1968


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CULTURAL CONTRASTS AND SIMILARITIES AMONG FIVE ETHNIC GROUPS IN THE NILGIRI DISTRICT, MADRAS STATE, INDIA 1800-1963

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in

The Department of Geography and Anthropology

by

William Allister Noble
B.A., University of Georgia, 1955
M.A., University of Georgia, 1957
January, 1968
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ABSTRACT

The Nilgiri District, east of Calicut, India, is dominated by a higher than 6,000-foot massif commonly called the Nilgiris. The northwestern section of the District extends onto the lower Mysore Plateau and the northern section lies in the Mysore Ditch, a broad valley. This study is a survey of how five ethnic groups, the Badagas, Irulas, Kotas, Kurumbas, and Todas, have interacted with neighbors and utilized landscapes within the Nilgiri District. The historical perspective is employed throughout.

The study is based upon an occupance concept in which men are treated as 1) makers of cultural products termed occupance forms, 2) landscape utilizers who alter landscapes to varying degrees, 3) generators of inter-human economic activities, and 4) employees in economies generated by outsiders to their own small cultures. The outstanding characteristics of resultant dynamic cultural complexes, termed occupance patterns, are described. Because dwellings and temples proved to be particularly useful cultural indicators, they were classified according to exterior characteristics and the functional arrangements of their interiors. It also became necessary to employ an agricultural classification system with the three divisions of dry fields, wet fields, and gardens.

Todas living mainly on the northwestern upper Nilgiris are differentiated from the other ethnic groups by their barrel-vaulted,
front-gabled, and conical huts, combined with a religious-economic system based upon buffalo herding.

Badagas on the upper Nilgiris reside in side-gabled houses built into rows, in which there are also temples similar to houses. During the 1800s the Thoraiyas assisted these Badagas in the production of subsistence millets and condiments or opium for sale. Badagas residing in the Nilgiri Wynaad occupy hipped-roof houses and cultivate wet rice with the assistance of Paniyas. Some upper Nilgiri Badagas seasonally herd livestock on western upper Nilgiri grasslands and reside in assorted huts while there. In the Mysore Ditch an economic liaison between upper Nilgiri Badagas and Kasuvas has led to the herding of Badaga livestock by Kasuvas. The Kasuvas occupy distinctive side-gabled dwellings within permanent livestock centers.

There have been similarities between the dwellings and agriculture of the upper Nilgiri Badagas and Kotas since the early 1800s. However, in contrast to Badagas, Kotas have front-gabled temples not built into house-rows. They also vary from Badagas by being basket makers, blacksmiths, carpenters, musicians, and potters. The Nilgiri Wynaad Kotas, who reside in Government-built houses within an expanding urban center, grow wet rice and continue the traditional trades.

Irulas occupying eastern Nilgiri slopes live in side-gabled houses within rows and maintain separate distinctive memorial-temples. In the early 1800s they were partially supported by garden produce and millets, but seasonally depended upon hunting and the gathering of yams.
Kurumbas on southern Nilgiri slopes vary their house plans and do not construct any distinctive temples. Their economy in the early 1800s was very similar to the Irula's economy.

After 1800 the English generated changes through their economic activities, legal actions, and introduction of exotic plants. As the English established and enlarged plantations, more Badagas, Irulas, and Kurumbas went to work on them. Increased job opportunities, not associated with plantations, were mainly taken advantage of by the Badagas. Legal actions between 1874 and 1884 ended Badaga and Kota poppy cultivation, drastically reduced Irula and Kurumba gathering and hunting, and ended shifting agriculture on unowned land. In this century upper Nilgiri Badagas and Kotas abandoned plows and became commercial potato farmers. Introduced plants became the garden plants of all agriculturists.

The post-1947 non-English Madras Government has built houses for Irulas, Kotas, Kurumbas, and Todas, constructed or improved roads, and partially succeeded in rejuvenating Kota trades.
CHAPTER I
INTRODUCTION

Little was known of the people inhabiting the Nilgiri District, southern India, until Francis Buchanan visited the District in 1800. Since that time, five ethnic groups have been mentioned repeatedly in the writings of other visitors to the District. Using the interrelated criteria of occupance patterns, occupance forms, and economies, this study surveys and analyzes the cultural contrasts and similarities exhibited by the five groups. Because significant changes have occurred since 1800, the historical perspective is applied to the three criteria whenever possible. A study in depth, by its very nature, contributes to an understanding of factors causing cultural contrasts and similarities among the five ethnic groups in the early 1800s, and of factors leading to changes since then.

1. The Study Region and Five Ethnic Groups

The study region. The Badagas, Irulas, Kotas, Kurumbas, and Todas, who form the main subjects of this study, live within the Nilgiri District of Madras State. The District lies approximately west-southwest from Madras city, the capital of Madras State, and is less than 50 miles east of Calicut, the southern Indian port reached by Vasco da Gama in 1498 (Figure 1). The Nilgiri massif, with several peaks higher than 8,000 feet, dominates much of the District. However, a part of the District extends over the Wynnaad Plateau to
Figure 1. Index maps
the northwest and into a broad valley called the Mysore Ditch to the north. The eastern slopes of the Nilgiri massif rise above the Central Plain of peninsular India, and the western slopes rise above Malabar plains. The Wynaad Plateau, partially bordered by Western Ghats mountains, lies above the Malabar plains and emerges with the Mysore Plateau to the northeast. The Nilgiri District is bordered by Mysore and Kerala states, and the general region wherein the District lies has long been a contact zone where Kannada-speaking, Malayalam-speaking, and Tamil-speaking southern Indians have met and, on occasion, fought. Despite past wars, nominal control by different rulers, and the fact that the Nilgiri region is near some of the Malabarian ports associated with earliest European contacts, the region had remained relatively isolated until Englishmen started to settle on the Nilgiri massif in the early 1820s.

The English first used the massif as a health resort, but they later established many coffee and tea plantations in the Nilgiri District. The District is now the leading tea growing region and the fifth ranking coffee growing region in southern India (United Planters Association of Southern India 1960: 390). Ootacamund, in the middle of the Nilgiri massif, grew into the central administrative and resort city with over 50,000 people in 1961. The next two cities in size are Coonoor (over 30,000) to the southeast and Kotagiri (over 15,000) to the east of Ootacamund. Both are early resort centers which eventually also served the needs of the coffee and tea industries. Smaller Gudalur (over 8,000), in the northwestern portion of the District, is the administrative center for the Nilgiri Wynaad and caters to local
plantations (Nambiar 1965: 58-60).

The Nilgiri urban centers are connected by a road network (Figure 1). The main ghat (pass) roads converging on Ootacamund run from 1) Mettupalaiyam, in the Coimbatore District, through Coonoor, 2) Mettupalaiyam through Kotagiri, 3) Nilambur in Malabar, Kerala State, through Gudalur, and 4) Mysore, beyond the map in Mysore State, through Gudalur. The northern Sigur ghat road, which is a seldom used short cut running from the Mysore road to the Gudalur-Ootacamund road, is very steep in places. A narrow-gauge railroad, on which central racks and cogs must be used for braking on the steepest gradients, runs from Mettupalaiyam to Coonoor and Ootacamund.

The three main industrial establishments in the Nilgiri District are the Government of India Cordite Factory near Coonoor, the Needle Industries (India) Ltd. farther up the road to Ootacamund, and the Hindustan Photo Films Manufacturing Company near Ootacamund. The first two establishments were founded during the period of English occupation, but construction of the third did not commence until 1962.

An important post-English, i.e., post-1947, development is the Kundah Hydroelectric Scheme, undertaken by the Madras Government and aided by Canadians under the Colombo Plan. In this scheme, probably completed by now, eight dams, several inter-reservoir tunnels, and five powerhouses were to be constructed mainly within the drainage basins of the Upper Bhavani and Kundah rivers in the southwestern Nilgiris. The Pykara Hydroelectric Scheme, begun by the English in 1929, was enlarged and completed recently. Three dammed reservoirs in the Pykara and Sandy Nala valleys west of Ootacamund, penstocks
dropping 3,080 feet in altitude to a powerhouse in the Mysore Ditch, together with a dammed reservoir and powerhouse in the Moyar River valley, are the main features of the last-mentioned scheme (Nambiar 1965: 26-27).

The five ethnic groups. In 1871, when the first controlled census was taken, the Badagas, Irulas, Kotas, Kurumbas, and Todas formed about two-fifths of the population in the Nilgiri District (Hunter 1886, 10: 308). By 1961, however, the immigration of other people had lowered this fraction to about one-sixth (Nambiar 1965: 8, 10, 254). In the 1871-1961 period the following population changes took place among the five ethnic groups (Grigg et al. 1880: 30; Nambiar 1965: 8, 254):

Badagas: from over 15,000 to over 60,000 (estimated)
Irulas: from 1,470 to 4,502
Kotas: from 1,112 to 832
Kurumbas: from 613 to 1,174
Todas: from 693 to 706

The decrease in the number of Kotas is partially attributable to a smallpox epidemic.

