTH OF TEA

1. Climate
   Rainfall, its distribution, temperature and humidity, and elevation all effect the success of Tea growing and the quality of Tea produced.

2. These factors may be augmented or diminished by the degree of attention which the grower gives to his Tea, and where necessary the application of suitable fertilizers and even irrigation.

3. Quality Tea grows successfully between 3,500-6,000 ft. (1,200-2,000 meters) and will in all probability grow at higher elevations in Ethiopia because of its forcing and warmer climate.

4. It is usual for the finest quality Teas to be grown at the higher elevations, although in some parts of the Tea growing world local climatic conditions at lower elevation during part of the year, can produce Teas commanding the highest prices.
   Examples of this are the hot wind season on the Eastern slopes of the central mountain ranges in Ceylon and during the "second flush" period in Darjeeling.

5. Soils
   Provided the soils are relatively deep and well drained, and their alkalinity does not go much above pH 6.0, rainfall and its distribution is the most important factor in the amount and rate of growth of leaf throughout the year.

6. A rainfall of between 1,250-1,700 mm per annum is fully adequate for Tea provided it is well distributed and there are no prolonged periods of dry weather (two months) without occasional worthwhile showers.

7. Unfortunately rainfall figures of many of the likely Tea areas in Ethiopia have not been maintained for a long enough period to statistically assess the rainfall probability of over 1000 mm. for say 19 years out of 20.
This information has been successfully used in Uganda and Malawi and would have been invaluable for a survey of this nature.

8. Irrigation and "rainmasters" have also been used successfully in parts of Southern Rhodesia, Malawi and South Vietnam. They necessitate of course having an abundant supply of water available during the dry weather, but for the small farmers the cost of "mechanically" producing rain is beyond his means.
CHAPTER 3

TEA AND ITS PROPAGATION

1. Tea (CAMELLA SINENSIS) exists in several varieties, ranging from the small leaf China or SHAN type to the large leaf Assam types. These various types are known as "JATS".

2. Under natural conditions, the Tea plant is a forest tree and grows to heights of 10-12 metres. However, it lends itself to pruning and other horticultural techniques which have for their object the maximum production of Tea shoots.

   Commercial Tea is manufactured from the young fresh tender leaves which grow from these shoots.

3. The plant is usually propagated by seed, and in order to obtain this seed plants are allowed to grow to their natural height under forest conditions and usually in isolated areas to reduce cross pollination.

4. These trees are known as "seed bearers" but before the seed is considered suitable enough for planting, the seed bearers should have matured for at least 7 - 8 years.

5. It is generally accepted that the larger the seed, the better the jat. Good tea seed will weigh between 300-500 seeds per kilo.

6. In recent years, the jats of tea have been vastly improved by selecting individual bushes (known as "other bushes) testing them for yield and quality and propagating them vegetatively.

7. This technique has advanced to such a degree in Ceylon, that no other method of propagation is permitted, by legislation, in newly planted or replanted areas.

8. However in Africa practically all the tea has been grown from seed which has been raised in nursery beds very similar to coffee.

9. At 18-24 months, the seedlings are pulled and reduced by drastic pruning to what are known as "stumps". These stumps which are from 10-12 cms. high are then planted in previously cut holes in the field.
10. A less common method is to place 2 and sometimes 3 germinated seeds direct into the field. The disadvantage of this method, however, is the difficulty of keeping the young seedlings free of weeds or of watering them during the dry weather.

11. However, the writer has seen excellent fields of Tea grown by this method in Georgia U.S.S.R. where as many as 5 germinated seeds have been planted in a hole and all 5 seedlings permitted to grow into one Tea Bush.

12. A fourth method of propagation, which though more expensive is growing in popularity, is to plant germinated seed, or vegetatively rooted cuttings, in polythene tubes filled with suitable soil. These tubes are kept under Nursery conditions until the plants are about 6-9 months and their height is restricted to between 18-20 cms by what is known as "thumb-nail" pruning. The effect of this is to produce a miniature Tea Bush, whilst still in the Nursery.

13. The tubes are then transported to the field and carefully planted in to previously prepared holes.

The polythene tube is either slit up both sides or removed altogether at the last moment.

14. The advantages of this method is that the plant continues to grow with the minimum amount of root disturbance at the time of transplanting.

15. It is now the usual practice to plant tea in contour rows in order to preserve the top soil and prevent erosion.

16. Under favourable conditions the Tea Bush, if grown from seed, will produce small quantities of commercial leaf in about three years after transplanting.

17. Well grown V. P. plants may reduce this period by 6 - 9 months.

18. However, from what the writer has seen of the small tea blocks in the Bonga and Gogeb Valley areas the bushes should be ready for light plucking within 2 years of transplanting, so forceful is the climate.
19. Profitable yields are obtained between the 6th and 7th year.

20. Thereafter once established, either in the form of a large plantation or small tea farm and provided it receives good husbandry, Tea can become a long-lived tangible asset which is likely to remain productive for a period of from 50 - 60 years.

21. In Ceylon where the soil is much less fertile than in the prospective Tea areas of Ethiopia there are many instances of still increasing yields from Tea Bushes which are over 80 years old.
CHAPTER 4

TEA AND ITS PROCESSING

1. Tea (i.e. Black Tea) is processed in "Factories" which are an integral part of the whole system of Tea production.

2. Unlike the coffee bean, which after drying, may be stored for a considerable period of time before it is finally processed for consumption, fresh Tea leaves must be processed completely within 24 hours of being removed from the Bush.

3. Once the Black Tea leaves the factory it undergoes no further processing, other than blending with Teas from other countries, until it reaches the housewife.

4. For that reason therefore it is considered and strongly recommended that "Tea Factories" should be classified as "Agricultural Enterprises" and Not as "Commercial Enterprises" thus qualifying for the concessions under the Ethiopian Tax Laws.

5. The 'ORTHODOX' or 'CLASSIQUE' method of Tea manufacture comprise, a) withering, b) rolling, c) fermenting, d) drying, e) sorting, f) cleaning, and g) packing.

   a. WITHERING The object of withering which is carried out on wire or hessian racks, known as "Tats" in spacious lofts usually with controlled ventilation, is to reduce the moisture content of the leaves until they are pliable and ready for rolling.

   It is also considered that certain chemical changes take place during the process of withering which effect the quality of the finished product, though the exact reactions are not yet fully understood.

   According to climatic conditions, withering may take from 12-20 hous.

   b. ROLLING This process ruptures the cells of the leaves and releases the juices which immediately begin to oxidize or ferment. At the same time the action of rolling imparts a curl or twist to the particles of the finished product which is considered desirable by the Trade.
Rolling may be repeated from 3 to 6 times according to the quality of the green leaf, the type of Black Tea it is desired to make, and the altitude of the Factory.

The main precaution at this stage is to prevent temperatures of the leaf rising above 33°C.

c. **FERMENTING** The chemical re-actions which occur during the process of fermenting are still the subject of scientific research.

However, from a practical point of view it is known that as fermentation proceeds the colour of the rolled leaf changes from green to copper whilst the aroma or 'nose' increases considerably.

It is at this point that the processing of Tea changes from a 'science' and becomes an 'art'.

Practical experience is now more valuable than scientific knowledge, and a good "Teamaker" with years of practical experience, who can judge exactly when the most favourable conditions of the fermenting leaf have been reached is worth considerably more than a young science graduate who is without practical experience.

When it is judged that fermentation has been carried on long enough the process is halted by "Drying".

Rolling and Fermenting times combined may vary from 2½ to 4 hours.

d. **DRYING OR FIREING** This consists of placing the fermented leaf into the top of the DRYING MACHINE OR DRIER, where, by a system of endless chains it falls to the bottom.

In its passage from top to bottom, the leaf encounters a strong upward current of air heated to between 83° to 98° C.

The action of the hot air is to seal the outside of the leaf particles and so prevent further fermentation.

It also imparts to the leaf its familiar black colour, and the process of drying takes from 18 - 22 mins.

At this stage the chemical and mechanical processing of Tea has been completed. All that remains to be done is to sort and clean the Tea into its various grades (usually 5 - 7 for orthodox manufacture) and pack it into aluminium foil and paper lined 3 ply chests ready for shipment overseas.
6. **NEW TECHNIQUES AND ECONOMIES** are now being introduced into Tea manufacture and are largely confined to the processes of:

- **a. Withering**
- **b. rolling**
- **c. fermenting**

**a. Withering** Very successful withers may now be obtained by placing the fresh leaves on a perforated tray of a holding BIN. Ambient or warmed air is then forced through the leaf.

The advantage of this method is that it does away with the large lofts mentioned earlier. Practically all modern factories employ system which is known as "TROUGH WITHERING".

**b. Rolling** The "ORTHODOX" roller which consists of an open ended box filled with withered leaf rotating over a horizontal table on which shallow battens are fixed to impart a curl or twist to the leaf, is now being superceded by:

- **a. The C.T.C. machine** (cut, tear and crush).
- **b. The Rotovane** which works in much the same way as a kitchen meat mincer.
- **c. The Legge cutter** which cuts rather than crushes the leaf.

The advantages of these new machines are that they occupy less space, have a throughput considerably in excess of the orthodox roller, require less power to operate and therefore show considerable capital savings.

Their disadvantages are:

- **a. These machines have proved unsuitable for the smaller leaf jat of Tea found in Ceylon and Darjeeling.**
- **b. They require a high quality of green leaves i.e. "2 leaves and a bud" which is the standard of "good plucking". However in Africa, where most of the Tea is of the large leaf variety, a combination of the C.T.C. and Rotovane machines appears to have won considerable favour in recent years.**
c. **FERMENTING** This is carried out in shallow trough or SKIPS and largely eliminates the handling of fermented leaf.

7. After having carefully studied most of the prospective and potential Tea areas in Ethiopia, and having regard to the extremely forcing climate of these regions, and taking into account the likely type of jat of Tea to be planted, the writer would recommend the following system of manufacture for Tea Factories in Ethiopia viz:-
   a. Trough withering
   b. C.T.C. and/or Rotovane Rolling
   c. ORTHODOX Fermenting
   d. ORTHODOX Drying
   e. Sorting for the type of Tea produced by "b"

8. **COST** It will be appreciated that the construction of modern Tea Factory involves a considerable amount of capital expenditure, the return of which cannot be expected for a number of years.

9. But without the means of processing, there would be no point in growing Tea, and the cost of supplying this need is far and away beyond the means of the Small Tea Farm or Outgrower.

10. This problem has been solved in other countries by:-
   a. Private Plantations owning factories agreeing, under set conditions, to buy the green leaf grown by Small Tea Farmers.
   b. By a corporation financed by either public or private funds, or both, constructing factories for the sole purpose of buying small farmers' leaf.
c. By Small Farmers and Outgrowers forming themselves into co-operative societies and building their own factories.

d. By a corporation, such as in b, opening up a large plantation (say 10-15 gashas), complete with a centrally situated factory.

When the Plantation has been fully developed, the corporation then sells to selected farmers and outgrowers plots of mature Tea ranging from 1 to 2 hectares around the perimeter of the plantation leaving between 150-200 hectares of Tea immediately surrounding the Factory to be worked by the corporation.

11. This latter method is the one which the writer would recommend to the Ethiopian Government for their most serious consideration as the most likely way of launching a Tea Industry in this country.

12. The subject is discussed in greater detail in chapter 11.
1. Until Tea is growing on a commercial scale it is not possible to say from what pests it will suffer.

It is fortunate, that, to date, the fungus Exobasidium Vexans (Blister Blight) which costs many millions of dollars per annum to control in India and Ceylon, has not been reported in Africa.

Should this occur, it is likely the Ethiopian Tea would suffer considerably owing to the forcing and humid climate in the areas suitable for Tea.

For this reason therefore, on no account should seed be obtained from outside the continent of Africa.

It has been reported that a consignment of seed was recently exported to New Guinea from Ceylon. On arrival the seed was found to contain the fungus and, quite rightly, the whole lot was destroyed.

2. **ARMILLARIA MELLEA** (Root Disease)

This disease is very common in Africa where tea has been planted in Forest areas.

In Kenya large areas of Tea have been killed by Armillaria in its 3rd and 4th year because the Forest Roots had been improperly cleared.

Theoretically, all trees should first be killed by ring-barking or by poisoning, a process which may take as long as two years.

In practice however, it has been found that it is quite impossible to kill, by either means, many of the largest trees because of their size and corrugated trunk formation.

Furthermore, besides the time factor, the act of killing deprives the tree of much of its value as timber or fuel, for which there is a considerable demand, at prices which would offset, if not completely, a large proportion of the high cost of clearing.
However if trees can be pushed over by bull-dozer without felling, much of the root system is brought to the surface and easily disposed of. It is then necessary to follow this up, by raking the ground to a depth of 60 - 65 cm.

3. **INGICHA GRASS** (*Cyperus Rotundus - Cyperaceae*).

"The most troublesome weed in Bengal"
(Watt)

"A low sedge with numerous underground edible tubers found at all elevations in most moist regions, often as an obnoxious weed. The only way to eradicate it is to dig up the tubers"
(Macmillan)

This pest is already well known to coffee growers in Ethiopia and it is likely to create similar problems in Tea. Undoubtedly control whilst the Tea is developing, is going to be a costly business.

However, whilst inspecting a small block of Tea in the Abekoran area north west of Gore, where the plants had been spaced at approximately 75 cm. x 75 cm. and had been allowed to grow to their natural height of 15 - 16 metres, the writer was surprised to see that the ground beneath was completely free of Ingicha grass, and in fact, all weeds. By contrast, Ingicha Grass was seen to be flourishing on the perimeter of the Tea Block, where sunlight had penetrated.

It would therefore, appear to be possible to control if not to eradicate the pest by ensuring that the Tea Bushes form a thick carpet-like cover over the ground. This in turn has a bearing on what should be the most favourable density of planting and is discussed in Chapter 7.
CHAPTER 6

A SHORT HISTORY OF TEA IN ETHIOPIA

1. It is surprising that up to now, no entrepreneur has exploited Tea in Ethiopia, though it must have been obvious to many from observing the results of the small test plots of Tea planted by others in the Kaffa and Illubabor Provinces, that the plant in certain parts of these provinces will "grow like a weed".

2. The probable reasons for the lack of enterprise in the past are:-
   a. Lack of communication
   b. The world wide Trade Depression during the early thirties.
   c. The outbreak of hostilities in 1936.

3. The writer has endeavoured to discover the circumstances under which these small blocks of Tea came to be planted.

4. **BONGA AREA - KAFFA PROVINCE**

   Probably the first person to have introduced Tea into Ethiopia was a Father George Holland a Catholic Canadian Missionary, who procured a small quantity of seed from Kenya in 1927.

   The germinated seeds were planted near the Italian Catholic Mission Station in Bonga, as well as in Dembidolo in the Province of Wollega.

5. After the lapse of a year Father Holland returned to see how the Tea had survived. He found the plants at Bonga were flourishing, whilst those at Dembidolo had died probably due to lack of rain.

   The plants at Bonga may now be described as trees being between 10-15 meters high.
6. **GORE AREA - ILLUBABOR PROVINCE**

On his way back to the Sudan, Father Holland stopped at Gore and there met Kenyazmatch Majid Abboud, now over 80 years old, who owned a coffee plantation at Gumera some 8 kms. from Gore on the Gore-Gumera sub-district road.

7. As a result of these discussions, then the Governor General Ras Nadew, with the assistance of Captain Erskine, British Consul General at Gore, arranged for a consignment of 11 boxes of Tea seed (approximately 1,500 seeds) to be sent to Ethiopia from Southern India.

8. Unfortunately the consignment took over 12 months to reach its destination, including a 20 day journey from Addis Ababa to Gore.

9. It was not surprising therefore that out of the whole consignment less than 5,000 seeds germinated.

10. This took place in the Coronation Year of 1930.

11. The seeds were distributed to different parts of the province and Kenyazmatch Majid Abboud received 300 plants comprising 3 jats namely, Assam, Hybrid and China. (vide illustration).

12. When inspected by the writer, all these plants were growing vigorously, including an area of 10 hectares of Tea, which had been planted with seed from the original plants.

13. A further batch of seedlings had also been planted by Captain Erskine in the Abekoran area, reached during a 6 hour mule ride along precipitous tracks north west of Gore.
SAMPLES OF TEA FROM ORIGINAL SEED ON

KENYAZMATCH MAJID ABOUD'S PLANTATION - GORE-ILLUBABOR

A
A. Mixed Hybrid

B
B. Assam

C
C. Mixed China

Photo by Ato Bekele Worku
14. The plants had obviously grown excellently, though through neglect and depredation few of the original plants are left.

15. However, one kilometer further west, some 7,000 plants had been planted in 1940 from seed from these original plants. These were flourishing despite neglect.

16. **JIMMA AREA**
   **MALCO FARM** (on the outskirts of Jimma). Here approximately 2 hectares of Tea were planted during the occupation.

17. For a period of time, the land was leased to Indians, but has now come under the control of the Authority of the local Agricultural Department.

18. The Tea is well grown but suffers from the effect of being too widely planted, with the result that weeds are having a toxic effect upon it.
   Last year approximately half the bushes were cut across at about 65 cms. and recovery has been excellent.

19. **EXPERIMENTAL TEA PLOT - JIMMA**
   Some 300 tea plants have been planted out as "stumps" in an area below the office of the Department of Agriculture.
   The plants had been grown in an adjacent nursery for a period of 18 months from seed received from Kenya.

20. In the 3 months since leaving the nursery, the plants had grown some 45 - 60 cms. which is remarkable by any standards.

21. The jat is a mixture of Assam and Betjan with a few very poor specimens.

22. Many of the plants were inclined to be yellowish probably due to the toxic effects of the grasses and weeds that were in the process of throttling them.
23. ATO TADESSA'S FARM — GOGEB VALLEY

Reference is made to the trial block of tea on this farm in Chapter 8.

24. In all the writer visited 11 areas where Tea was growing, and not only growing but flourishing in the Bonga, Wush Wush, Jimma Gogeb Valley Gore and Abekoran areas.
CHAPTER 7

PLANNED DEVELOPMENT OF THE TEA INDUSTRY

1. Ethiopia is fortunate in this respect in that, not having had a Tea Industry she is able to control and guide its development from the very commencement.

2. In most other Tea growing countries of the world, the Industry had been in existence for many years before coming under the control of a central authority.

3. Because of this, many glaring and lasting errors were perpetrated, largely through ignorance, which would not have occurred had the Industry been guided along what are now considered to be enlightened lines.

4. For example, take the question of a suitable planting material. There are still many tens of thousands of hectares of Tea in India and Ceylon comprising low jat bushes producing Teas of poor yields and inferior quality.

5. Today in these countries, only planting material of proven excellence is permitted in New Tea Plantings, but it will still be many decades before the existing low grade bushes are replaced by superior types.

6. A second example is the planting of the Tea in lines. For the sake of economy and easy opening of land, most of the Tea in the steep fields of Ceylon were planted in lines up and down the hills, which, over the years has caused serious soil erosion. Today, thanks to central control, all new Tea plantings have to be planted on the contour, thus saving what little is left of the top soil in that country.

7. A third example is the density of planting. In Ceylon where Tea was introduced following the crash of the Coffee Industry, the bushes were planted, through ignorance, at much too great a distance apart, whilst in parts of South Vietnam, due to the same reason (ignorance) Tea is so widely planted, as to be only covering half the land on which it grows.
8. Today in Ceylon, a minimum density of plants per hectare is laid down so as to provide maximum yields and to permit the bushes to cover the ground, as a carpet, in the shortest possible time, thus preventing soil erosion, controlling weed growth and retaining the moisture in the soil.

9. For these and other reasons, which are discussed in this Report the writer strongly recommends, as a first step, the creation of a Central Authority to co-ordinate all phases of the Industry, not in the deadening spirit of Bureaucracy, but as a help and guide to enable this Infant Enterprise to develop along lines which will bring the greatest prosperity to the Country.

10. The writer recommends that legislation should be enacted to establish an Authority and to set out its functions.

11. As a suggestion, it might be called "The Ethiopian Tea Authority", or E.T.A. for short.

12. The Authority should be an autonomous Body and subject to Governmental control only insofar as Policy.

13. It should be empowered to enter into contracts, to sue and to be sued, and subject to the Government's approval, frame rules governing all phases of the Industry.

14. The membership of the Authority should consist of Representatives of the various interests having responsibility for the development of the Tea Industry and should include:
   a. The Minister of Agriculture or his Designate (CHAIRMAN)
   b. The Minister of Finance or his Representative.
   c. The Minister of National Community Development or his Representative.
d. The Minister of Commerce & Industry, or his Representative.
e. The Minister of Interior or his Representative
f. A Senior Member of the Land Reform and Development Authority.
g. The General Manager of the Ethiopian Tea Authority (The
   Assistant General Manager of the Ethiopian Tea Authority,
   who shall act as Secretary).

15. To begin with the Authority will require the following Executive
   Staff viz:--

   a. A General Manager
   b. An Assistant General Manager
   together with a supporting secretarial and clerical staff.

16. The two executive officers mentioned above should be men of out-
   standing ability with long experience of the Tea Industry. Their emoluments
   might be covered by one of the Aid Schemes

17. It is recommended that the cost of the Authority should be under-
   taken by the Central Government until such time as a cess on processed Tea
   leaving the Factories is sufficient to cover the cost.

18. The functions of the Authority through its Executive Officers should
   be:--

   a. Assist foreign capitalists in the opening of new Plantations
      and/ or in the construction of Factories to process outgrowers
      green leaf.
   b. To prepare plans for the Development of outgrowers of Small
      Farmers Tea for the approval of the Government
   c. To issue licences for the importation of approved planting
      material whether to be used by outgrowers or Plantations
d. To secure good supplies of seed and to establish and operate Nurseries, when the demand arises, either independently or in conjunction with the Ministry of Agriculture.

e. To issue licences for the tax free importation of liquid fuel and lubricants for motive power only.

f. To train Tea growers in the latest techniques of Tea cultivation.

g. To negotiate, on behalf of Outgrowers agreements for the sale of green leaf to Factory owners.

h. To prepare a complete list of Import requirements for the Tea Industry (i.e., for Agricultural purposes) for the benefit of the Customs and Excise Departments. Licences could be issued by the E.T.A. to Importers certifying the imports which are essential for the Tea Industry. It is considered that this would expedite the Entry into the country of such goods, and make for greater efficiency.
CHAPTER 8

THE PROPOSED TEA PLANTATIONS TO BE OPENED UP BY

MESSRS. BROOKE BOND LTD. AND BY

MESSRS. BONGA TEA COMPANY OF ETHIOPIA

1. MESSRS. BROOKE BOND LTD.

This company has carried out a detailed inspection of the following three areas to find a suitable location for a Tea Plantation.

a. The GOGEB Valley south of Ato Tedessa's Farm.

b. The BITTA Forest area, north of the road leading from Wush Wush to DETIBIRA with its western boundary the WUSHI River some 40 kms from BONGA and 19 kms from WUSH WUSH Plantation.

c. The area south of the road mentioned in (b) for a distance of about 5 kms and in extent about 65 gashas and 19 - 21 kms from Bonga.

2. THE BONGA TEA COMPANY OF ETHIOPIA

The land which this company is interested in for the same purpose comprise:

a. Land to the north of Wush Wush Plantation owned privately of about 18 gashas.

b. Land to the west of (a) belonging to the State Bank of about 1 gasha.

c. Land belonging to State Domain in the same area of about 5 gashas.

d. Part of the land, belonging to several persons, to the EAST of WADDELLA River on both North and South of the road as far east as Wush Wush Village.

e. Uncultivated land belonging to the Wush Wush Plantation Company.
3. All the above areas have been carefully studied by the writer, on the ground and from the air, who has the following comments to make:

4. LAND INVESTIGATED BY MESSRS. BROOKE BOND LTD.

a. The Gogeb Valley South of Ato Tadessa's Farm

It is understood that the Company has decided against this area for climatic reasons, the rainfall being considered to be inadequate and because of the hot winds experienced in December and January.

On the other hand, the trial block of Tea comprising some 100 bushes on ATO TADESSA'S Farm, which was some eighteen months old when inspected by the writer, had shown really remarkable growth that it would be a simple matter to begin taking commercial quantities of leaf within 24 months.

In fact the growth at eighteen months was equivalent to 3 - 4 years growth at a similar elevation in Ceylon. What is further remarkable about the growth of these bushes, is that 1965 has apparently been a very dry year with rainfall well below average.

In Ceylon much of the tea on the Eastern Slopes of the Hills experience very dry winds during June and July. Although yields naturally fall, it is a period of very high prices, when the Tea produced is of the highest quality and flavour - (In the Trade it is known as the "UVA Flavour").

One would hesitate to say that similar conditions are likely to occur in the Gogeb Valley, but on the other hand there is no reason why they should not.

Two further favourable features of the area are that the ground, which is gently undulating, is covered in light scrub and grass, and therefore would be much cheaper to clear than Forest, and finally, it is traversed by an all weather highway.

One present disadvantage is that the area is infested by the insect SINULIUM which transmits ONCHICHERCIASIS and FILARIA - however, it is confidently expected that the pest would disappear once the land was cleared.
b. The Bitta Forest

It is understood that the Company has also decided against this area on account of its inaccessibility, being some 40 kms. from Bonga along a track which can only be negotiated in the driest of day weather.

The cost of building and maintaining an all weather road together with the cost of clearing the Forest would make the project uneconomical from the start.

In other respects however the area is probably the best for Tea in the Bonga District.

If the Highway Authorities could be persuaded to extend the Bonga Highway as far as the Wush Wush River large tracts of land, ideal for Tea, would immediately become economical and profitable enterprises.

c. The area of some 65 Gashas, South of Wush Wush Plantation and 19 - 20 kms. from Bonga.

The company has decided to exploit this area, provided the already long drawn out negotiations between the Ethiopian Government and themselves of being put into possession of the land, are not further protracted.