The racially Caucasoid Badagas speak Badagu, worship Lord Shiva, and form an agricultural Hindu caste; most of them dwell above 6,000 feet on the Nilgiri massif, but there are some who inhabit the Wynad Plateau (Figure 2). Caucasian-Australoid Irulas of the Nilgiri District speak a Tamil dialect, are devotees of Ranga, and form a partly Hinduized agricultural caste; they inhabit eastern Nilgiri slopes. The Irulas of Coimbatore District and Kerala State, who apparently are descended from the same ancestral stock as the Nilgiri District
Figure 2.
Irulas, are not covered in this study. Australic-Caucasoid Kotas speak a Kannada-Tamil language called Kota, worship their own female and male deities (Amnor and Aynor), and are treated as lowly non-caste people by their neighbors. The low ranking of the agricultural Kotas is due largely to their artisan activities, performance of services, and the fact that Kotas once formed the only Nilgiri ethnic group whose members ate beef and carrion. Kotas occupy six hamlets on the Nilgiri massif and another hamlet in the Nilgiri Wynaad (Figure 2). Caucasian-Australoid Kurumbas (Plate VIII, A) speak a Tamil dialect, worship the male Herugudian and female Mesanie, and are socially ranked low because they are artisans, musicians, and doctor-sorcerers. Most Kurumbas occupy southern Nilgiri slopes. Australoid-Caucasoid Todas (Plate I, A) speak a Kannada-Tamil language called Toda, worship their own female and male deities (male On and female Teikirzi are the most important), and rank high in caste because they are vegetarians, whereas the members of all other ethnic groups eat mutton (Rivers 1906: 182-183). Todas mainly occupy western upper Nilgiri temperate grasslands in the Mallanaud, but some of them inhabit temperate grasslands elsewhere (Figures 1 and 2).

There are similarities and variations in the economies of the ethnic groups. In the following outline of economic activities, ethnic groups with similar economies are discussed together. The sequence thus runs from the Todas to Irulas and Kurumbas, to Badagas and Kotas on the upper Nilgiris, to Badagas and Kotas in the Nilgiri Wynaad.

Todas herd only buffaloes and live in scattered hamlets where milk from secular buffaloes is processed in huts. The milk from their
sacred buffaloes is processed in several grades of dairy-temple centers located within hamlets and dairy-temple centers some distance away. Clarified butter (ghee), the end product of milk processing, is sold to earn income for families and dairy-temple priests. Nowadays, a few Todas are turning to agriculture.

While Irulas inhabit hamlets, Kurumbas occupy hamlets, semi-nucleated communities, and dispersed houses. In the past both groups depended upon garden produce and shifting slash-burn agriculture alternated with gathering, hunting, and trapping activities. Besides providing music and selling or bartering gathered products and artifacts, the Kurumbas have also obtained income from their neighbors by acting as doctors, sorcerers, and performers of agricultural ritual to ensure abundant harvests from Badaga crops. Irulas obtain additional income by supplying gathered products and artifacts to neighbors. Certain Irula families obtain fees for rituals performed by male members who are priests.

Badagas and Kotas living in hamlets or villages on the upper Nilgiris maintain kitchen gardens near their homes. They once used plows in shifting slash-burn agriculture. In this century they stopped using plows and turned increasingly from cultivation of millets to commercial potato production. After Badagas and Kotas were forced to use only assigned lands and shifting slash-burn agriculture became an impossibility, they cultivated plots alternately on their own holdings. However, the tendency now is toward intensive, sustained land utilization aided by applications of chemical fertilizers and insecticides. Kotas have varied from Badagas in being professional
basket makers, blacksmiths, carpenters, hide curers, potters, and musicians. Badagas worked as laborers when Englishmen started living on the Nilgiris, but have increasingly obtained clerical and professional employment. Badagas and Kotas use seasonal livestock centers to graze herds of buffaloes and cattle on the temperate grasslands. The Badagas have established a sacred buffalo herd and dairy-temple at Bergani (Figure 1). Through the cooperation of employed Kasuvas, they also manage to keep buffaloes and cattle in the Mysore Ditch (Figure 2).

Excluding some Badagas dwelling in dispersed houses, Badagas and Kotas in the Nilgiri Wynaad occupy hamlets. Both depend upon rice grown in wet fields. There are assorted gardens near their houses, and the Badagas grow millets on upland dry fields. As on the upper Nilgiris, Kotas are differentiated from the Badagas by their trades. Some Badagas labor on nearby plantations.

2. The Philosphic Base

The premise. The interpretive approach employed in following chapters is based on the premise that members of a small culture who occupy a similar environment will repeatedly adjust and utilize the landscape in a set pattern, or in set patterns, conforming to their needs and technological capacities. Because the members are conformists, they build similar occupancy forms, arrange the forms in the same fashion, and use the landscape about their dwellings according to the economy related to their culture. Adjustments to environments by members of many small cultures, therefore, result in typically
associated occu­pance patterns, occu­pance forms, and economic activi­ties. These three criteria are focused upon in this study.

**Definitions of terms.** To avoid misunderstanding, it is important to understand clearly frequently used and essential terms. These are now defined:

*An occu­pance pattern* is a dynamic cultural complex which may be noticeably impressed on the landscape by a patterned combination of man-made occu­pance forms and landscape changes resulting mainly from economic activities. Upon occasion, however, a landscape remains so unaltered by economic activities, that knowledge of these activities must be gained before an associated occu­pance pattern may be outlined. But regardless of landscape changes, or lack of them, any occu­pance pattern is better envisioned through the apprehension of its related occu­pance forms and economy.

*An occu­pance site* inhabited by men is the nucleus of an occu­pance pattern. As such, it matters whether the site is occupied for several days, several months, several years, or permanently. Men occupying a site build occu­pance forms and are exploitive agents using the adjacent landscape. Because of this, an occu­pance site may generally be considered as the starting place for interpretation of an occu­pance pattern.

*Associated centers* are uninhabited, ritualistically important centers which may be near to, or far from, occu­pance sites. Each center usually contains at least one occu­pance form. Centers are classified as burial, cremation, memorial, or worship centers, or as...
centers with combinations of these functions.

All occupance forms, as man-made structures, are clearly cultural products. Examples of occupance forms are houses, temples, calf-huts, buffalo-pens, and constructed paths. A path resulting from men walking repeatedly between two points is not considered an occupance form, but merely an alteration of the landscape. Fields, which are not occupance forms, are ideal examples of areas altered by economic activities. If fields are terraced, however, their constructed banks must be classified as occupance forms. One might argue that any terrace level, which may even be formed of earth carried long distances by men, is also an occupance form. In response to this argument I would reply that the earth on the terrace level remains nature's earth, despite being altered by man's activities. If terraced fields were left untouched by man for a thousand years, remnant banks would still be classified as man-made features. But terrace levels covered with wild vegetation and rejuvenated soils would provide proof that man, after constructing banks, provided levels upon which natural processes could dominate.

Occupance types are occupance forms which are culturally diagnostic. When, for example, a house's architectural style and interior functional arrangement of features are copied repeatedly, the house is classified as an occupance type. It may more simply be called a house type.

Economic activities generated by the members of a small culture who inhabit an occupance site and alter the landscape may be classified as 1) those which alter the surrounding landscape to the greatest
degree, 2) others which alter the landscape to either a lesser or a negligible degree, and 3) trades and services yielding income from other members and outsiders. The inhabitants of the occupancy site may also find employment in economies generated by outsiders who are not members of their own small culture.

While occupancy forms are best described in terms of their structure and the functional relationships of their parts, the relationships of economies to altered or unaltered landscapes, or to human interactions, are best described in terms of economic activities. These two descriptive approaches are utilized in this study.

Six descriptive steps. Because members of the five Nilgiri ethnic groups are constantly affected by natural phenomena, the next chapter, Chapter II, is devoted to a discussion of these phenomena. The remainder of the study covers cultural phenomena. Excepting some Kurumbas who apparently moved periodically in the past, and a few Badagas, Kotas, and Todas who still practice transhumance, members of the five groups are permanently settled. Economies associated with the groups have led to varying landscape changes. Therefore, description of cultural phenomena pertains mainly to settled men who have changed landscapes.

These six steps aid description of the cultural phenomena related to each Nilgiri ethnic group forming a small culture undergoing change: In step one the general characteristics of the occupancy pattern, or patterns, associated with a particular group are outlined. Step two involves the description of occupancy types
located on an occupancy site, or sites, and in associated burial, cremation, memorial, or worship centers. In step three the economic activities altering the surrounding landscape to the greatest degree are described. In step four the economic activities altering the landscape to either a lesser or a negligible degree are considered. Step five pertains to trades and services generated by members of the group under consideration and yielding income from other members and outsiders. In step six discourse turns to the employment of group members in economies generated by outsiders.