For the most part, the land comprises thick secondary Forest, and is more broken in contour than the areas described under (a) and (b).

However the area will undoubtedly produce excellent yield's of Tea and the question of communication with Bonga will be considerably less expensive than from the Bitta Forest.

5. Land investigated by the Bonga Tea Company of Ethiopia

The areas in which this Company is interested and which are described in (a) to (e) on page 29 are all on the perimeter of Wush Wush Plantation. The land is under thick secondary forest which in places is under-planted in Coffee. There is no question but that the land, once cleared and opened will produce heavy yields of Tea. Both climatic and soil conditions are favourable.
CHAPTER 9

AVAILABILITY OF LABOUR IN THE PROPOSED TEA AREAS
OF BONGA KAFFA PROVINCE AND CORE ILLUBABOR

1. A Tea Plantation, complete with Factory, and undertaking a full agricultural programme, requires a permanent labour force of between 2.5 and 3 labourers per hectare or say between 100 - 120 per gasha.

2. Assuming Messrs. Brooke Bond Co. Ltd. and the Bonga Tea Company of Ethiopia operate eventually between 80 - 90 gashas of Tea between them, a permanent labour force of some 8000 - 9000 labourers would be required in the Wush Wush area.

3. From what the writer could gather from numerous enquiries, it would be quite impossible to supply this demand from local village resources and furthermore it is understood that the local villager prefers the easy life of the village to the regular employment on a plantation.

4. It follows therefore that Labour from other provinces will need to be indentured, and already the Coffee plantations in this area employ Kambatta labour who are said to be hard and reliable workers.

5. The numbers who now come from other areas seeking employment during the Coffee Picking season, are of course only fractional to the numbers that would be required, permanently, should these two large Plantations become established in the Bonga Area.

6. To say the least it is unfortunate that both these Companies should have chosen the same locality for their operations when it would have been in their own interests as well as that of the Country to have selected areas much further apart.
7. This sudden demand for labour is bound to create problems and the workers would not be human if they did not attempt to exploit the situation by playing one Employer off against the other.

8. It would also be unlikely that the present daily wage of £2.10 for unskilled labour would remain at this figure for long, to the detriment of local coffee growers who are finding it difficult enough to make ends meet.

9. At an early stage in the Development of the Industry, Government, together with Representatives of Employers and Workers should agree on the scale of wages to be paid, the type of dwelling to be provided and other amenities and fringe benefits which are now considered essential in Large Plantations.

10. It should be one of the functions of the Ethiopian Tea Authority to see, on the one hand, that the Labourer is not exploited, and on the other, that the Employer is also not subjected to blackmail.

11. In Gore the position is different in so far that there are no large Coffee Plantations nor other large Employers of labour.

12. Furthermore the writer was given to understand that there was a certain amount of under-employment if not actual unemployment in this area.

13. The Governor of the Province was confident that sufficient labour to open a Plantation in Gore was available, and furthermore, once the news spread, labour from other areas would be attracted.
CHAPTER 10

AREAS OTHER THAN THE KAFFA & ILLUBABOR PROVINCES WHICH MAY BE SUITABLE FOR TEA

1. **SIDAMO PROVINCE**

   The topography of the area south of YIRGALEM and east of Lake Abaya appears to be suitable for Tea. The ground is undulating and, where not already cultivated, is covered in grass land and light scrub which would make clearing the land a relatively simple and inexpensive business.

2. Communications are also reasonably favourable, with an all weather road (which is being extended) from Dilla to the railhead at Mojo, a distance of 296 kms.

3. It is also expected that the area will be further opened up by the construction of a rail link from Nazareth to the Dilla area.

4. Coffee is the principal export crop of the district, but whereas Coffee will usually flourish in areas suitable for Tea, the reverse is not the case.

5. **Soil**

   For the most part, this consists of dark brown loam of considerable depth. Unfortunately the pH factor is marginal and according to Murphy's "Soils of Ethiopia" averages around 6pH. This is considered to be somewhat above the requirements for the successful cultivation of tea.

6. However Murphy indicates that there are areas where the soil is more acid and well within the requirements for Tea Growing and records. Wondo 5.4 pH, Dilla 5.8 pH, Shadadimo 5.6 pH.
7. Precipitation

Unfortunately, there are no records of rainfall. As mentioned elsewhere, tea, besides requiring an acid soil, also requires an adequate and well-distributed rainfall, spread over 9 - 10 months of the year.

8. For confirmation therefore, the writer spoke to and questioned farmers who had had many years of local experience.

9. They were unanimous in stating that at no time during the year despite the severest drought, did the vegetation or grass turn brown, but remained constantly green.

10. For these reasons therefore the writer considers it to be worthwhile, and therefore recommends, that a number of small trial plots of tea, comprising say 200 plants, be set up in the following areas:

- WANAGO
- CHEREHA
- DILLA
- AGRESALEM
- WONDO ALATAN
- WONDO MELGE
- YIRGALEM

In all it is suggested that there should be at least 10 such trial plots.

11. The work should be under the direct control of the Provincial Agricultural officer who should be responsible for selecting the sites, germinating the seed, and planting out the trial plots.

12. He should also maintain detailed records of costs, rate of growth, rainfall and any other item of interest.

13. After the formation of the Ethiopian Tea Authority he should liaise with the Advisory Officers of the Department.
14. It is considered that a period of 3 - 4 years would be sufficient time in which to judge whether or not Tea cultivation in this area will be successful.

15. There appeared to be enough uncultivated land in this area to support a number of large Plantations. The writer was unable to discover, however, whether the land was privately owned or belonged to the State Domain.

16. **WOLLEGA PROVINCE**

   The area west of the Ghibai River, as far as Lekempti, and including the Amuma Forest would also appear to be worthwhile establishing trial plots of Tea.

17. The land which is relatively flat near the Amuma Forest becomes hilly as one approaches Lekempti and beyond.

18. The vegetation comprises tall grass under bush and tall trees, and everywhere the growth is luxuriant.

19. According to Murphy's "Soils of Ethiopia" "95% of the area have soils which are acid, 77% being moderate to strongly acid".

20. Rainfall figures are available for Lekempti and Bacco and these are shown in Appendix V.

21. The area which attracted the writer's attention most, however, was the Amuma Forest, where there are said to be 15 gashas of State Domain land, at an elevation of 2000 meters approximately.

22. Although there are no records of rainfall for this particular area, the fact that the trees are festooned with a luxuriant growth of fern, lichen and moss, to the height of 10 meters, is an indication of the humid conditions obtaining therein.
23. Information gathered from local farmers also indicate that the period of dry weather seldom exceeded 2 - 3 months.

24. Next to Gore, where Tea can be actually seen to be growing, the writer would consider the Amuma Forest to be the next most suitable area for the exploitation of Tea.

25. Labour is said to be plentiful.

26. An advantage which the Amuma Forest also has over the Bonga and Wush Wush areas is that the land is only mildly undulating, covered by a secondary Forest with an easy level access to the Highway (15 - 20 kms.) connecting Addis to Lekempti.

27. A disturbing feature however about the Amuma Forest area to which the writer would draw the attention of the Authorities is the extensive depredations at present occurring in the Forest, where villagers are clearing and setting fire to the undergrowth before planting corn.

28. Areas which have already received this attention and have now been abandoned, have reverted to scrub.

29. If this menace is not halted forthwith, it will only be a matter of time, before the Amuma Forest will lose most of its value as a potential Tea Development Area.

30. The writer strongly recommends that small trial blocks of Tea, similar to those mentioned in paragraph 10, be planted out in the Bacco-Lekempti area in the following places:-
   a. In the compound of the Swedish Medical Mission - Lekempti. (the Director has agreed to co-operate).
   b. Lekempti - Hotel (the Proprietor has agreed to co-operate)
   c. The Ethio-German Bacco Agricultural Research Station.
   d. Two or three Farms in the Amuma Forest area.
31. On the Authority of the Director, Agricultural Research Department, the writer, when he paid a short visit to Kenya, placed a firm order for 10 kilos of Tea Seed, 1966 crop, with Messrs. The KAPWARREN TEA COMPANY LIMITED - P. O. KAIMOSI, KENYA.

32. Before doing so, however, the writer made a detailed study of the seed bearers, and inspected the progeny on neighbouring plantations. He is satisfied that the seed is of very good quality producing an even type of Tea of the MANIPURI TYPE.

33. The seed which costs 6/50 shillings per lb. (roughly E$4.75 per kilo) ex Plantation, is due to arrive during April - May 1966.

34. Ten kilos of seed, if carefully and correctly germinated according to the Instructions in Appendix I should be sufficient for the trial plots recommended in paragraphs 10 and 30.
CHAPTER 11

TEA GROWN BY OUTGROWERS OR SMALL TEA FARMERS

1. In practically all Tea Growing Countries of the world there has arisen, following the establishment of large Plantations, a lesser industry belonging to the Out grower or Small Tea Farmer, of growing Tea, the leaves or "Flush" from which, are sold to and processed into Black Tea by, the Factories owned by the large Plantations.

2. In some countries such as Kenya and Uganda, "flush" produced by the small operators now far and away exceeds the capacity of the Plantation owned Factories to process.

3. The result has been that separate and modern Factories have and are being erected for the sole purpose of processing this Tea.

4. Some of these factories have been erected by private enterprise, some by semi-government concerns, such as the Kenya Tea Development Authority, and a few by co-operative Societies run by the outgrowers themselves.

5. It is the case of the Small Man, seeing that the Big Man is on to something good, decides to copy him.

6. Unlike Coffee or Cocoa, which may be sold by the Out grower to the middleman, or co-operative society in a semi processed state requiring little or no expensive capital equipment, Tea leaves have to be processed completely within 20 - 24 hours if they are not to be ruined, and the processing machinery is both expensive to buy and requires considerable skill to handle.

7. For this reason therefore, the large Plantation must be established first, and moreover, must be seen to be prospering, before the conservative Small Farmer will decide to change from his conventional crops to growing Tea.
There is now the prospect of two large companies, in the private sector, opening up Plantations in the Bonga/Wush Wush area.

It is to be hoped that once they have become established, their respective Boards of Directors will agree to buy Tea leaf up to an agreed quantity and standard, that will inevitably be grown by Outgrowers in the vicinity of these Plantations.

In this way a small beginning will be made in encouraging the growing of Tea, other than on Plantations in this area.

However, development on these lines is bound to be slow and it would be many years before there was any real change-over from conventional crops.

The writer has therefore, after a great deal of thought and consideration, decided to recommend the setting up of a corporation for the purpose of opening up a substantial area of Tea in Gore and erecting a Factory thereon.

Once the Plantation is established, and has become a profitable unit, the policy of the corporation would be to divide the mature Tea around the perimeter of the Plantation into small blocks ranging from one to two hectares, and sell them, at a price to be agreed later to selected Small Farmers, preferably those who had sought employment on the plantation.

By this means, outgrowers would come into possession of "ready made" Tea, and would thus be saved the uncertainty of knowing (because of no previous experience) whether the waiting period of 3 - 4 years whilst their Tea plants were coming into production, would be worthwhile.

It is felt that this would give the necessary impetus to making the growing of Tea popular amongst the Small Farmer. Details of this proposal are given in Chapter 13.
15. It is felt that this would give the necessary impetus to making the growing of Tea popular amongst the Small Farmer. Details of this proposal are given in Chapter 13.

16. Jimma is another area where the writer considers could be made popular for Small Farmer's Tea.

17. The inhabitants know that Tea will grow because they have the evidence before their eyes, and it would only be a matter of time before they heard of the large Plantations in Bonga.

18. Large Plantations are unlikely to be established in Jimma because of the lack of State Domain land, and it would certainly not be economical to purchase privately owned land for this purpose.

19. If however, the Department of Agriculture could create sufficient enthusiasm amongst Small Farmers in the Jimma area to plant say 200 – 250 hectares of Tea, the construction of a small Factory either by private enterprise or by the Co-operative Society, would create a very attractive investment.

20. The Tea Industry would then be developing along three separate lines, viz:

   a. Large Plantations with surrounding Outgrowers in the Bonga Area.

   b. Large Plantation with Outgrower participation in the Gore Area.

   c. Outgrowers and Small Tea Farmers selling their green leaf to a privately owned or co-operatively owned Factory in the Jimma Area.
CHAPTER 12

PROBABLE GROSS INCOMES TO OUTGROWERS AND SMALL TEA FARMERS

1. Throughout the tour the writer has found it quite impossible to get any accurate information of Farmer's incomes which have been derived from Coffee. The figures supplied by the Coffee Board, the Department of Agriculture and from the Farmers themselves have been so conflicting that no reliance can be placed on them.

2. The reason probably is of the number of Middlemen through whose hands the Coffee passes between the grower and the Coffee Board.

3. On the other hand if the Small Farmer is to be persuaded to change from Coffee to Tea, it is only natural that he should be given some indication of his probable income from this new source.

4. The writer has, therefore, endeavoured in the accompanying table, to give some idea of what a grower or Small Farmer may expect.