The historical viewpoint. A few ancestors of members in each ethnic group brought occupancy concepts to the Nilgiri District. These concepts were applied to Nilgiri environments and altered in varying degrees. The ancestors and their descendents developed different approaches to landscape utilization. The borrowing of cultural traits and inventiveness were involved in this process. After the five ethnic groups were established in the Nilgiri District, interactions between their members led to economic relationships. The same interactions also led to the borrowing of cultural traits. Through time, similar characteristics between groups were thus developed. By comparing the interrelated occupancy patterns, occupancy forms, and economies presently associated with the five ethnic groups the present may, to a limited degree, be used as a key to the understanding of pre-1800 processes resulting in cultural similarities and variations.

The historical record becomes clearer after 1800 when the
presence of European and Indian outsiders led to significant changes. This study attempts, through a running commentary, to record changes occurring since 1800. Reference is made to cultural traits which are new, or which are atypical in the sense that their association with one or more Nilgiri ethnic groups have not gained wide acceptance. If enough time has passed and introduced cultural traits are universally accepted, available historic data pertaining to their introduction and acceptance are considered. In an effort to reconstruct abandoned occupancy forms and past economic activities, some of which belong to the pre-1800 period and are theoretical, art motifs, a folk story, old photographs, and rituals have been used.
NOTES

1 The word Badaga, which means Northerner, is generally applied to six castes forming a Saivite caste complex which is associated with past migrations of people from Mysore. The Adiakari, Badaga, Harvar, Kannikar, Lingayat, and Thoraiya caste members speak Badagu and are so classified in each census. It is thus impossible to know the exact number of people in each caste. As only the members of the largest caste, the Badaga caste, are referred to in this study, their numbers must be estimated.

2 Following the classificatory system established by Garn, the writer considers each Nilgiri ethnic group as a micro-race (Garn 1961: 13, 122, 129). The micro-races persist because of 1) immigration of a group's ancestors within a period apart from each period in which ancestors of another group arrived and 2) persisting cultural barriers. However, due to limited gene-crossing, it must be remembered that each group has members who racially blend with members of the other groups. Using Coon's recent classification of world races, an attempt is made to broadly classify members of the five ethnic groups by arranging them in a spectrum ranging from the Caucasoid Badagas to the Caucasian-Australoid Kurumbas (Coon 1965: 194-196, 198-201).

3 Languages are labeled according to Emeneau's classification of South Dravidian languages (Emeneau 1964: 1-13).
CHAPTER II

THE PHYSICAL BASE

The Nilgiris, which are geologically related to adjoining regions, form the largest and generally highest southern Indian massif. Resultant orographic influences lead to considerable variation in climate, soils, and vegetation from Malabar plains to the Central Plain. Because the Nilgiris thus form but a part of a physical continuum, their relationships to adjacent regions are outlined in this chapter under the headings of geology and physiography, climate, soils, and vegetation.

1. Geology and Physiography

Excepting recent sedimentaries along coastal Malabar, the Nilgiris and adjacent regions are dominated by Precambrian Archaean rocks ranging in age from earliest Dharwars to later granites (Hayden and Hatch 1904: 10-18, Plate IV; Krishnan 1954: 175-177; Krishnan 1958a: 61; Krishnan 1958b: 72; Muthuswami 1930: 86-87; Iyer 1929: 121-123, 133-134; Pascoe 1950, 1:35-36; Thiagarajan 1962: 306-307). The Nilgiri massif and other massifs in extreme southern and eastern peninsular India are largely composed of Charnockitic intrusions (Figure 3). Rocks of the Charnockite Suite are associated with charnockite, a peculiar hypersthene quartz felspar rock. In the Nilgiri and other regions steeply dipping charnockite and related
Figure 3.
gneisses or schists conform to large-scale rock foliation varying in
direction from northeast to east-west to northwest. An older Dhar-
warian orogeny with a general northwesterly trend and especially a
later Eastern Ghat (mountain range) orogeny with a general northeast-
erly to east-west trend, dating to the Precambrian period, are
believed to be largely responsible for the widespread rock foliation
(Aswathanarayana 1956: map opposite 24; Aswathanarayana and Mahadevan
1955: 73-74). The Nilgiri massif and other massifs farther south are
located in a zone affected by both orogenies. The highest peaks in
southern India, including over 20 peaks in the Nilgiris with eleva-
tions over 8,000 feet, rise in the same zone. It is conjectured that
as erosion continued in this zone, and tremendous masses of overburden
were removed, Charnockitic blocks became horsts rising between fault
lines created by past vertical plus horizontal pressures (Fermor 1936:
48-51). Presence of the highest peaks parallel to and near the
Malabar coast is perhaps the result of isostatic rise in response to
down faulting of several 1,000 feet off the Malabar coast during the
Miocene (Krishnan 1953: 87, 89; Krishnan 1960: 78). The same process
may also be responsible for the tilting of the Deccan and Mysore
plateaus toward the east.

The Nilgiri massif appears to be a jointed triangular block
tilted toward the east (Figures 1 and 3). Outer slopes are generally
steep, and some western slopes form spectacular escarpments falling
away from peaks rising above 8,000 feet to a Malabar plain which is
less than 500 feet high. Rivers, such as the Coonoor, Kundah, Pykara,
and Upper Bhavani, have cut gorges into the outer slopes. One of
these gorges, forming the Coonoor Pass, was used as the route for the only railroad and a main road leading to the upper Nilgiris. Above 6,000 feet terrain tends to be more gently sloped, but cannot be said to form a plateau. Above 7,000 feet there are rolling, hilly uplands interspersed with prominent peaks or ranges. Dodabetta (8,640 feet) in the central Nilgiris is the highest peak, but the majority of peaks over 8,000 feet in elevation (including Mukerti, 8,380 feet) are located in the western Kundah ranges. The summit hills and mountains are characteristically eroded into rounded features.

Water from most Nilgiri streams and rivers drains into the eastward flowing Bhavani and Moyar rivers, located to the south and north of the Nilgiri massif. Because the two rivers have such straight courses, they may perhaps be flowing along fault lines from which the southern and northern Nilgiri slopes have been eroded back. A portion of the Moyar River flows through a gorge, and the Moyar is also associated with a broader valley eroded into the Mysore Plateau. The broader valley now separating the Nilgiri massif from the Mysore Plateau to the north is called the Mysore Ditch.

The Wynaad Plateau, which spreads northwestward from the high Nilgiris, is an extension of the intermontane Mysore Plateau. Outer slopes of the Wynaad Plateau are steep, and Charnockitic mountains (Camel's Hump, for example) rising to elevations above 7,000 feet form Western Ghats ranges running along the Plateau's edge. With the exception of scattered peaks and ranges, rolling hills less than 500 feet high cover much of the Plateau. Its surface lies below 4,000 feet and decreases in elevation toward the north and east. Lower
elevations are associated with slope of land to the eastward flowing Kabbani River, a tributary of the Cauvery. In portions of the Wynaad Plateau where drainage is poor, many swamps were formed in the valleys between hills. The Mysore Plateau, bordering the Mysore Ditch, extends eastward to the Biligiri Rangan Hills and other Eastern Ghats ranges (Figures 1 and 3).

Because the discontinuous Eastern Ghats Charnockitic mountains are lower than those of the Western Ghats, and the Central Plain next to the mountains lies at an elevation of over 1,000 feet, the eastern edge of the Mysore Plateau in some places drops off gradually to the Central Plain. This plain, sloping gently eastward from the Nilgiri massif, has a flat surface occasionally interrupted by granitic hills. The Bhavani and Noyil rivers flowing across the Central Plain eventually join the eastward flowing Cauvery. From the southwestern Nilgiris, mountain ranges rising no higher than 6,550 feet run southward to the Palghat Gap, which is the most prominent gap in the mountains of peninsular India. Very flat to hilly plains in Malabar, west of the Nilgiri massif and Western Ghats ranges, generally lie below 500 feet. However, between the westward flowing Beypore and Ponnani rivers there is a higher hilly plain interrupted by several Charnockitic peaks rising above 1,500 feet.