5. It should be understood that the figures are for gross incomes and no account has been taken of possible mortgage repayments or even the initial cost of planting material.

6. However as a rough guide the cost of producing a Tea stump of 18 months old, including the cost of seed, should be between Eth $0.07 - 0.08 cents per stump.

7. Assuming a planting density of 10,000 plants per hectare and allowing a casualty replacement figure of 20% during the first 4 years. The cost of planting material should then be somewhere between Eth. $840 - 960 per hectare.
8. The plants should begin to earn revenue between the 3rd and 4th year, and, if properly cared for, should be producing between 4,000 - 5,000 kgs. green leaf per hectare per annum by the 6th and 7th year.

9. It is considered that a family of 5, all of working age, should be able to successfully work from 2 to 2 ½ hectares of Tea.

10. Once the holding becomes larger than 2 ½ hectares, it would probably be necessary to hire outside labour during certain seasons of the year.

11. The statement of incomes should be taken as a guide only. In the event, the writer would not be surprised if the cost of processing was found to be on the high side and the yields on the low.
### SHOWING PROBABLE GROSS INCOME PER HECTARE FOR OUTGROWERS GREEN TEA LEAF SOLD TO FACTORIES FOR PROCESSING

Based on varying price of black tea on world markets and on varying yields.

<table>
<thead>
<tr>
<th>PRICE OF BLACK TEA</th>
<th>Per lb.</th>
<th>Per kg.</th>
</tr>
</thead>
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<tr>
<td></td>
<td>(3/6)</td>
<td>E$2.80</td>
</tr>
<tr>
<td></td>
<td>(4/-)</td>
<td>E$3.08</td>
</tr>
<tr>
<td></td>
<td>(4/6)</td>
<td>E$3.46</td>
</tr>
<tr>
<td></td>
<td>(5/-)</td>
<td>E$3.84</td>
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<td>(5/6)</td>
<td>E$4.23</td>
</tr>
<tr>
<td></td>
<td>(6/-)</td>
<td>E$4.61</td>
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#### ESTIMATED COST OF PROCESSING

- Factory Profit 30%
- Cost of Green Leaf
- Pay for Green Leaf

(Ratio Black Tea to Green Leaf = 23%)

<table>
<thead>
<tr>
<th>Estimated Annual Gross Income Per Hectare</th>
<th>Per kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Yielding 840kgs.M.T. per H. (approx. 750 lbs. M.T.P.a.) (equivalent to 3650 kgs. G.L. per H. at 23% M.T./G.L.)</td>
<td>E$1898.00</td>
</tr>
<tr>
<td>B. Yielding 1125kgs.M.T. per H. (approx. 1000lbs.M.T.P.a.) (Equivalent to 4890kgs.G.L. Per H. at 23% M.T./G.L.)</td>
<td>E$2542.80</td>
</tr>
<tr>
<td>C. Yielding 1345kgs.M.T. Per H. (approx. 1200lbs.M.T.P.a.) (equivalent to 5850kgs. G.L. per H. at 23% M.T./G.L.)</td>
<td>E$3042.00</td>
</tr>
</tbody>
</table>

/continued
TABLE I (Continued)

MONTHLY AVERAGE GROSS INCOME PER HECTARE (12 months)

<table>
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<th></th>
<th>E$</th>
<th>E$</th>
<th>E$</th>
<th>E$</th>
<th>E$</th>
<th>E$</th>
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<tbody>
<tr>
<td>A</td>
<td>158.17</td>
<td>179.46</td>
<td>206.82</td>
<td>231.17</td>
<td>258.54</td>
<td>285.91</td>
</tr>
<tr>
<td>B</td>
<td>211.90</td>
<td>240.42</td>
<td>277.10</td>
<td>309.70</td>
<td>346.38</td>
<td>383.05</td>
</tr>
<tr>
<td>C</td>
<td>256.50</td>
<td>287.62</td>
<td>331.50</td>
<td>370.50</td>
<td>414.35</td>
<td>456.25</td>
</tr>
</tbody>
</table>

Rate of Exchange E$1.00 = 2s. 10½d.
1 Hectare = 2.47 acres
1 Kilo = 2.20 lbs.
CHAPTER 13

THE ETHIOPIAN TEA DEVELOPMENT CORPORATION

1. It is recommended that legislation be enacted establishing "The Ethiopian Tea Development Corporation Share Company".

2. The authorised capital of the Corporation to be E$3,500,000.-

3. It is suggested that finance be raised as follows:
   a. From Ethiopian Sources E$2,100,000.-
   b. From International Sources E$1,400,000.-
   E$3,500,000.-

4. It is suggested that the finance raised from Ethiopian Sources should be in the form of Equity Capital comprising 21,000 shares, each of E$100.-. This will enable the local investor to participate in the development and profits of the Tea Industry in Ethiopia.

5. It is recommended that the Corporation should be an independent and autonomous body subject to direction only by the Minister.

6. The Corporation should have the backing of His Imperial Majesty's Ethiopian Government to negotiate loans from such sources as:
   a. The International Bank of Reconstruction and Development
   b. Other Development Corporations
   c. Foreign Countries
   d. Ethiopian Investment resources

7. The Corporation should have power to acquire land to accommodate buildings, Factories, Nurseries, growing Tea and Timber, and for such other purposes connected with its workings.

8. The Corporation should have power to enter into negotiations and contracts, to sue and to be sued.
9. The objects of the Corporation are:

a. To acquire suitable State Domain Land in the vicinity of Gore, Illubabor Province and to establish at least 10 gashas of Tea, complete with Factory, Buildings, roads, electricity and water supplies, etc. etc. on a Plantation Basis.

b. To work the Corporation on a strictly Commercial Basis.

c. When the Tea has matured, to divide and sell to selected outgrowers at agreed terms about 5 gashas of Tea divided into 1 and 2 hectare blocks, thus creating Small Farmer participation in the prosperity of the Corporation.

10. The Board of Directors should consist of:

a. An Independent Chairman who shall have wide commercial experience.
   (To be appointed by the Minister of Agriculture)

b. A Representative from the Ministry of Finance

c. A Representative from the Ministry of Commerce and Industry

d. A Representative of the Ethiopian Investment Interests

e. A Representative of the Foreign Investment Interests

f. The General Manager of the Corporation
   (The Secretary of the Corporation should be the Assistant General Manager).

11. The chief Executive Officers should be:

a. The General Manager

b. The Assistant General Manager.
   (Note - these two officers should also be the General Manager and the Assistant General Manager respectively of the Ethiopian Tea Authority).
12. The General Manager, subject to the direction of the Board of Directors, shall direct the Management of the Corporation. He may delegate such of his functions duties and authority to such persons employed by the Corporation as he may deem appropriate for the efficient management of the Corporation.
CHAPTER 14

ESTIMATED CAPITAL EXPENDITURE IN DEVELOPING
THE ETHIOPIAN TEA DEVELOPMENT CORPORATION PLANTATION

AT GORE - ILLUBABOR PROVINCE

1. The difficulties of accurately estimating the Capital cost of an undertaking of this nature are:
   
   a. It has not been done before in Ethiopia and consequently there are no precedents upon which to work.

   b. The cost of casual labour at £31. per diem is higher than in either Kenya or Uganda and moreover their output of work, in terms of kilos of processed Tea, is an unknown factor.

   c. There appears to be a serious shortage of semi-skilled and skilled workers such as masons, bricklayers, blacksmiths, carpenters and the like.

   d. The salaries paid to minor members of the staff such as clerks, typists, watchmen etc. are higher in Ethiopia than in neighbouring Tea growing countries.

2. As the "cost of labour" element is approximately between 60-65% of the total cost of production, it is likely that the overall production, it is likely that the overall production costs could be higher in Ethiopia than elsewhere.

3. This is a matter however that will only be decided by time, but it does mean that from the very beginning, the strictest economy coupled with the highest efficiency must be sustained, if Ethiopia is to compete successfully with her neighbours.

4. Having regard to the above factors the following is the estimated cost of opening and bringing into production the Plantation in Gore:
a. Cost of 20 Gashas at E$30.00 per gasha  
   E$ 600.00

b. Clearing and planting 10 Gashas of Tea  
   including cost of planting material  
   E$1,050,000.00

c. Maintenance for three years  
   E$ 700,000.00

d. Buildings  
   E$ 245,000.00

e. Roads and Soil conservation  
   E$ 140,000.00

f. Factory Stages I, II and III  
   E$1,225,000.00

   E$3,360,600.00

Contingencies say  
E$ 139,400.00

Grand Total:  
E$3,500,000.00

(Equivalent to E$8,750.00 per Hectare)
(of the above it is estimated that approximately  
E$3,400,000.00 would be in foreign exchange).
TABLE 2 SHOWING DATES FOR NURSERY AND FIELD PLANTINGS

TOGETHER WITH ESTIMATED DATES OF CROPPING AND PROBABLE YIELDS

(NOTE - It is customary to allow 5 years for a Tea Plant to commence bearing - however with the forcing climate in Ethiopia, this time may be reduced by 12 months - earlier production could also be obtained by the use of Vegetative Techniques in place of seed).

ESTIMATED YIELD PROGRESSION

<table>
<thead>
<tr>
<th>Year in Bearing</th>
<th>Estimated Yields:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Year.</td>
<td>250 kgs. per Hectare</td>
</tr>
<tr>
<td>2nd Year.</td>
<td>500 kgs. per Hectare</td>
</tr>
<tr>
<td>3rd Year.</td>
<td>875 kgs. per Hectare</td>
</tr>
<tr>
<td>4th Year.</td>
<td>1250 kgs. per Hectare</td>
</tr>
<tr>
<td>5th Year.</td>
<td>1500 kgs. per Hectare</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seed in Nursery Year</th>
<th>Plant in Field Year</th>
<th>Area Hectares</th>
<th>Commence Cropping Year</th>
<th>Estimated Yields kgs.</th>
<th>Estimated Annual Year kgs.</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>1969</td>
<td>20</td>
<td>1972</td>
<td>20x250</td>
<td>5,000</td>
<td>1972</td>
</tr>
<tr>
<td>1968</td>
<td>1970</td>
<td>40</td>
<td>1973</td>
<td>20x500 (40x250)</td>
<td>20,000</td>
<td>1973</td>
</tr>
<tr>
<td>1969</td>
<td>1971</td>
<td>80</td>
<td>1974</td>
<td>20x875 (40x500)</td>
<td>57,500</td>
<td>1974</td>
</tr>
<tr>
<td>1970</td>
<td>1972</td>
<td>100</td>
<td>1975</td>
<td>20x1250 (40x875)</td>
<td>125,000</td>
<td>1975</td>
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</table>

Factory Stage I

Factory Stage II

/continued
<table>
<thead>
<tr>
<th>Seed in Nursery Year</th>
<th>Plant in Field Year</th>
<th>Area Hectares</th>
<th>Commence Cropping Year</th>
<th>Estimated Yields kgs.</th>
<th>Estimated Annual Year kgs.</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>1973</td>
<td>100</td>
<td>1976</td>
<td>20x1500</td>
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<td>40x1250</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>60x875</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>100x500</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100x250</td>
<td>225,000</td>
<td>1976</td>
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<tr>
<td>1972</td>
<td>1974</td>
<td>60</td>
<td>1977</td>
<td>60x1500</td>
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<td>80x1250</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td>400</td>
<td></td>
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<td>100x875</td>
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<td>10 Gashas</td>
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<td></td>
<td></td>
<td></td>
<td>60x500</td>
<td>452,500</td>
<td>1978</td>
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<tr>
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<td></td>
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<td>240x1500</td>
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<td></td>
<td>100x1250</td>
<td></td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td>60x875</td>
<td>537,500</td>
<td>1979</td>
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<td>340x1500</td>
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<td>60x1250</td>
<td>585,000</td>
<td>1980</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>400x1500</td>
<td>600,000 kgs.</td>
<td>1981</td>
</tr>
</tbody>
</table>

CHAPTER 15

SUGGESTED PROGRAMME FOR THE SETTING UP OF
THE ETHIOPIAN TEA AUTHORITY AND
THE ETHIOPIAN TEA DEVELOPMENT CORPORATION
TOGETHER WITH A SUGGESTED PROGRAMME OF WORKS
IN CONNECTION WITH THE PROPOSED PLANTATION
IN GORE-ILLUBABOR PROVINCE

1966

1. Enact legislation convening the Ethiopian Tea Authority.
2. Convene the Ethiopian Tea Development Corporation.
3. Recruit 2 Experienced Expatriate personnel.
4. Recruit necessary Ethiopian staff.
5. Acquire 15 gashas State Domain land in the Gochi Forest 5-8 km. from Gore in the vicinity selected.
6. Arrange for an aerial survey of the area.
7. Purchase from Kapwarren Estate P.O. Kaimosi - Kenya 10 kgs. tea seed for distribution to the trial Tea blocks in the Awash and Lekempti areas.
   (Note - The writer placed a firm order for the seed on 19.11.65. whilst in Kenya, for delivering in April-May 1966).
9. Order one D8 Bull Dozer for 1967 Delivery (January-February)
   (Note - The purchase of this machine might be avoided if it is possible to find suitable contractors to clear the forest)
11. Provide 2 Land Rovers for Executive staff.
13. Order necessary Tools etc.