2. Climate

The Nilgiri and adjacent regions are influenced by four general seasons--1) the drier season extending from December through March; 2) the hot season with mango showers in April and May; 3) the wet
westerly monsoon season in June, July, and August; and 4) the wet easterly monsoon season in September, October, and November. Easterly winds predominate over most areas during the drier season, and there is a distinct rainfall deficiency everywhere. Lowest annual temperatures are recorded in the first two months of this season, but general warm-up takes place by the end of it. April and May are the hottest and most depressive months for humans. Atmospheric convective activity, growing in March, increases during April-May, and in mountainous areas winds are forced aloft. Storms resulting from convective activity plus orographic influences produce showers called "mango showers," and in April-May thunderstorm frequency reaches a peak for the year. By June winds have shifted, and then continue to blow from a predominantly westerly direction through August. While westerly winds blow, heavy monsoonal rains usually fall on Malabar plus Western Ghats slopes and crests. Although some easterly areas receive very little precipitation, all are subject to some rainfall during this season. Due to extensive cloud cover and rains, temperatures are everywhere somewhat lower during the westerly monsoon. In September easterly winds predominate again and bring easterly monsoon rain until December. October is usually the rainiest month in this season. The Central Plain and easterly slopes receive their heaviest rainfall during the easterly monsoon season, but more westerly mountainous areas and Calicut on the Malabar coast may in this season receive more rainfall than places on the Central Plain.

A west-east rainfall spectrum (Figure 4) shows that 1) mountainous areas receive more rainfall than adjacent plains, 2) areas
Figure 4.
west of the western Nilgiri Kundah ranges receive more annual rainfall than areas to the east, and 3) westerly monsoons dominate in western areas, while easterly monsoons dominate over the Central Plain and eastern Nilgiri slopes. In places tending toward aridity, such as Satyamangalam on the Central Plain, mango showers are a vital source of moisture. Taking yearly rainfall into consideration, Calicut on the Malabar Coast receives over 100 inches, whereas Satyamangalam on the Central Plain receives about 25 inches (for locations refer back to Figures 1 and 3). Vayatri, on the edge of the Wynaad Plateau and at the head of a valley up which westerly monsoon winds are funneled, receives over 200 inches. In contrast, Kotagiri, at higher elevation and in one of the rainiest areas on eastern Nilgiri slopes, receives less than 70 inches. Gudalur, below the Nilgiri massif and on the edge of the Wynaad Plateau, receives about 90 inches. Nedivattam, on the edge of the Nilgiri massif above Gudalur, receives about 100 inches. In contrast, Kodanad on the eastern edge of the Nilgiri massif, receives less than 60 inches. Ootacamund, with a central location at over 7,000 feet, receives less than 60 inches, but benefits from both monsoons.

Monsoon regions characteristically show fluctuations in rainfall received from one year to the next. In a period ranging from 1881 to 1940 at Calicut and Coimbatore, and 1901 to 1940 at Ootacamund, there were years during which no rain fell in December, January, February, and March (Figure 4). Calicut had in some years received no rain during April and November. Coimbatore had sometimes received no rain during April, August, September, and October. The mean July
rainfall at Calicut was 32.46 inches, but in 1918 only 7.09 inches fell during this month, whereas in 1937 rainfall for the month amounted to 59.21 inches. At Coimbatore mean October rainfall was 6.31 inches, but rainfall during this month varied from zero in several years to 16.25 inches in 1930. At Ootacamund mean July rainfall was 8.36 inches but this month's rainfall fluctuated from 1.94 inches in 1917 to 25.08 inches in 1903. Mean October rainfall at Ootacamund was 7.98 inches, but rainfall during that month varied from 1.97 inches in 1938 to 13.46 inches in 1939.

As one ascends the mountains temperatures naturally become lower. Although snow has never been recorded on the Nilgiris, frost occurs quite frequently during the dry season. At Nanjanad, in a period extending from 1930 to 1954, there was an average of four frost-days in November, nine frost-days in February, and three frost-days in March (Balasubramanian and Bakthavathsala 1956: 404). It is no wonder that English colonials once made the Nilgiris a resort area and governmental center during the hot season, for the climate on the massif's summit (Koeppen-Cwbig) is similar in many ways to that of England. According to Koeppen, Malabar has a monsoon climate (Amig) and the Central Plain has a tropical steppe climate (BSh). There are thus noticeable climatic differences between the Malabar coast and Central Plain.

3. Soils

Remnant hills in Malabar are frequently covered by laterites resulting from intensive weathering and soil formation extending over
a long time period. In advanced soil profiles rarely thicker than 25 feet there will be pisolitic laterite near the surface and vermicular laterite farther below. Pisolitic laterite contains iron concretions sometimes coalesced into slag-like material, whereas vermicular laterite has many irregularly shaped tubes usually filled to varying degrees with kaolinitic clays. The most advanced profiles are found on well-drained, highly weathered, flat to low gradient land ranging from 50 to 600 feet in elevation. On steeper slopes where erosion has prevented more deeply weathered profiles from forming, or on flatter areas (including valley terraces) where insufficient weathering through time has impeded the development of deeper profiles, soils may contain only pisolitic laterite. Elsewhere, covering varying gradients and terrain positions, there are soils with different thicknesses of massive kaolinitic clays. These may be called lateritic clay, lithomargic, or red, brown, and yellow soils. A layer of pisolitic laterite will sometimes form near the surfaces overlying these soils (Fox 1936: 399-400; Lake 1891: 224-225, 228-229; Mohr and Van Baren 1954: 154; Raychaudhuri 1941: 232; Satyanarayana and Thomas 1961: 108-117).

The laterization process leading to formation of the above-mentioned soils is associated with concentration of aluminum plus iron oxides through upper profile disilication and leaching out of remaining bases. Red, brown, and yellow soils are formed first, pisolitic laterite is developed later, and vermicular laterite represents the climax stage. Good drainage is essential in the laterization process, and high temperatures, which accelerate chemical reactions, plus
enough rainfall to ensure leaching naturally help. Evaporation combined with upward capillary movement of water evidently play a vital role in pisolitic laterite formation. Downward and upward water flushing appears essential to vermicular laterite formation in Malabar. This flushing is brought about mainly by fluctuations in groundwater from season to season. Once vermicular laterite has formed, it in turn will aid in drainage and water storage. Rainwater on sections underlain by vermicular laterite drains below the surface rapidly. Because this type of laterite contributes to water retention, rivers and streams continue to flow throughout the dry season (Lake 1891: 237; Logan 1887, 2:33).

Although higher elevations temper climate, tropical influences remain strong in mountain and plateau regions. Weathered rock in even the highest parts of the Nilgiris often forms a 40 to 50 foot mantle, and borings at the Sandy Nala dam (close to 7,000 feet) indicated a mantle thickness of 130 feet (Krishnan 1958b: 177). There are also many exposures of parent rock, especially on ridge tops. Due to downward erosion of sediments, landslides, and soil-creep, weathered debris plus soils accumulate toward valley bottoms. Thus, soils tend to be thicker on or near valley bottoms and thinner upslope. Laterization is responsible for the prevalent red, brown, and yellow soils of greatly varying thicknesses. There are also scatterings of pisolitic laterite (Benza 1835: 417-419; Blanford 1859: 221, 235-237; Grigg et al. 1880: 464). Although there may be some localized occurrences, no clear-cut evidence exists for the presence of vermicular laterite on the Nilgiris.
Some of the upland soils are the result of processes other than laterization. In depressions where water tends to accumulate and oxidation is resultantly slower, dark brown to black soils will form. Such soils are found in Nilgiri bogs and Wynaad swampy depressions. Nilgiri black bog soil, which crumbles to powder or breaks into prismatic masses when dry, obviously has a high organic content (Benza 1835: 417). In 1857 peat from Nilgiri bogs was being used by the English for fuel (Cleghorn 1861: 178-179). Some grassland soils have certainly been formed in part by biotic influences. Annual fires combined with repeated cropping by domesticated buffaloes produced soil aridity and reduced humidity in air layers adjacent to the ground. Because grass has long grown on these soils, there is often a dark brown to blackish layer next to the surface. In forests at higher elevations there are accumulations of decomposing organic material on the ground, and soils immediately below appear to be darkened by humus carried down. Whether or not podsolization is operative to some degree at higher elevations is an unsettled question, but it seems likely that in forested areas this process is partially active.

The steppe climate of the Central Plain inhibits weathering and soil laterization. As a result, soils are shallow and vary from black to red in color. Within the climatic limits, drainage is the main determiner of whether a soil will be black, red, or some shade between. Red soils occur on higher sloped ground, and exist because there has been effective drainage leading to leaching and oxidation in their profiles. Laterization has taken place in these soils, but
not to the degree that it has in more humid areas to the west. Red soils grade to brown and then black soils, which are commonly called black cotton soils. Black soils, often varying from three to five feet in thickness and covering low-lying terrain, offer every evidence of ineffectual laterization. They are comparatively rich in silica and deficient in aluminum-iron content throughout their profiles, are base-saturated (mainly calcium), and usually have a granular to crumb structure. At lower levels in the profiles calcium concretions, called kankar in India, will often accumulate. The typical clays of the black cotton soils are montmorillonitic, so soil cracks tend to form in the dry season. Although these soils have a low humus content and are calcareous near the surface, they are in other ways similar to Russian chernozems. They might, therefore, be called tropical chernozems (Basu and Sirur 1939: 640-645, 690-696; Mohr and Van Baren 1954: 179-180, 422-426; Mukerji and Agarwal 1943: 587-588, 596-597; Raychaudhuri, Sulaiman, and Bhuiyan 1943: 264-272; Viswanath and Ukil 1944: 344, 361-362).

4. Vegetation

Moist deciduous forests, found only in remnant patches on Malabar plains, cover western Nilgiri and Wynaad slopes up to an elevation of approximately 2,500 feet (Figure 5). Broadleaved trees growing to heights of over 100 feet may form a continuous canopy. Because most trees estivate in the dry season, the forests then assume a parched brown appearance. Axlewood (Anogeissus latifolia Wall.), matti (Terminalia tomentosa Bedd.), poomaraday (Terminalia paniculata Roth.),
VEGETATION of the NILGIRI REGION

Based on the Cape Comorin Sheet, International Vegetation Map, 1961 - Indian Agricultural Research Council and French Institute at Pondicherry.

Figure 5.
teak (*Tectona grandis* L.), and venteak (*Lagerstroemia lanceolata* Wall.) are dominant and valuable timber trees. As these species are to varying degrees resistant to fire, their preponderance is partly due to the common practice of periodically firing the forest floors. Large gregarious poomaraday stands cover tracts where biotic disturbances have been intense.

Western tropical moist evergreen forests, also called ghat rain forests, are best developed in sections where over 100 inches of annual rain fall on western slopes between 1,500 and 4,000 feet. Trees compete for space, and the upward struggle for light causes tree crowns to stand at different heights from the ground. When the overhead canopy is a tangled mass of tightly fitting crowns, very little light reaches the forest floor, and dark cool spaces then exist near the surface. A few trees growing higher than 130 feet emerge above the canopy. Frequently occurring and characteristic trees are *Bischoffia javanica* Bl., *Canarium strictum* Roxb., *Cullenia excelsa* Wt., *Diptercarpus indicus*, *Elaeocarpus tuberculatus* Roxb. (conspicuously buttressed), *Mesua ferrea* L., *Palaquium ellipticum* Engl., *Poeciloneuron indicum* Bedd., *Syzygium* spp., and *Vateria indica* L. On lower slopes, *Hopea parviflora* Bedd. is sometimes common. *Arengo wightii* Griff., *Caryota urens* L., *Pinanga dicksonii* Griff. are upright scattered palms, but several species of climbing palms (*Calamus* spp.) are also present. Among the giant creepers climbing to the highest tree crowns are the snuffbox sea bean, *Lens phaseoloides* Stock., and a gymnosperm, *Gnetum scandens* Roxb. Short. Reed bamboos—*Ochlandra* spp., *Oxytenanthera* sp., and *Teinostachyum* sp.—grow close to the
ground. Higher up, a large number of aroids, ferns, and mosses lead an epiphytic existence on tree trunks or branches.

Moist deciduous forest on the Wynaad are in leeward areas which receive 50 to 90 inches of rain per year. Scattered remnants of similar forests occur on eastern Nilgiri slopes with over 50 inches of annual rain. These forests contain trees growing higher than 100 feet and forming a continuous canopy. Matti and teak tend to be the dominant species. However, in higher rainfall areas, matti and myrabolan (Terminalia chebula Retz.) trees outnumber teak. Axlewood and venteak are also common.

Dry deciduous forests on the Wynaad occur in interior sections where annual rainfall is between 30 and 50 inches. Eastern Nilgiri slopes with less than 50 inches annual rainfall are associated with remnants of dry deciduous forests. Trees do not grow as high as those in moister areas and generally form a broken canopy. Axlewood is the dominant species, but teak is also abundant. Scattered matti, myrabolan, rosewood (Dalbergia latifolia Roxb.), vengai (Pterocarpus marsupium Roxb.), Albizzia chinensis Merr., Garuga pinnata Roxb., and Vitex altissima L. trees grow alongside the two main species.

On dry northern Nilgiri slopes and in the Mysore Ditch, where annual rainfall is probably less than 30 inches, there are more open deciduous savanna woodlands with some pure red sanders (Pterocarpus santalinus L.) tree stands. Rocky terrain may be partially responsible for the concentrations of this species. Besides the red sanders trees, there are scattered acha (Hardwickia binata Roxb.), axlewood, sandalwood (Santalum album L.), and teak trees. Occasional
occurrence of *Acacia leucophloea* Willd. and *A. chundra* D. C. reflect the semiarid conditions.

Xerophytic close thorny thickets occur in portions of the Mysore Ditch sloping to the Central Plain and on lower eastern slopes. Where biotic influences have been intense on lower southeastern Nilgiri slopes and on portions of the Central Plain, there are now discontinuous thorny thickets. The thorny thickets occur where annual precipitation is less than 35 inches. *Acacia chundra* Willd., *A. leucophloea* Willd., and *A. planifrons* W. & A. are the dominants among trees which may form a single low canopy from 20 to 30 feet above ground. *Albizzia amara* Boiv., *Chloroxylon swietenia* DC., *Euphorbia* spp., *Manilkara* spp., and stunted trees of the same species found in deciduous forests grow among the acacias.

Subtropical moist evergreen forests, which rise above western tropical moist evergreen forests and are also transitional to temperate forests (sholas) in other parts of the Nilgiris, extend up to approximately 6,000 feet. Although plants from lower and higher elevations grow in subtropical moist evergreen forests, the substantial number of evergreen species confined almost entirely to these forests makes them distinct. Most trees are below 60 feet in height and generally form a closed canopy. Mixing of many tree species is characteristic, but *Elaeocarpus* spp., *Hydnocarpus alpina* Wt., *Syzygium jumbolanum* DC., and *Schefflera* spp. may be dominants. Other trees frequently occurring are *Celtis wightii* Pl., *Litsaea stocksii* Hk., *Meliosma arnottiana* Wt., *Michelia champaca* L., and *Symplocos spicata* Roxb.
Savanna grasslands resulting from biotic disturbance in forested areas occur alongside all the tropical and subtropical associations hitherto mentioned. On the savannas there are a few to a large number of scattered tree species found also in nearby forests. According to the intensity of biotic disturbance, grasses present will vary in height from less than 6 inches to 8 feet. In areas that are the least disturbed biotically, *Chrysopogon fulvus* Choiv. and *Sehima nervosum* Stapf dominate on sloped terrain, but on flatter terrain *Dichanthium* spp. are dominants. As biotic disturbances increase, *Cymbopogon* spp., *Heteropogon* spp., *Pseudanthistiria* spp., and *Themeda* spp. will eventually dominate. Where biotic disturbances are intense and eroded surfaces appear, annual *Aristida* spp., *Digitaria* spp., *Eragrostis* spp., and *Panicum* spp. will become dominants. *Iseilema* spp. are associated with moist soils. *Imperata cylindrica* Beauv. and *Saccharum* spp. grow gregariously on surfaces subject to waterlogging. However, during the monsoons *Imperata* and *Saccharum* spp. may form extensive colonies on burned lands. Typical grasses covering temperate grasslands, described later, also grow on higher subtropical savannas.

Some savanna tracts, labelled shrub savannas, have been intensively colonized by shrubby bracken (*Pteris aquilina* L.), lantana (*Lantana aculeata* L.), and a small palm (*Phoenix humilis* Royle). On eastern Nilgiri slopes and on mountains west of Coimbatore there are large tracts covered by shrub savanna (Figure 5). Cleared tracts in dry and moist deciduous forests are frequently invaded by bamboos. *Bambusa arundinacea* Willd., growing 100 feet tall, colonizes more humid areas. The shorter *Dendrocalamus strictus* Nees colonizes drier
sections. Where shorter grasses grow between large clumps of these bamboo species, bamboo savannas may be said to exist. An unusually large area covered by bamboo thickets extends from the Nilgiri massif, across the Mysore Ditch, and into Mysore State. The general distribution of the bamboo thickets broadly delineates a migration corridor from Mysore State to the Nilgiri massif and the Wynaad Plateau. Biotic disturbances associated with men have doubtlessly occurred in the area for a long time, but concentration of bamboo thickets may also depend upon some hitherto undefined natural causes.

Above 6,000 feet, scattered temperate forests called sholas are separated by grasslands and agricultural clearings. Numerous tree species in these forests are distinctly temperate in type, and most shola trees are less than 40 feet in height. The continuous canopy forests are cool, dark, and open near the surface. *Glochidion neilgherense* Wt., *Meliosma wightii* Planch., *Michelia nilagirica* Zenck., and *Syzygium* spp. sometimes dominate. *Daphniphyllum glaucescens* Bl., *Gordonia obtusa* Wall., *Rapanea wightiana* Wall., *Symplocos foliosa* Wt., and *Ternstroemia japonica* Th. are common shola trees.