1967

(The following is a rough outline of work to be undertaken on the Plantation in Gore, and is based on the assumption that the Highway will reach Gore during 1969-70).

1. Build temporary residence for the General Manager.
2. Build temporary residence for the Assistant Manager.
3. Build temporary residence for the staff.
4. Build temporary Office and Store Rooms.
5. Build 50 dwellings for labourers (temporary structures).
6. Prepare nurseries by April to receive 600 kgs. Tea seed.
7. Commence making the road from Plantation to Gore.

1968

1. Build 50 dwellings for labourers (temporary structures).
2. Complete road from Plantation to Gore.
3. Prepare nurseries by April to receive 1200 kg. Tea seed.
4. Clear and prepare for planting 20 Hectares Forest
5. Order 2400 kilos tea seed for April - June delivery 1969.
1969

1. Build 50 dwellings for Labourers (temporary structures).
2. Prepare Nurseries by April to receive 2400 kgs. Tea seed.

1970

1. Build 50 dwellings for Labourers (temporary structures).
2. Prepare Nurseries by April to receive 3000 kgs. Tea seed.
4. Prepare specifications and call for tenders for Factory (Stage I) with a capacity of 250,000 kgs. Tea per annum.

1971

1. Build and complete Factory Stage I and ancilliary Buildings.
2. Build 50 dwellings for Labourers (temporary structures).
3. Prepare Nurseries by April to receive 3000 kgs. Tea seed.
1972
1. Build Permanent Residence for General Manager.
2. Build Permanent Office and Store Rooms.
8. Clear 20 Hectares Forest for fuel and re-forest with Eucalyptus.

1973
1. Build Permanent Residence for the Assistant General Manager.
2. Build Permanent Residences for Staff.
4. Commence cropping 1970 Planting (40 Hectares.)
5. Plant 100 Hectares in Tea.
7. Clear 20 Hectares Forest for fuel and re-forest with Eucalyptus.
8. Build school and dispensary for Labourers.

1974
1. Build 50 Permanent Dwellings for Labourers.
2. Commence cropping 1971 Planting (80 Hectares).
3. Plant 60 Hectares of Tea.
4. Clear 20 Hectares Forest for fuel and re-forest with Eucalyptus.
5. Prepare specifications for Factory development Stage II.
1975

1. Build 50 Permanent dwellings for Labourers.
2. Commence cropping 1972 Planting (100 Hectares).
3. Clear 20 Hectares Forest for fuel and re-forest with Eucalyptus.
4. Increase Factory, Stage II, to a capacity of 500,000 kgs. per annum.

1976

1. Build 50 Permanent dwellings for Labourers.
2. Commence cropping 1973 Planting (100 Hectares).
3. Clear 20 Hectares Forest for fuel and re-forest with Eucalyptus.
4. Prepare specifications for Factory development Stage III.

1977

1. Build 50 Permanent Dwellings for Labourers.
2. Commence cropping 1974 Planting (60 Hectares).
3. Increase Factory Stage III to a capacity of 750,000 kgs. per annum.
CHAPTER 16

GENERAL INSTRUCTIONS FOR THE OPENING UP OF
THE PLANTATION IN GORE ILLUBABOR PROVINCE

1. All trees should be felled in such a way as to bring as much of their root system to the surface as possible.

2. The ground should then be raked and cleared of all large roots to a depth of 60 cms.

3. Drains of the lock and spill variety at gradients of 1:20 are recommended in place of bunds.

4. Leader drains should be stone bunded, if stone is available, otherwise stepped.

5. Roads - As a rough guide, there should be 1 km. of road to 15 Hectares of Tea. It should be remembered that the policy of the Corporation is to ultimately divide off the perimeter of the plantation into units of 1 and 2 Hectare blocks for sale to Outgrowers, and easy access to these areas will be required. A visit to the Agricultural project at Wollamo Sodo would be helpful. As road surfacing is bound to be a problem, grassing over the road, to prevent erosion might be tried out.

6. Planting Density - The recommended planting density is 10,000 Plants per Hectare as a control of the INGICHA GRASS pest.

7. The Tea should be planted in contour rows between the drains.

8. Shade Trees - At the elevation of CORE, shade trees, per se, are not recommended. What is recommended are wind beats comprising double rows of MAKEE SALIGMA (PROTEACECA)
planted across the prevailing winds. Suggested spacing is 50-75 m, though these figures may need revising in the light of experience.

9. **Labour** – Women should be encouraged and trained from the very start to pluck Tea, in preference to men. Only by this means will a high standard of plucking be achieved.

10. **Labourers Dwellings** – When the time comes to build permanent Labourers Dwellings (vide programme of works) consideration should be given to siting these so that they can be sold to Outgrowers along with the individual blocks of Tea mentioned in paragraph 5.

11. **Fertilizers** – No recommendation concerning fertilizer applications are made at this stage. This may be done at a later date.

12. For efficient working, it is recommended that the size of Tea Fields should be kept at 10 Hectares.
CHAPTER 17

ETHIOPIAN TEA CORPORATION - CORE

SUGGESTED FACTORY REQUIREMENTS

STAGE I 1971 (Capacity 250,000 kgs. per annum) See Note

SITE CUTTING - Prepare a site 160m.x70m. which will accommodate the complete Factory after Stage III.

BUILDING - ERECT 21 bays 17'6x110'

Comprising:

6 Bays to hold 11 Troughs
3 Bays for Rolling
2 Bays for Firing
3 Bays for Sorting and Packing
1 Bay for Green Leaf Reception Area
6 Bays for Extensions Stage II and III

21

MACHINERY

WITHERING

11 Troughs
1xNo. 10 SCD Heater
1x15' I.D. Fan
1 STUB Masonry Chimney
1 Withered Leaf Band Conveyor
1 GL Monorail Conveyor
1x36' Circular Saw

ROLLING

1x8' Rotovane
1x15' Rotovane
1 Sifter with Ball Breaker
1 Sifter
FIRING

1xNo.10 SCD Heater
1x6' Two Stage Drier
1 I.D. Fan
1 STUB Masonry Chimney

PACKING AND SORTING

1 Nissen Sorter
1 Winnower
1 Weighing Machine
1 Packer
1 Ventilating Fan
4 Tea Bins (750 kilos each)

POWER

2x50 K.V.A. Generating Sets
Switch Boar

ANCILLARY BUILDINGS

Managers Office
Switch Room
Engine Room
Heater Room for Trough Withering
2 Firewood Bins

STAGE II 1975 (Capacity 500,000 kgs. per annum)

WITHERING

6 Troughs

ROLLING

1x8' Rotovane
1 Sifter with Ball Breaker

FIRING

1xNo.10 SCH Heater
1x6' Two Stage Drier
SORTING
4 Tea Bins (750 kilos each)

POWER
1x50 K.V.A. Generator
Switch Board

STAGE III 1977 (Capacity 750,000 kgs. per annum)

WITHERING
5 Troughs

ROLLING
1x15 Rotovane
1 Sifter

NOTE: An additional 25% Factory Capacity has been provided to process Green Leaf Grown by Outgrowers.
### CHAPTER 18

#### THE MARKETING OF TEA

1. **Imports of Tea into Ethiopia**

   The value of Tea imported into Ethiopia was:
   
   - 1962 - E£1,688,000
   - 1963 - E£1,729,000

2. The breakdown of the 1963 imports is as follows:

<table>
<thead>
<tr>
<th>Kilos</th>
<th>Total Value £</th>
<th>Value per Kilo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>968</td>
<td>1,951</td>
</tr>
<tr>
<td>Somalia</td>
<td>47</td>
<td>135</td>
</tr>
<tr>
<td>Netherlands</td>
<td>200</td>
<td>798</td>
</tr>
<tr>
<td>W. Germany</td>
<td>291</td>
<td>625</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>3,044</td>
<td>22,146</td>
</tr>
<tr>
<td>U. S. A.</td>
<td>52</td>
<td>769</td>
</tr>
<tr>
<td>Aden</td>
<td>84</td>
<td>185</td>
</tr>
<tr>
<td>India</td>
<td>62,070</td>
<td>206,720</td>
</tr>
<tr>
<td>China Mainland</td>
<td>8,793</td>
<td>14,170</td>
</tr>
<tr>
<td>Ceylon</td>
<td>524,923</td>
<td>1,475,844</td>
</tr>
<tr>
<td>Formosa (Thaiwan)</td>
<td>3,405</td>
<td>4,971</td>
</tr>
<tr>
<td>Unspecified</td>
<td>82</td>
<td>360</td>
</tr>
<tr>
<td>Total:</td>
<td>604,259</td>
<td>1,728,674</td>
</tr>
</tbody>
</table>

   India & Ceylon combined: 586,993 £ 1,682,564 £ 2.86

3. **Import Duty**

   (as per Legal Notice 239 of 25 November, 1964).

   - On Tea in Bulk: £3. - per kilo
   - In packets or tins: £3.50 per kilo
   - Plus Federal Tax 12%
   - Ad valorem c.i.f.
   - Municipal Tax 1%
4. The following Brands of Teas at the prices noted were available in the Addis Ababa shops at the time of this Report:

<table>
<thead>
<tr>
<th>BRAND</th>
<th>PRICE</th>
<th>WEIGHT</th>
<th>EQUIVALENT PRICE PER KILO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Brooke Bonds</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Red Label</td>
<td>3.00</td>
<td>½</td>
<td>13.20</td>
</tr>
<tr>
<td>Green Label</td>
<td>2.60</td>
<td>½</td>
<td>11.44</td>
</tr>
<tr>
<td>b. Gellatly Hankey &amp; Co. (Ceylon)</td>
<td>1.00</td>
<td>¼</td>
<td>8.80</td>
</tr>
<tr>
<td>c. Liptons No. 1</td>
<td>1.65</td>
<td>¼</td>
<td>14.52</td>
</tr>
<tr>
<td>Liptons No. 1</td>
<td>5.85</td>
<td>1</td>
<td>12.87</td>
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<tr>
<td>Liptons Yellow Label</td>
<td>5.00</td>
<td>not stated</td>
<td>-</td>
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<tr>
<td>d. Melrose</td>
<td>55c</td>
<td>20 grms.</td>
<td>27.50</td>
</tr>
<tr>
<td>- 10 Tea Bags</td>
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<td></td>
</tr>
<tr>
<td>e. Fir Hill (Ceylon)</td>
<td>.90</td>
<td>¼</td>
<td>7.92</td>
</tr>
<tr>
<td>f. Twinings</td>
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<tr>
<td>Ceylon Breakfast</td>
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<tr>
<td>Earl Grey</td>
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<td>Prince of Wales</td>
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<td>Lapsang Souchong</td>
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<td>Formosa Oolung</td>
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<td>Keemum Tea</td>
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</tr>
<tr>
<td>g. Right Time Tea</td>
<td>.35</td>
<td>30 grms.</td>
<td>11.67 per bag</td>
</tr>
<tr>
<td>- 24 Tea Bags</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Lyons Tea de luxe</td>
<td>5.50</td>
<td>not stated</td>
<td>-</td>
</tr>
<tr>
<td>- 100 Tea Bags</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. China Green Tea</td>
<td>2.50</td>
<td>100 grms.</td>
<td>25.00</td>
</tr>
</tbody>
</table>

5. It will be appreciated, from a study of the figures in paragraphs 2, 3 and 4 that:

a. Tea in Ethiopia almost qualifies as a luxury drink and
b. The exceedingly high price is by no means entirely due to the high Import Duty and Federal Tax.
6. Assuming a production of 1500 kilos per hectare, it will be seen from the total imports of Tea into Ethiopia in 1963, that an area of some 402 Hectares would be sufficient to supply the whole of the country's annual present consumption. This is the size of the proposed Plantation in Gore.

7. It is suggested that the Ethiopian Tea Development Corporation should make every effort to capture the local market, though it is not recommended that it should enjoy any form of protection or concession not available to its competitors.

8. This should enable the local price of Tea to be drastically reduced and thus encourage increased consumption.

9. If the entire local market were supplied from indigenous sources the Treasury might consider it necessary to make good the loss of Revenue amounting, presently, to some £2,000,000 per annum.

10. However it must be pointed out that apart from the saving of Foreign Exchange, the advent of a new Industry such as Tea inevitably creates a demand for such minor industries as, transportation, carpentry, blacksmithys, building, etc. whilst the large sums paid out monthly by Plantations in the form of wages, quickly attracts a host of petty traders.

   All this helps to generate wealth which in time becomes taxable, thus making good the loss in Revenue from Tax on Tea Imports.

11. It is to be hoped, therefore that the Treasury will not seek to kill the Goose before it has laid the Golden Egg, and refrain from levying dues or taxes until it can be seen that the Tea Industry is on a profitable basis.
12. For the purposes of record, the following are the rates of Export and Excise Duties levied by Ceylon, India and Pakistan in 1963.

Attention however is drawn to the fact that Teas produced in African Countries, with which Ethiopian Teas would compete mostly, are exempt from all such levies.

a. **CEYLON** (converted to Ethiopian currency)
   - **Export Duty** - E£0.40 cents per kilo
   - **Export Cesses** - £0.09.3 cents per kilo
   (Note: The Income derived from the cesses finances Advertising - Research, and the replanting subsidies).
   - **Excise Duty** - Nil

b. **INDIA**
   - **Export Duty** - Nil
   - **Export Cesses** - 33.02.3 cents per kilo
   - **Excise Duty** - £30.21 cents per kilo

c. **PAKISTAN**
   - **Export Duty** - £0.04.5 cents per kilo
   - **Export Cesses** - £0.02.3 cents per kilo
   - **Excise Duty** - £0.70 cents per kilo

(Excise Duties are refunded on Teas exported).

13. It is recommended that the Ethiopian Tea Industry should be protected from any possible dumping of cheap Teas on the local market by the continuance of the Existing Import Duty and Federal Taxes for an indefinite period.

14. **Export of Corporation Teas**

   To begin with, it is recommended that Teas which are available for export should be despatched for sale on the London market. This is by far and away the largest Tea market in the world, it therefore attracts the most
buyers, and results in the keenest prices to the benefit of the Producer.

Details concerning this may be arranged at a later date.
CHAPTER 19

TEA ADVISORY SERVICE

1. One of the responsibilities of the Ethiopian Tea Authority will be to provide an Advisory Service to instruct the Outgrower and Small Tea Farmer in the latest techniques of growing Tea.

2. To form a nucleus of this service, it is recommended that 3 officers from the Ministry of Agriculture, might be seconded to the E.T.A., and sent to the Tea Research Institute in Ceylon for a period of Training lasting 6 weeks, and finally to the Kenya Tea Development Authority for a period of 6 months. (Note: When the writer recently visited Kenya he discussed this matter with the General Manager of K.T.D.A., who agreed to the suggestion.)

3. Assistance in this matter should be obtained from the U.K. Ministry of Overseas Development through the usual channels.

4. On the return of these officers, the Chief Executive Officer of the E.T.A. should arrange short courses for Outgrowers and Small Holders on much the same lines as is now done by the K.T.D.A. in Kenya.

5. At a later date (say by 1970) it is further recommended that two Ethiopian officers of the E.T.A. be sent to London for a six months period of training in Tea Testing and Tea Marketing with one of the leading firms of Tea Brokers. This could be arranged by the writer in co-operation with the Ministry of Overseas Development.
CHAPTER 20

THE DRYING OF TEA BY FIREWOOD FUEL

1. In a country where the Eucalyptus and Acacia Tree flourish and where there is ample land available, the writer strongly recommends that it should be obligatory on all Factory Owners to use firewood for the withering and drying of their Tea in preference to liquid fuel.

2. The advantages of solid (firewood) over liquid fuel are:
   a. It saves foreign exchange.
   b. It is considerably cheaper (see attached table).
   c. It creates employment.
   d. It conserves the afforestation of the country.

3. In the case of Plantations, it should be obligatory to assign an area equivalent to 12% of the area under Tea for the planting of fuel trees preferably Eucalyptus. If properly cared for and correctly coppiced, this area should supply the Plantation with fuel for all time.

4. In the case of Factories which may be erected for the purpose of processing leaf grown by Outgrowers and Small Farmers, it should be obligatory for the Owner to plant in Eucalyptus, 40 Hectares for every 250,000 kilos capacity of the Factory or part thereof.

5. From his personal knowledge, the writer is able to quote numerous instances where through lack of foresight, Plantation Owners have been obliged to install expensive oil-fired equipment because their reserves of firewood were exhausted.

6. Two instances will suffice:
   a. In Malawi where the Eucalyptus thrives almost as well as in Ethiopia, a Plantation, having
APPENDIX I

METHODS OF GERMINATING TEA SEED & INSTRUCTIONS FOR PLANTING GERMINATED SEED INTO NURSERY BEDS AND/OR POLYTHENE SLEEVES

1. It is suggested for comparison purposes that half of the seed should be grown in Nursery Beds, as stumps, and half should be grown as seedlings in polythene tubes.

2. On receipt of the seed, there should be no delay in placing it into germination beds. It should be remembered that the seed has probably been a number of days in transit and unless carefully packed with charcoal is liable to deterioration after a few weeks.

3. Germination beds or frames should be approximately 3 meters long and 2 meters wide for easy working.

4. The area selected should be close to water.

5. The beds or frames should be made as follows:
   a. Excavate the soil to the depth of 16-18 cms. and lay down a rebble bed of 12cms. for good drainage.
   b. On top of the rebble place a layer of earth from 5-8 cms. in depth.
   c. On top of the earth lay a bed of gravel or sand to a depth of 4-6 cms.

6. The seed should be laid on the gravel, each seed touching the next and gently pressed into the gravel.

7. Cover the seed with 2 cms. of sand/gravel.

8. Dampen the sand, by light watering, but do not soak.
9. Place sacking over the seed bed, and cover all over with bracken fern or other substance to exclude day light.

10. For the next week or ten days keep the sacking moist (not wet) by light watering.

11. Between the 7th-10th day examine the seed (starting from one end of the bed or frame) by removing the top layer of and seed.

12. Seed which has cracked should be removed for planting into the Nursery.

13. Uncracked seed should be recovered with sand.

14. Carry out this inspection on alternate days, removing all cracked seed to the Nursery, until it is obvious that no more seed will germinate.

15. Assess the percentage of germination.

Nurseries and Polythene Tubes

1. Nurseries

   Should comprise areas of good virgin soil and should be sited within easy access of water and road.

2. The ground should be terraced, if on the slope, to provide good drainage, and dug down to the depth of \( \frac{3}{4} \) m. and all stones and weeds removed.

3. Beds should be as long as convenient but not wider than 1 meter for ease of working.

4. Germinated seeds should be planted in the bed at approximately 15x15 cm. spacing at a depth of 3-4 cms; and in plots of 100 for easy checking.
5. Be careful to see that the cracked side of the seed is planted downwards. This is most important, because through the cracked outer-shell the tap root emerges.

6. Shade the bed with fern or similar material. Alternatively construct a canopy of screens over the whole Nursery area at a height of 2 meters. Light should be filtered, avoid over-shading.

7. Keep the ground damp by light daily waterings.

8. Keep the beds free of weeds.

**Polythene Tubes**

1. Polythene tubing approximately 12 cms. diameter is sold in rolls of 50x100 meters.

2. The tubing should be cut into sections of approximately 30 cms. and closed at one end with 2 office staples about 4 cms. apart. This will permit adequate drainage.

3. The tubes should be filled with good top soil, which has been sifted to exclude stones.

4. The ground on which the tubes are to be placed, preferably alongside the Nursery beds, should be forked and loosened to permit possible tap root penetration.

5. Tubes should be stacked in squares of 100, for easy checking, and around the perimeter of the squares, earth should be to the height of the tubes to prevent drying.

6. One germinated Tea Seed, with the cracked portion facing downwards, should be planted in each tube at a depth of 3-4 cms. (Note: if there is a surplus of seed, two germinated seeds may be planted in each tube.)

7. The tubes should be kept free of weeds, shaded in the same manner as the Nursery beds, and watered regularly, but not soaked.

8. At all stages very careful records of cost should be maintained.
APPENDIX II

INSTRUCTIONS FOR THE SELECTION OF "MOTHER BUSHES",
THE LAYING DOWN OF CUTTING FOR
VEGETATIVe PROPAGATION,
AND THE PLANTING OF V.P. PLANTS INTO THE FIELD

1. The most sought after characteristics of a good "Mother Bush" from which cuttings may be taken for propagation are:-
   a. Good Fermentation
   b. Wide spreading and deep rooting systems to enable the bush to withstand drought.
   c. High number of Plucking points.
   d. The "flush" makes good Tea.

   Unfortunately, the Scientific research for a bush containing all the above characteristics may take many years.

2. Much, however, can be done quickly, by visually selecting a prime bush, growing among other bushes, which appears to "Stand Out" in vigour and vitality for no apparent reason.

3. By "apparent reason", it is meant that the selected bush is not growing on the edge of a road or drain where it receives extra light, nor are its roots in a packet of exceptionally good soil, nor does it appear to enjoy favourable conditions compared to other bushes.

   If such a bush can be found, and it proves to be a good "fermenter" (vide Appendix III) then it may be reasonably assumed that the remaining characteristics, mentioned above, are present.

4. It is generally accepted that a bush which is a good "fermenter" will ipso facto, produce good Tea, though the opposite does not always follow.
5. The thing to make certain of therefore, is that the "visually" vigorous bush is also a good "fermenter."

6. When such a bush has been discovered it should be clearly marked and protected by a fence.

7. The bush should be pruned, or cut across at about 70 cm. and then allowed to recover until the new branches are about 60-75 cm. above the pruned level.

8. **V.P. CUTTINGS**

   It is likely, in the forcing climate of Ethiopia, that it will take from 7-9 months for a V.P. cutting to have grown into a plant large enough to be transferred to the field.

9. If therefore, the planting season is in May, cuttings should be taken from the "mother" bush during August and November of the previous year.

10. Three weeks before the time comes to take the actual cuttings, the "Mother Bush" should have the "flush" (two leaves and bud) removed. This will permit new shoots to grow from the nodes down each branch and ensures quicker growth in the callousing Beds.

11. A very sharp knife is needed to make the cuttings.

12. The point of actual cutting on the branch of the "Mother" Bush is where the green turns to brown, and this point will be found some 4-6 leaves down, counting from the top.

13. The cut branch should be placed immediately in a bucket of water and kept fresh.

14. Simultaneously a "callousing" bed should have been prepared. This consists of a bed of soil some 2-3 meters long and 1 meter wide consisting of a brown/red soil possessing
a good crumb structure (this is important). It should be some 15-20 cms. deep and, to ensure good drainage, the ground below the bed should have been cut away a further 15-20 cms. and filled with rubble.

The bed should be covered over by a bamboo or other suitable roof about 60 cms. off the ground, and around four sides there should hang a curtain of sacking or jute.

15. When the branches are brought from the Mother Bush, the cuttings should be prepared. A cutting comprises one leaf plus the annode to within 1 cm. of the node below. It requires skill to make "cuttings" in which neither the leaf nor the stem are damaged.

16. As the cuttings are prepared, they should be kept in water until they are placed in the callousing bed.

17. When all is ready, the cuttings are then taken to the callousing bed and the stems are firmly placed in the soil at an angle which permits the mid-rib of the leaf to rest horizontally on the ground. The node should on no account be covered with soil, but the soil pinched firmly between finger and thumb below the node.

18. The "cuttings" may be placed in the callousing beds with the leaves just touching, thus making it possible to have many hundreds of cuttings in a small area.

19. The bed should now be kept constantly damp (not wet) and made as dark as possible.

20. The bed should be inspected weekly and any weed growth removed. At the end of 40-60 days callousing will have commenced and at the end of 90 days there should be a mass of roots from 2-3 cms. long, and in all probability the cutting will also have grown a shoot of one or two leaves.
21. The cutting is now ready to be transferred into polythene tubes.

22. These tubes should be approximately 12 cms. in diameter and some 
25-30 cms. in length.

23. The lower half of the tube should have small holes about 5 cms. apart 
for drainage, and the base of the tube should be sealed in the middle only 
(ofice staples do admirably) leaving the two ends at the bottom free for 
drainage purposes.

24. The tubes should be filled with good quality top soil. Probably the 
best soil for cuttings is that which is obtained from beneath grass, parti­
cularly Guatanala grass. The grass roots should not be sifted out as they 
help the soil to remain aerated.

25. The method of planting a rooted cutting into a tube is as follows:-

The tube should be half filled with soil, one person should 
hold the cutting so that the primary node is just clear of 
the top of the tube and, with the roots of the cutting hanging 
freely downwards, a second person should fill the remainder of 
the tube with soil pressing the cutting firmly but gently into 
the soil.

26. The tube should then be placed into Nursery beds beneath a high flat 
roof of bamboo or similar material. Filtered sunlight is required at this 
stage to maintain growth.

27. The plants should be watered with liquid manure every fortnight.

28. One of the cheapest and most effective manure is made as follows:-
Fill a 200 litres drum \( \frac{1}{3} \)rd with fresh cattle manure. Fill up the drum with water. Allow the mixture to stand with frequent stirrings for 3 months, making good the water lost through evaporation. At the end of 3 months, mix one measure of manure effluent with 2 measures of water and apply to the plants by watering can.

29. When the plants have grown up to 7 mature leaves, they are ready for the field.

30. Thumb Nail Pruning

This is a technique which commences to form a bush in the Nursery, thus making it easier to complete in the field.

31. It comprises, simply, the breaking off of any shoot which exceeds 18–20 cms. in height. At this stage, the shoots are so tender that this can be accomplished by the thumb nail (hence the name). The act of thumb nail pruning is to make the plant throw out new shoots from the base, which eventually will become the branches of the bush.