Temperate grasslands above 6,000 feet are associated with grasses kept short through annual fires and frequent grazing by livestock. In areas the least disturbed biotically, *Cymbopogon polymneurost* Stapf, *Heteropogon contortus* Beauv., *Ischaemum indicum* Merr., and *Themeda* spp. will flourish. The appearance of *Andropogon* spp., *Bothriochloa* spp., and *Eragrostis* spp. indicates increased biotic disturbance. Presence of *Cynodon dactylon* Pers., *Digitaria* spp., and *Eragrostis poaeides* Beauv. is associated with intense biotic
disturbance and soil erosion. *Andropogon polypticus* Steud. is the dominant grass in some boggy depressions and frost pockets. Besides grasses, a host of other plants ranging in size from minute herbs to short trees grow on the grasslands. Blooming *Strobilanthes* spp. periodically color entire slopes with their flowers. Bracken (*Pteris aquilina* L.) sometimes grows in colonies over burned areas on lower slopes. Imported broom (*Cytisus scoparius* Link.), gorse (*Ulex europaeus* L.), and eupatorium (*Eupatorium glandulosum* H. B. & K.) have become weeds, occasionally forming large colonies. Indigenous *Berberis tinctoria* Lesch., *Dodonaea viscosa* L., *Gaultheria fragrantissima* Wall., *Hypericum mysorense* Heyne, *Mahonia leschenaultii* Tak., *Oldenlandia stylosa* O. Kze., *Rhodomyrtus tomentosa* Wt., and *Sophora glauca* Lesch. shrubs grow singly on the grasslands, or form colonies. *Rhododendron nilagiricum* Zenck. trees--highly resistant to fire--are capable of growing singly far out on the grasslands, but also form loosely knit colonies. Scrub growth composed of *Rhododendron* mixed with the above-mentioned shrubs represents a transitional state from grassland to shola. Many black wattle (*Acacia mollissima* Willd.) and blue gum (*Eucalyptus globulus* Labill.) trees, indigenous to Australia, have been planted on grassland tracts (for information concerning introduction of plants, see Appendix B).
NOTES

1Holland (1900: 142, 151, 156, 166) considered Charnockites to be a suite of igneous intrusives ranging from acid to intermediate to ultrabasic and associated commonly with a particular hypersthenic rock he named charnockite. Subramaniam (1959: 326, 328-329, 345) defined charnockite "as a hypersthene quartz felspar rock with or without garnet, characterized by greenish flue felspar, and greyish blue quartz, the dominant felspar being a microperthite." The same writer applied the term Charnockite Suite to only the rocks in Holland's acid division, which consist of alaskite, charnockite, enderbrite, and quartzsyenite. Holland's intermediate division is considered a hybrid produced by mixing of pyroxene granulites with Charnockitic magma, while the basic division is a modified basement rock and the ultra-basic division, a syntectonic lens. Charnockites mentioned in this work belong to the larger rock suite.


3Cf. Mohr and Van Baren 1954: 356-357, "It is also reasonable to presume that many of the red loams of today will be the lateritic cuirasses [ferruginous and aluminous laterites] of a million years from now."

4Cf. Birch 1838: 94, "The laterite is the most valuable, as it can occasionally be used for building, when it is superficial, as then it can be wrought with little trouble when newly exposed." Ouchterlony 1848: 3, "A bed of this rock occurs near Kaitee sufficiently indurated to be fit for quarrying for building purposes—but no use is made of it by settlers owing to it being more costly than bricks." In 1963 the writer found some vermicular laterite on a wall at Koshthiemad, in the Kundah Range.


In order to standardize species classification, these works were consulted: Blatter 1926; Bor 1954; Bor 1960; Fyson 1932, 1, 2; Gamble 1896; Hooker 1875-97, 1, 2, 3, 4, 5, 6, 7.
The occupance patterns described in this chapter are related to Toda, Badaga, Badaga-Kasuva, and Kota pastoralism associated with temperate grassland, tropical savanna, or subtropical savanna formation. Todas, who herd only buffaloes, established hamlets, dairy-temple centers, and cremation centers on the temperate upper Nilgiris. They also started transhumance in which buffaloes are moved westward in the dry season and eastward before westerly monsoon rains start. Distinctive Toda dwellings and temples, forming types, are indicators of an ancient culture. Ancestral Todas may have domesticated buffaloes in the distant past. Clarified butter production in dwellings and dairy-temples has long been their essential economic activity. Continued acculturation in this century has resulted in some Todas turning to cash income through milk sales and agriculture.

According to folklore, ancestral Badagas came to the Nilgiris after fleeing persecution from Moslems in Mysore. Several migrations may have occurred after approximately 1200 A.D. On the upper Nilgiris the enterprising Badagas, who are the leading agriculturists, apparently learned to exploit temperate grasslands by borrowing ideas from Todas. The Bergani dairy-temple center, sacred buffalo herd, and ritual to ensure Badaga prosperity may be somewhat equated with Toda dairy-temple centers, sacred buffaloes, and ritual to ensure Toda
prosperity. Badagas also turned to horizontal transhumance motivated by seasonal variations in rainfall. Their temporarily used western livestock centers are called hundis. In the Mysore Ditch, north of the Nilgiri massif (Figures 1 and 2), the Badagas found another exploitable niche. Badaga livestock kept there all year are cared for by Kasuvas. Livestock centers with house types occupied by Kasuvas are related to the symbiotic Badaga-Kasuva relationship. Although agricultural Kotas may have inhabited the upper Nilgiris for over a millennium, only a few residents from Kirgoj graze buffaloes out of temporarily inhabited livestock centers on the temperate grasslands.

The following steps guide narration in this and later chapters: Generalized outlines of occupance patterns (equated with varying ways in which men have occupied landscapes) are followed by data relating to distinctive dwellings and sacred structures (occupance forms) labeled types. Discussion then shifts to economic activities altering landscapes around occupance sites to the greatest degree. Other economic activities altering landscapes to either a lesser or negligible degree are then discussed. Discourse turns to trades and services generated by members of the group under consideration and leading to economic intercourse with outsiders. Lastly, employment in economies generated by outsiders is considered. If a step is not applicable, it is omitted. In the case of Badaga, Badaga-Kasuva, and Kota occupance patterns described in this chapter, narration does not move beyond economic activities altering landscapes to a marked degree.

Because Nilgiri pastoralists have played such a vital role in
changing landscapes, this chapter closes with some comments on temperate grasslands, future grassland-shola ecology, and the tropical savannas.

1. The Todas

**Occupance patterns.** Both Keys (1812: xlvii) and Ward (1821: lxii) identified Todas as buffalo herders living mainly in the Mallanaud, a tract covered by grassland and shola (remnant forest) in the western upper Nilgiris. Most of their hamlets are now scattered around two adjacent peaks (Anaikal and a higher 8002 foot peak) in the Mallanaud, but some are located elsewhere (Figures 1 and 2). In the past, Todas occupied more extensive tracts. In 1843, after the English had established control of the Nilgiris, Todas were granted absolute but taxable occupational rights to their hamlets and certain grassland acreages nearby. The allotments were increased in 1863, but hamlet abandonment has taken place despite grazing land guarantees (Breeks 1873: 11-12; Francis 1908: 272). A major reason for this is that non-allocated grassland grazed by Toda buffaloes has areally diminished. Decreases in grassland acreages are due in part to reforestation projects, but many grassy areas were inundated by large reservoirs, and other tracts have been utilized for agriculture or settlement by non-Todas. Todas themselves have also changed enough to desire occupational sites nearer roads or urban centers (mainly Ootacamund), so have tended to abandon less accessible western hamlets for this reason.\(^1\) Abandoned hamlets and accompanying grassy acres have been reappropriated by the Madras Government, and then distributed
to non-Todas or used for tree planting. Thus, the cycle leading to more restricted habitat for the Todas and their buffaloes continues. Anticipating the time when grassland will greatly be reduced, the Madras Forest Department has fenced in a plot for experimental production of stall fodder. However, the Todas, who believe that buffaloes must exercise in order to be healthy and productive, have thus far refused to stall-feed their animals.

Harkness (1832: 12) stated that in Toda hamlets there were clustered dwelling-huts, dairy-temples, calf-pens, and buffalo-pens with piled stone walls. The hamlets stood next to sholas on gentle slopes, and grassland partially surrounded them. Muzzy (1844: 362) mentioned centers in which there were dairy-temples, small dwellings for priests, and round buffalo-pens. Breeks (1873: 2-25) described cremation centers with temporary huts to hold female and male corpses at green funerals, permanent funeral-temples for male dry funerals, temporary funeral-temples for female dry funerals, buffalo-pens or mock buffalo-pens, and azarams (rectangular or round enclosures with piled stone walls) for burning relics at dry funerals. Todas continue to dwell in similar hamlets and dairy-temple centers, and cremation centers are still used.