This is a technique which the writer strongly recommends.

32. Thirty days before the plants are sent to the field all overhead shade should be removed and the plants allowed to "Harden off".
33. **Planting in the Field**

When the plants are ready for the field holes 45 cms. + 30 cms. wide should be cut to receive them. The holes should be half filled with top soil. The Nursery plant is held above the hole, the Polythene tubing is removed by cutting either side with a razor blade, and the plant is carefully lowered into the hole with the minimum disturbance to the roots.

If this is carried out during rainy weather, shade should not be required. If there is hot morning sun, some form of protection such as fern or bracken should be given.

34. Although vegetative propagation is more difficult than stump planting, it should not be beyond the ability of the Outgrower or Small Tea Farmer, whilst the results are a hundred-fold improvement on the older method.
INTRODUCTION

1. The simulated process of fermentation in Tea leaves by the use of chloroform was developed by Dr. D.S. Bendill of Cambridge in 1958 and has been used since then as a selection test for fermentable clones.

   Although, undoubtedly the presence or absence of Enzymes and polyphenols can be detected it is not yet certain whether a clone which obtains the highest marks is a good fermenter only, or a high quality Tea producer as well.

2. Mode of Action

   This is not entirely understood but in some way the chloroform induces a condition in the leaf whereby the ferments (an Enzyme called the polyphenoloxidase) triggers off (catalyses) the Oxidation of the polyphenols (tannins) thereby producing coloured compounds known as thearubigin and theaflavin. Consequently the leaves in the test tubes turn shades of brown like an apple when it is cut. The eventual colours produced vary according to the time they are subjected to the vapour, to temperature and the turgidity of the leaves.

   Rich Brown colours of Grade I are only produced quickly in leaves plucked during dry bright weather.

3. Provisional Directions for Use

   Collect three fully developed first leaves from the flush of each clone, blot off any moisture, place the stalks uppermost in 20x3cm. labelled test tubes containing about 10 drops of chloroform and cork up tightly.

   Allow to stand for 90 to 150 minutes. The time may be gauged by a "Known good Clone" being included in each bottle of 40 - 50 tubes. If the "good clone" takes 120
minutes to turn brown, then 120 minutes must be allowed before matching the other leaf colours on the chart. The "known good clone" is that clone, the Tea from which has received the best report, it should normally change to a bright reddish or yellowish brown colour within 2 hours.

RESULTS

Prepare a colour chart as follows giving each a number 5 to 0.

Record against each test the appropriate number according to the colour of the leaves after exposure to the chloroform.

COLOUR CHART

<table>
<thead>
<tr>
<th>COLOUR</th>
<th>RATING</th>
<th>MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reddish Brown</td>
<td>Excellent</td>
<td>5</td>
</tr>
<tr>
<td>Yellowish Brown</td>
<td>Very good</td>
<td>4</td>
</tr>
<tr>
<td>Light Olive Brown</td>
<td>Good</td>
<td>3</td>
</tr>
<tr>
<td>REJECTION LINE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olive Yellow</td>
<td>Poor</td>
<td>2</td>
</tr>
<tr>
<td>Olive</td>
<td>Bad</td>
<td>1</td>
</tr>
<tr>
<td>Green</td>
<td>Very bad</td>
<td>0</td>
</tr>
<tr>
<td>(colour unchanged)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX IV

### DETAILS OF THE Ph. OF SOIL

SAMPLES TAKEN FROM THE PROVINCES OF KAFFA, ILLUBABOR AND WOLLEGA

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Depth (cm)</th>
<th>Present land use</th>
<th>Altitude (Meter)</th>
<th>Ph. Kcl</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Soyoma - 11kms</td>
<td>0-30</td>
<td>grass plain</td>
<td>1640</td>
<td>6.0</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>N. of Agaro on the way to Bono</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bedele, E. of R. Hedda</td>
<td>0-30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Soyoma - W. of R. Hedda, 10m away</td>
<td>0-30</td>
<td>tall Sorghum</td>
<td>1680</td>
<td>6.2</td>
<td>5.4</td>
</tr>
<tr>
<td>3</td>
<td>10 kms from Agaro on the way to Gera</td>
<td>0-30</td>
<td>grass land</td>
<td>1940</td>
<td>6.5</td>
<td>5.6</td>
</tr>
<tr>
<td>4</td>
<td>12 Kms from Agaro on the way to Gera, near the 0-30 coffee forest</td>
<td>1940</td>
<td>coffee forest</td>
<td>6.3</td>
<td>5.4</td>
<td>16.10.65</td>
</tr>
<tr>
<td></td>
<td>village of Koto</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Bonga - Catholic Mission</td>
<td>0-30</td>
<td>under tea</td>
<td>1860</td>
<td>6.1</td>
<td>5.0</td>
</tr>
<tr>
<td>6</td>
<td>Bonga</td>
<td>0-30</td>
<td>grassland</td>
<td>1850</td>
<td>6.4</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>surrounded by old tea trees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bonga</td>
<td>0-30</td>
<td>coffee field</td>
<td>1840</td>
<td>6.3</td>
<td>5.2</td>
</tr>
<tr>
<td>8</td>
<td>Wush-Wush</td>
<td>0-30</td>
<td>coffee nursery</td>
<td>1880</td>
<td>6.2</td>
<td>5.5</td>
</tr>
<tr>
<td>9</td>
<td>Wush-Wush</td>
<td>0-30</td>
<td>forest</td>
<td>1860</td>
<td>6.2</td>
<td>5.5</td>
</tr>
<tr>
<td>10</td>
<td>Wush-Wush</td>
<td>0-30</td>
<td>coffee plantation</td>
<td>1880</td>
<td>6.0</td>
<td>5.2</td>
</tr>
<tr>
<td>11</td>
<td>Wush-Wush</td>
<td></td>
<td>Catholic Mission</td>
<td>1900</td>
<td>5.9</td>
<td>5.0</td>
</tr>
<tr>
<td>12</td>
<td>Wush-Wush</td>
<td></td>
<td>&quot;</td>
<td>1910</td>
<td>5.8</td>
<td>4.9</td>
</tr>
<tr>
<td>13</td>
<td>Wush-Wush</td>
<td></td>
<td>forest</td>
<td>1920</td>
<td>5.9</td>
<td>5.0</td>
</tr>
<tr>
<td>14</td>
<td>Wush-Wush</td>
<td></td>
<td>tea</td>
<td>2040</td>
<td>5.5</td>
<td>4.6</td>
</tr>
</tbody>
</table>

/cont.
<table>
<thead>
<tr>
<th>Sample</th>
<th>Location</th>
<th>Depth</th>
<th>Present</th>
<th>Altitude</th>
<th>PH.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td></td>
<td>cm.</td>
<td>Land use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Kappa (cont.)</td>
<td>Kappa - 9 kms</td>
<td>on the way to Woshi</td>
<td>0-30</td>
<td>forest</td>
<td>1860</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Near Wosh River</td>
<td>0-30</td>
<td>Bitta forest</td>
<td>1750</td>
<td>6.0</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Kappa - 8 kms</td>
<td>from Woshi</td>
<td>0-30</td>
<td>Castor bean</td>
<td>2000</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>7 kms, on the way to Bonga from Wush-Wush</td>
<td>0-30</td>
<td>coffee</td>
<td>plantation</td>
<td>1640</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>7 kms on the way to Bonga from Wush-Wush</td>
<td>0-30</td>
<td>Wheat land</td>
<td>1630</td>
<td>5.8</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>Gogeb Valley</td>
<td>0-30</td>
<td>sisol &amp; pine</td>
<td>apple plantation</td>
<td>1420</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>Gogeb Valley</td>
<td>0-30</td>
<td></td>
<td>&quot; &quot;</td>
<td>1410</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Gogeb Valley</td>
<td>65 kms from Jimma</td>
<td>0-30</td>
<td>grass land</td>
<td>1350</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>Malco - outside Jimma</td>
<td>0-30</td>
<td>tea bushes</td>
<td>1620</td>
<td>6.0</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>&quot; &quot;</td>
<td>0-30</td>
<td>coffee trees</td>
<td>1620</td>
<td>6.0</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>Mizan Teferi Airport</td>
<td>0-30</td>
<td>grass land</td>
<td>1420</td>
<td>6.1</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>Mizan Teferi</td>
<td>0-30</td>
<td>coffee trees</td>
<td>1420</td>
<td>6.7</td>
</tr>
<tr>
<td>27</td>
<td>ILLUBABOR</td>
<td>Gunevo - 5 miles from Gore</td>
<td>0-30</td>
<td>coffee</td>
<td>1880</td>
<td>6.6</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td>&quot; &quot;</td>
<td>0-30</td>
<td>tea trees</td>
<td>1870</td>
<td>5.8</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>&quot; &quot;</td>
<td>0-30</td>
<td>&quot; &quot;</td>
<td>1860</td>
<td>5.7</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>&quot; &quot;</td>
<td>0-30</td>
<td>&quot; &quot;</td>
<td>1857</td>
<td>5.5</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>&quot; &quot;</td>
<td>0-30</td>
<td>&quot; &quot;</td>
<td>1890</td>
<td>5.4</td>
</tr>
<tr>
<td>Sample No.</td>
<td>Location</td>
<td>Depth (cm)</td>
<td>Present Land Use</td>
<td>Altitude (Meter)</td>
<td>PH</td>
<td>Date</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>------------</td>
<td>-----------------</td>
<td>-----------------</td>
<td>----</td>
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</tr>
<tr>
<td>32</td>
<td>ILLUBADOR</td>
<td>8 kms on the way to Mocha-Gosia forest</td>
<td>0-30</td>
<td>grass land</td>
<td>2000</td>
<td>6.2</td>
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<tr>
<td>33</td>
<td>&quot;</td>
<td>0-30</td>
<td>forest</td>
<td>:1985</td>
<td>5.8</td>
<td>4.8</td>
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<tr>
<td>34</td>
<td>&quot;</td>
<td>0-30</td>
<td>&quot;</td>
<td>:1980</td>
<td>5.6</td>
<td>4.7</td>
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<tr>
<td>35</td>
<td>&quot;Kundi - N.E. of Gore about 4 kms&quot;</td>
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<td>grass land</td>
<td>:1930</td>
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<tr>
<td>36</td>
<td>&quot;Ale Konor - N.W. of Gore&quot;</td>
<td>0-30</td>
<td>maize field</td>
<td>:1766</td>
<td>6.0</td>
<td>5.2</td>
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<td>37</td>
<td>&quot;Ale Konor&quot;</td>
<td>0-30</td>
<td>under tea</td>
<td>:1775</td>
<td>6.1</td>
<td>4.7</td>
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<td>38</td>
<td>&quot;Matu Hospital&quot;</td>
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<td>:1330</td>
<td>5.6</td>
<td>4.8</td>
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<tr>
<td>39</td>
<td>WOLLEGA</td>
<td>17 kms on the way to Gimbi</td>
<td>0-30</td>
<td>grass land</td>
<td>:1800</td>
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<tr>
<td>40</td>
<td>&quot;Gugura - 16 kms&quot;</td>
<td>0-30</td>
<td>Secondary forest</td>
<td>:2120</td>
<td>6.1</td>
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<tr>
<td>41</td>
<td>&quot;Ammuma - 20 kms&quot;</td>
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<td>grass land</td>
<td>:2090</td>
<td>5.9</td>
<td>4.9</td>
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<tr>
<td>42</td>
<td>&quot;</td>
<td>0-30</td>
<td>&quot;</td>
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<td>5.8</td>
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<tr>
<td>43</td>
<td>&quot;</td>
<td>0-30</td>
<td>&quot;</td>
<td>:2060</td>
<td>6.4</td>
<td>5.4</td>
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</table>

Soil Samples taken by Ato Bekela Worku and analysed at The Haile Selassie University
### APPENDIX V

**MONTHLY TOTAL RAINFALL (in mm)**

**SUPPLIED BY THE ETHIOPIAN METEOROLOGICAL SERVICE**

**BONGA MISSION**

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
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<tr>
<td>1960</td>
<td>25.5</td>
<td>82.5</td>
<td>164.5</td>
<td>438.21</td>
<td>219.5</td>
<td>153.5</td>
<td>193.1</td>
<td>237.5</td>
<td>91.0</td>
<td>57.0</td>
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<td>1961</td>
<td>8.0</td>
<td>89.5</td>
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<td>160.0</td>
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<td>1</td>
<td>265.0</td>
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<tr>
<td>1962</td>
<td>34.0</td>
<td>36.0</td>
<td>113.0</td>
<td>228.0</td>
<td>173.5</td>
<td>136.5</td>
<td>197.0</td>
<td>220.0</td>
<td>43.0</td>
<td>95.0</td>
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<td>1963</td>
<td>29.0</td>
<td>131.5</td>
<td>114.0</td>
<td>280.0</td>
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<td>282.0</td>
<td>228.0</td>
<td>179.0</td>
<td>17.0</td>
<td>65.0</td>
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<tr>
<td>1964</td>
<td>46.0</td>
<td>1110.0</td>
<td>177.0</td>
<td>134.0</td>
<td>391.0</td>
<td>245.5</td>
<td>161.0</td>
<td>177.0</td>
<td>1</td>
<td>294.0</td>
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<tr>
<td>1965</td>
<td>24.0</td>
<td>23.0</td>
<td>91.0</td>
<td>226.0</td>
<td>236.0</td>
<td>206.0</td>
<td>207.0</td>
<td>147.0</td>
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</table>

**AGARO**

<table>
<thead>
<tr>
<th>Year</th>
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<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
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<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
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</thead>
<tbody>
<tr>
<td>1961</td>
<td>6.0</td>
<td>15.0</td>
<td>5.4</td>
<td>123.5</td>
<td>251.4</td>
<td>247.0</td>
<td>257.9</td>
<td>202.0</td>
<td>150.5</td>
<td>92.5</td>
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<tr>
<td>1962</td>
<td>4.5</td>
<td>84.5</td>
<td>105.0</td>
<td>151.2</td>
<td>138.1</td>
<td>188.5</td>
<td>132.0</td>
<td>376.0</td>
<td>305.0</td>
<td>140.0</td>
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<tr>
<td>1963</td>
<td>5.8</td>
<td>5.8</td>
<td>60.0</td>
<td>59.5</td>
<td>135.0</td>
<td>188.5</td>
<td>195.0</td>
<td>179.0</td>
<td>54.0</td>
<td>17.0</td>
</tr>
<tr>
<td>1964</td>
<td>28.0</td>
<td>99.5</td>
<td>42.2</td>
<td>145.0</td>
<td>249.5</td>
<td>237.0</td>
<td>1</td>
<td>205.0</td>
<td>36.0</td>
<td>190.0</td>
</tr>
<tr>
<td>1965</td>
<td>21.0</td>
<td>23.0</td>
<td>85.0</td>
<td>127.0</td>
<td>177.7</td>
<td>222.0</td>
<td>97.7</td>
<td>217.5</td>
<td>1</td>
<td>145.1</td>
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</table>

For more months and additional data, please refer to the continuation.
APPENDIX VI

ITINERARY

Met Ato Merque Mekasha, Director-General of Agricultural Research Department,
Dr. F. Haworth, and Dr. Abu Sharr,
Project Manager and Senior Agronomist respectively seconded from F.A.O.

6 October, 1965. Visited the Coffee Board Headquarters
for discussions with Ato Lemma Firchiwot,
Executive Secretary of the National Coffee Board.
Had discussions with Mr. Rowse,
Adviser to the Technical Agency.
Met Mr. H.B. Oliver, Deputy General Manager of the Ethiopian Investment Corporation.

7 October, 1965. Had a discussion with H.E. Ato Akalework Habte Wold, Minister of Agriculture.
Visited Ato Habtew Bairu, Assistant Minister to the Technical Agency.

8 October, 1965. Accompanied by Ato Bekelle Worku, of the Agricultural Research Department
and Ato Mesfin Redi, Agricultural Officer of Sidamo Province, left Addis Ababa for WOLL MO SODO 275 km.

9 October, 1965. Visited WOLL MO SODO, and after a discussion with the Secretary to the Sub-Provincial Governor, visited the SUDAN INTERIOR MISSION STATION.
Afterwards proceeded 40 kms. South of SODO and inspected the National
9 October, 1965. Community Development project and Settlement Scheme.
Inspected likely plots for Tea Nurseries.

10 October, 1965. Visited YUGA LEM and then drove to DILIA and the Bamboo growing area of AGERSELEM. Questioned local Farmers on climatic conditions in that area.

11 October, 1965. Visited the Tomato canning Factory and Abbatoir at Melga Jondo followed by an inspection of the National Community Development Farm at Awasa.

12 October, 1965. Returned to Addis Ababa after a tour extending 1770 kms.

Met delegates of the Council of Middle East Trade and had discussions with Messrs. Thomson (Secretary), Wentworth-Stanley and Green (Members).

14 October, 1965. Accompanied by Ato Bekelle Worku left Addis Ababa for JIMMA.
Met Ato Asrat Mitiku Provincial Director of Agriculture.

15 October, 1965. Inspected the Tea in the premises of the Agricultural office - Met Ato Kassahun Adera, Provincial Coffee Board Supervisor and had a general discussion on the probable income of Small Coffee Farmers.
Visited the School of Agriculture Jimma, and had further discussions with Ato Tesfaye Dimka, Co-operative Expert of the National Community
15 October, 1965

Development. Called on Deputy Assistant Governor Ato Mengesha Mekonnen.

16 October, 1965

Left JIMMA for AGARO accompanied by Ato Alemu Mengistu - Provincial Extension Supervisor and visited the Co-operative Coffee Store. Proceeded North of Agaro for 19 km. on the new AGARO-BUNA BEDELE road.

Returning to Agaro proceeded West along the Agaro-GERERE road for a distance of 12 km. until forced to return because of impassable road conditions.

Questioned many local Farmers on climatic conditions in this area.

17 October, 1965

Sunday - Worked on the Report.

18 October, 1965

Left Jimma for Bonga and called at Ato Tadesse Farm - GOJEB, and inspected the Trial Tea plots.

Reached Bonga at 6 p.m. and spent the night at the SUDAN INTERIOR MISSION STATION.

19 October, 1965

Visited the Catholic Mission in BONGA and inspected the Tea below the Station, as well as an area of Tea some 300 meters to the West.

After lunch proceeded to WUSH WUSH and covered 19 km. in 3 hours.

20 October, 1965

Inspected the prospective locations of Messrs. Brook Bond Ltd. and of Messrs. Bonga Tea Company of Ethiopia-Plantations.
21 October, 1965. Proceeded to the Woshi River taking 3 hours to cover 20 kms. and inspecting as much as possible of the BITTA Forest area. Visited the WOSHI COFFEE Plantation owned by COUNT NILS GUSTAF VON ROSEN. Returned to WUSH WUSH after dark.

22 October, 1965. Had discussions with Ato Mitiku Wako representative of the Ethiopian Investment Corporation who are agents for the Bonga Tea Company of Ethiopia. Afterwards returned to Bonga and made a second inspection of the Tea at the Roman Catholic Mission Station. Called at the WEIZERO ASELEFESH MEKENEN Pineapple and Sisal Farm where the owner agreed to put down trial Tea plots. Paid a second visit to ATO TADESSA'S F.WM and returned to Jimma in the late evening.


25 October, 1965. Visited the School of Agriculture at Jimma for discussions with Ato Yilma Director of Administration who had brought Tea seeds from Kenya. Also met Dr. Alex Warren, Director of Instruction and Research. Afterwards had discussions with Ato Werkalema Hu, local Branch Manager of the Development Bank of Ethiopia on the probable income from Coffee enjoyed by Small Farmers. Visited MALCO Farm where there are 2 Hectares of abandoned Tea and also the Agricultural Departments Nurseries for Coffee and Trees.
26 October, 1965 Left Jimma by air for MILANTIFARRI VIA TEPET. Had discussions with M. Jean Hebbard, Manager of CAPEX Private Limited Company, a coffee Plantation some 25 kms. from the air-strip.

On the return journey from TEPET the Pilot kindly diverted the plane to Wush Wush to enable one to carefully examine, from the air, the proposed Plantation areas.

27 October, 1965 Had further discussions with Ato Tadesse and worked on the report.

28 October, 1965 Left Jimma for Gore by air and was met by Ato Teferra Eshete, Agricultural Officer of ILLUBABOR called on the Provincial Sub-Governor, H.E. Dejazmatch Girmachew Tekle Hawariat.


30 October, 1965 Proceeded by Land Rover to the Plantation of Kenyazmatch Majid Abboud and inspected some 10 hectares of Tea.

31 October, 1965 Proceeded by Land Rover and mule to the GCCHI FOREST, South of Gore and inspected possible Tea lands.

1 November, 1965 Journeyed 6 hours on mule and foot to examine 2 abandoned areas of Tea at ALE KGNOR North West of Gore.

2 November, 1965 Proceeded by Land Rover to MATTU some 23 kms. North East of Gore and had discussions with the Canadian Staff of the Government Hospital.
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 November, 1965</td>
<td>Had second interview with H.E. Dejazmatch Girmachew, Provincial Sub-Governor and left Gore by air for Jimma.</td>
</tr>
<tr>
<td>4 November, 1965</td>
<td>Worked on the report</td>
</tr>
<tr>
<td>5 November, 1965</td>
<td>Left Jimma for Bonàa for discussions with Herr Buckholtz and returned to Jimma in the late evening.</td>
</tr>
<tr>
<td>6 November, 1965</td>
<td>Visited the Government Hospital and Lepersarium being shown round by Dr. Vervoorn.</td>
</tr>
<tr>
<td>7 November, 1965</td>
<td>Left Jimma for Addis Ababa arriving there in the late afternoon after a trip of 1946 kms. by Land Rover plus 2 air trips and journeys by mule and foot.</td>
</tr>
<tr>
<td>8 November, 1965</td>
<td>Had discussions with Dr. Haworth at the Agricultural Research Station on the recent trip.</td>
</tr>
<tr>
<td>9 November, 1965</td>
<td>Had discussion with H.E. Ato Akale York Habte Wold, Minister of Agriculture and H.E. Ato Bellete Gebre Tsadik, Vice-Minister for Agriculture together with Ato Werqu Mekasha, Director-General of Agricultural Research on the progress of the survey to date.</td>
</tr>
<tr>
<td>10 November 1965</td>
<td>Accompanied by Ato Bekelle Yorku left Addis for LEKELIPTI.</td>
</tr>
</tbody>
</table>
11 November, 1965

Called on the Assistant Deputy Governor Fitawrari Yemene G. Egzabheir - then proceeded 40 km. along the Lekempti GEMBI Road.

Afterwards visited the Swedish Evangelical Medical Mission Hospital where the Superintendent agreed to put down a trial plot of Tea.

Accompanied by Ato Tefera, Extension Officer inspected the Amuma Forest area some 30 kms. North of the Highway at Sire.

Consulted numerous local Farmers on the climatic conditions of the Amuma Forest.

Spent the night at Bacco.

12 November, 1965

Inspected the Ethio-German Experimental Station at Bacco, accompanied by Dr. Karl Hermann Peters and his Staff.

13 November, 1965

Returned to Addis Ababa after a journey of 950 kms.

14 November, 1965

Worked on the Report.

15 November, 1965

Had further discussions with H.E. Ato Akale Yerk Habte Wold, Minister of Agriculture together with Ato Yemru Mekasha on the progress of the survey to date.

16 November, 1965

Left Addis Ababa by air for Nairobi.

17 November, 1965

Had discussions with the General Manager of the Kenya Tea Development Corporation - as well as the local Manager of Marshalls Engineering Co.
18 November, 1965 Left Nairobi for Kericho and met General Manager and other officials of Brooke Bond & Co. Ltd.

19 November, 1965 Left Kericho for KANIOEI and inspected seed bearers on APWARREN Estate also inspected the Tea fields grown from this seed on KCISAGAT ESTATE.

20 and 21 November, 1965 NAIROBI

22 November, 1965 Returned to Addis Ababa

29 November, 1965 Discussions with Mr. Wetherell of Mitchell Cotts. Discussions with Mr. Brian Oliver of Ethiopian Investment Corporation.

30 November, 1965 Recorded for Voice of Ethiopia

1 December, 1965 Discussion with H.E. Sir John Russell - British Ambassador.

2 December, 1965 Discussions with H.E. ...to Pellete Gebre Tsadik, Vice-Minister of Agriculture. Recorded for Voice of the People.

3-11 December, 1965 Typing, correcting and publishing Report
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19. Memorandum of the Development of the Tea Industry in Ethiopia James
24. Memorandum on two reports on the Development of Tea Cultivation among the Kenya and Uganda
ACKNOWLEDGMENTS

The writer wishes to acknowledge with grateful thanks the many acts of kindness and assistance received throughout his stay in Ethiopia, particularly from:

Mr. and Mrs. Buist of the British Embassy, Addis Ababa.
Ato Jerque Mekasha, Director of Agricultural Research.
Ato Mesin Redi, Agricultural Officer of Sidamo Province.
Ato Asrat Mitiku, Director of Agricultural Office, Kaffa Province.
Ato Alemu Mengistu, Extension Supervisor, Kaffa Province.
Father Marcus and Father Lucas of the Catholic Mission Station, Bonga.
Rev. and Mrs. Middleton of the Sudan Interior Mission, Jimma.
Mr. John Body of Messrs. Brooke Bond Co. Ltd.
Herr Buckholtz and Ato Dagane of Wush Wush Plantation.
Rev. and Mrs. Rashleigh of the Sudan Interior Mission, Bonga.
Ato Teferra Eshete, Agricultural Officer, Illubabor Province.
Ato Tagne, Land Rover Driver throughout the tour, and last but not least:
Ato Bekele Worku who accompanied the Writer throughout his tours, whose consistent good humour; his ability to get things done, and his many acts of kindness did much to make the Writer's visit to Ethiopia so enjoyable.