Ward (1821: lxxiii) and Hough (1829: 72) stated that Todas migrated westward in the cold, dry season and eastward when the westerly monsoon set in. Transhumance controlled by monsoonal changes thus took place. Although a few remote western hamlets are still temporarily occupied in the dry season, many have been abandoned. A few other hamlets, together with dairy-temple centers which are still
used, are also temporarily occupied. Male priests occupy the dairy-temple centers. Women accompany men to a few of the periodically inhabited hamlets.

A hamlet is sometimes surrounded by grass, but is more often located next to a shola (Figure 6 and Plate I, B). Every hamlet has one or more dwellings, one to three dairy-temples, one or more calf-huts, and at least one buffalo-pen. Dwellings, built close together, often are surrounded by high piled stone walls. Occasionally, the dwellings are aligned. The small, temporary hut dwelt in by a woman during the postnatal contamination period is located in the midst of a nearby shola. Any dairy-temple is usually surrounded by a piled stone wall or piled branch fence, and may be located close to a buffalo-pen. More than one dairy-temple in some hamlets results mainly from members in communities of the Tarthar moiety possessing two or even three grades of sacred buffaloes. Milk from each sacred buffalo grade is processed in a separate dairy-temple. Although members in each community of the Teivali moiety possess only one grade of sacred buffaloes, there may be two dairy-temples for sacred milk processing. Calf-huts are essential for holding calves which would receive injury if placed with mature buffaloes in buffalo-pens. Calf-huts may form a series, with each hut being used for calves in an older age grouping (Plate I, C). Most of these huts, made with upright planks or posts set next to each other, have a single slanted or gabled thatched roof. Their floors are occasionally covered with cobblestones. Barrel-vaulted calf-huts are now rare. Shelters for youngest calves are upon occasion constructed in embankment sides. Oldest calves may be placed
NÜLN
(Badagas: Neriguli)

Figure 6. A Toda hamlet
within a calf-pen. When constructing buffalo- or calf-pens, Todas sometimes take advantage of terrain by carefully placing the pens in depressions offering protection from the weather. Through necessity and sometimes with great effort, entire pens have been constructed out of piled stones or branches. *Stinging nettle* (*Girardinia heterophylla* Dcne.) thrives next to pens and sometimes serves as an effective barrier to escape, but Todas apparently make no effort to grow purposely this plant. Hamlets are invariably located close to a spring or stream. Besides requiring water for bathing, cooking, and cleaning utensils, water is used in dairy-temple ritual. The priest's sites for water collection differ from those used by commoners.

Two abandoned dairy-temple centers associated with the most sacred grade of buffaloes, the *ti* grade, are located in sholas at some distance from the nearest Toda hamlet. Nasmiòdr and Kanòdrs, associated with two other grades of sacred buffaloes, are dairy-temple centers still in use. Nasmiòdr, below the road from Anikorai to Ebbanad, is used for only a short period each year. This center, with a barrel-vaulted dairy-temple, a lean-to for the priest, and a buffalo-pen, is located in a small shola with large trees standing amidst fields cultivated by Badagas. Because Nasmiòdr was a hamlet in the past, a priest with sacred buffaloes stays there for a short time each year to honor the place and its past associations. Kanòdrs is an ancient center with a dairy-temple operation making it unique. More effort was exerted in the construction of Kanòdrs than any other center (Figure 7). The large stone-sided buffalo-pen has a bank to one side. The sacred oval has a bank surmounted by a shallow stone
Figure 7. A Toda dairy-temple center
wall around one half, and a massive piled stone wall running around the other side. Within this oval there is a recessed oval surrounded by a stone wall, and one of the three remaining conical temples stands in the recessed oval. While this dairy-temple center is occupied for a brief period each year, the priest sleeps in a lean-to with a small adjacent calf-hut. Although the sacred center is located in the midst of a dense shola not far from Ebbebad, trees have been removed from near the main structures and a strip out to open grassland. Because the site is seldom used, a thick shrub growth (*Eupatorium glandulosum* HBK. is common) has sprung up on the cleared land.

Besides distinct cremation centers for females only, there are others for the disposition of male corpses or relics. Some female cremation centers have buffalo-pens in which buffaloes destined for sacrifice may still be temporarily held. Male cremation centers may also have buffalo-pens, but if these are absent mock buffalo-pens are sometimes constructed with stones. In the thrice throwing of earth, performed only at male funerals, earth is thrown over the male corpse (green funeral) or male relics (dry funeral) placed in front of a buffalo-pen, mock buffalo-pen, or imagined pen. Temporary huts to house the deceased are no longer constructed for female or male green funerals. Female and male corpses are often cremated on a flat area, but sometimes there are particular circular or rectangular enclosures outlined with boulders wherein corpses are burned. Dry funerals are rarely held now. When held, the temporary funeral-temple constructed to house female relics will be burned afterward. Funeral-temples used to temporarily house male relics are left standing, and are
noticeable features at some male cremation centers.

**Dwellings.** After he visited the Nilgiris, Yacome Finicio (1603: 726) wrote this first description of Toda huts:

... They were like a large barrel half buried in the ground, ... . The hoops of the barrel were of thick reeds like Indian canes, bent into a hoop with both ends fixed in the ground. Pieces of wood from the brush were laid across these reeds and covered with grass. The front was made of stakes set on end, like organ pipes, with no other filling whatever. The door was a span [nine inches] and four inches wide, and two spans and an inch high, ... .

The barrel-vaulted hut type and its mode of construction remain unchanged. A picture of a front-gabled hut built prior to 1833 reveals that another hut type has long been used (Baikie 1834: illustration opposite 110). The two hut types may occur in the same hamlet (Plate 1, D). Of the two, barrel-vaulted huts are more numerous. Because front-gabled huts are never used as dairy-temples or funeral-temples, barrel-vaulted huts among the Todas may well antedate the other structures.

Planks used in hut construction were once fashioned entirely of timber from several shola species, but acacia or eucalyptus timber is sometimes used now. Some planks in Toda huts were obtained by felling trees with axes, splitting tree-trunks apart with wedges and then shaping, smoothing rough planks with adzes. Sawn planks are frequently used now, but the old method of obtaining planks has not been abandoned. Rattan (Calamus spp.) for hut construction is collected from outer Nilgiri slopes by Todas making special trips. Young acacia and eucalyptus trees provide ideal cross-poles, but shola
species are also exploited for these. Cross-bamboos (*Arundinaria wightiana* Nees) are easily procured from bamboo thickets next to upper Nilgiri streams. Grass used in thatching is almost invariably provided by one grass species, *Andropogon polypticus* Steud. var. *deccanensis* Bor, found in low-lying moist depressions on the upper Nilgiri grasslands.

The ends of a barrel-vaulted dwelling are constructed with upright planks placed next to each other in two rows. To conform with the barrel-vaulted roof, planks become shorter outward from central planks. Remaining openings in the walls are filled in with pieces of wood, clay, and buffalo-dung. In the front wall, a small doorway is built toward the left or right side. Then two clay sitting platforms are erected on the outside, to the left and right of the doorway. The barrel-vaulted roof, made with vaulted rattan supports, hardwood cross-poles, cross-bamboos, and grass thatch, also covers the front sitting platforms and projects beyond the back wall. A front-gabled dwelling hut has vertical end and side walls made of stone and clay, or of upright planks. Planked end walls are sometimes associated with stone and clay side walls. All planked walls have wooden pieces, clay, and buffalo-dung filling the chinks. Regardless of materials used, end walls taper down from their centers. Both side walls of equal height project beyond the end walls. A small doorway toward the left or right side is built into the front wall. On the outside, a clay platform is erected on each side of the doorway, and next to a frontward-projecting wall. The front-gabled roof, made out of hardwood cross-poles, a series of rafter poles, cross-bamboos, and grass
thatch, also covers the two front sitting platforms and projects beyond the back wall.

Barrel-vaulted and front-gabled hut interiors are basically the same (Figure 8). If the doorway is toward the right of a hut's front, an earthen sleeping platform (kitun) will extend over the interior portion left of the doorway. A mortar placed in the floor next to the sleeping platform is used to roughly divide the floor into a men's area (kikuter) and women's area (meilkuter). The men's area is used for churning milk from the family's secular buffaloes. The women's area contains a fireplace (waskal) for cooking, a platform and table for storing household utensils plus food, and possibly a massala stone (horizontal quern). In the upper, back part of the hut there may be a plank or some poles used to support clothing or other objects. If a hut's doorway is toward the front left, then all interior features are placed in reverse when compared to the distribution of these features in huts with doorways toward the right. The sleeping platform (meitun) to the right will have a mortar next to it, the men's area will be to the left-front, and the women's area will be to the left rear.

Some Toda dwellings vary from the barrel-vaulted or front-gabled hut types. Most numerous of the variants are side-gabled houses constructed for Todas by the Madras Government (Plate I, E). These houses are single or in rows resembling Badaga house-rows. Their roofs are tiled, and mortared brick or stone walls may or may not be whitewashed on the outside. The old spacial arrangement of interior features is usually preserved to some degree within them.
Figure 8. Toda dwelling huts at two hamlets.
Earthen sleeping platforms are frequently constructed to the right or left of entrances (usually full-sized doorways). The men's and women's areas are sometimes preserved exactly as they are in relationship to sleeping platforms in hut types. Side-gabled houses were certainly used before the Government started building them, and examples of these house types may still be seen in Toda hamlets (Rivers 1906: 29). Besides the single side-gabled house on an abandoned site close to Mòdr, there are occupied side-gabled houses in rows at Nersvem near Kodanad and Pastar near Sholur Tea Estate (Plate I, F). Roofs of these houses built by Todas are thatched. Walls are made of vertical logs or planks next to each other, or of wattle and daub between upright posts. Features within the houses may be arranged like those in hut types.

Permanent sites occupied temporarily each year may have very small dwellings. The priest's hut at Kanòdrs is a single-sided lean-to, and the priest's hut at Nasmiòdr is a double-sided lean-to. Kosh-thie has a front-gabled hut with piled stone walls and a thatched roof, while Umgâs has a similar hut with walls of upright logs. There are no sleeping platforms in any of these examples of huts temporarily occupied by males, so the occupants sleep on floors. Fires in small fireplaces, made by placing three or four stones together, serve for cooking and generation of warmth.

**Dairy-temples and funeral-temples.** Toda dairy-temples are either conical or barrel-vaulted. Breeks (1873: 15) recorded five conical dairy-temples, but one was then in ruins. Three of the conical dairy-temples are left, but Anto (a ti dairy-temple) is
disused, and Kanòdrs is used only briefly each year. The conical dairy-temple at Nòdrs, rebuilt in recent years, now has stone walls. It is a popular tourist attraction called 'Toda Cathedral' and is, therefore, not liable to become inoperative in the near future.

The Anto dairy-temple serves as a model for the manner in which Todas construct their conical dairy-temples (Figure 9). Its round wall consists of upright planks placed next to each other. The entrance was hewn through the thickest wall plank. Upright planks embedded next to each other in a straight row form a central partition dividing the circular base into two sections. A doorway hewn through the central, tallest partition plank permitted the officiating priest to crawl into the most sacred rear section. In his work, the priest used front and rear fireplaces. In the rear, a log edges a platform upon which ritualistic objects were stored. Crossed planks supporting a rattan hoop were lashed onto the central partition. Roof rafters running over the wall top and over the rattan hoop form the basis of the conical roof. To strengthen the roof, two rattan hoops around crossed planks were emplaced above the lowest hoop. Rattan closely spiraled over the rafters from the roof's bottom to the top was covered with row upon row of spiraled thatch held down by rattan (Plate II, A). A few rattan hoops dropped over the thatching completed the roof's construction.

Funeral-temples and other dairy-temples are externally constructed in the same way as barrel-vaulted dwellings, but there are some differences (Figure 10). Front sitting platforms are absent. Spaces between upright planks in funeral-temples are not filled in with
Figure 9. A Toda conical dairy-temple
Figure 10. Toda barrel-vaulted sacred huts at five centers
smaller planks, clay, or buffalo-dung (Plate II, B and C). Dairy-
temple entrances, hewn through planks, are smaller than those in
dwelling-huts; in shape, they are either rectangular, somewhat arched,
or round (rare). Lately, when reconstructing dairy-temples, Todas
have often replaced planks with stone slabs fashioned by members of
the stone-cutting caste. At Koshthie there is a dairy-temple having
a central large stone slab with entrance carved into it, while up-
right planks were used for the remaining wall. The entire front of
the Muini dairy-temple, built in 1952, is covered by stone slabs
joined together. Figures representing the five famous Hindu Pandavas
were sculptured onto the main stone slab above Muini's round entrance
(Plate II, D). Lastly, wooden decorative arrangements are more fre-
quently found over the front roof crests of dairy- and funeral-tem-
ples.

Within barrel-vaulted funeral-temples there are one, two, or
three compartments with flat floors (Figure 10). A kudrvars fire-
place is centered in a single-compartment, or in the larger front
compartment of any funeral-temple with two or three compartments.
Doorways are constructed with horizontal wooden braces placed between
two upright planks, and other wooden pieces may be nailed in to give
a doorway additional strength. Barrel-vaulted dairy-temples are also
divided into one, two, or three compartments. The unused Môdr dairy-
temple has a single compartment delineated into front and rear cere-
monial sections by two upright planks and a log laid horizontally.
In the front section there is a platform for sacred bamboo vessels
and two fireplaces (pelkkatithwaskal and toratthwaskal) next to each
The rear section is covered by a platform where the most sacred milk processing utensils are laid. Because Môdr, a ti dairy-temple, was one of the highest grade dairy-temples, the priest and his assistant had to live in a separate barrel-vaulted hut with two sleeping platforms and a kudrvars fireplace. The abandoned Pîrsush dairy-temple with two compartments appears to represent the most prevalent type of Toda dairy-temple. The main front compartment has a sleeping platform to each side of a central kudrvars fireplace. There is a small fireplace in the rear compartment, and a shallow platform runs most of the way around this compartment. Because Todas refused admission, details concerning features inside the Nôdrs dairy-temple with three compartments were unobtainable during fieldwork. This dairy-temple also serves as a male funeral-temple, and women mourn in its front compartment when a Toda male has died.

Theoretical past Toda economies. Ritualistic practices and a folk story indicate that the Todas may once have used bows and arrows for hunting. Fatherhood among these people is still determined by a man giving a ceremonial bow and arrow (Sophora glauca Lesch. branch bow, Cymbopogon polyneuros Stapf grass arrow) to the biological mother. A boy betrothed to a girl who has died will place the same type of bow and arrow on the girl's corpse (Plate II, E). At a dry funeral observed by Breeks (1873: 21, 23-24), a Toda placed three arrows in shooting position on a bow, and then dipped the arrow points into buffalo blood smeared over bark in which a skull fragment, some hair, and a fingernail of the deceased were formerly wrapped. In a folk
story collected by Breeks (1873: 36-37) the god Enta of the upper Nilgiris employed an old Toda to shoot an arrow into the eye of another Toda who had offended this god. Perhaps the Todas once lived primarily by gathering-hunting. In hunting wild buffaloes they may eventually have had a long and intimate enough association with these animals to bring about their domestication. There is no reason to believe that the ancestors were once agriculturists, or that Todas must have obtained domesticated buffaloes from agriculturists. Wild buffaloes still survive in Orissa, and their past distribution probably covered a larger region in peninsular India. However, Todas with domesticated buffaloes may have slowly migrated a long distance from wild buffalo country before reaching the Nilgiri uplands.

Multiple factors were probably involved in buffalo domestication. Factors suggested as being responsible for animal domestication are 1) the keeping of pets, 2) the impounding of wild animals so they could be used in sacrifice whenever the need arose, 3) the use of tamed animals as decoys in hunting, 4) animals moving close to men's dwellings when seeking protection from predators, and 5) men attracting animals to salt (Galton 1865; Hahn 1939: 89, 93; Hatt 1919: 97-109).

Certain relationships between Todas and their buffaloes may be cultural relics offering some insight into domestication processes. Adult buffaloes (mostly females) are individually named and sometimes treated with great affection. When certain buffaloes are chosen for sacrifice at funerals, males ritualistically mourn for them. Right hands of male corpses are touched to horns of sacrificed buffaloes,
and toes of female corpses are touched to nostrils of sacrificed buffaloes. With sounds of mourning, men attending funerals salute the dead animals by touching their heads to the heads or horns of sacrificed buffaloes. Lifetime incidents and attributes associated with favorite buffaloes will be recited long after they have died. Thus, there are close, ritualistically recognized, symbiotic ties between the Todas and their livestock. Buffaloes are, in a sense, practical pets upon whom the Todas depend.

Although Todas respect buffaloes and mourn their death, they do not always treat them kindly. In the later 1800s selected buffaloes were impounded for over a day, beaten mercilessly with large poles, and wrestled with before being sacrificed at dry funerals (Shortt 1868: 14-15; Walhouse 1874: 93-95; Rees 1892: 377-378). Sacrificial buffaloes are no longer impounded for over a day or beaten with large poles. They are now thrashed with sticks, are sometimes impounded briefly, and continue to be wrestled with. Wild buffaloes might once have been caught, penned, starved, and beaten to make them more manageable before being sacrificed. They were perhaps also impounded by hunters who wrestled with buffaloes in deadly sport. Sporting struggles between bovines and men have a long history in peninsular India. 4

By keeping buffaloes as pets, or taming them through impounding and mistreatment, it seems possible that hunting Todas might eventually have learned to use tamed animals as decoys. These animals, left grazing near a herd of wild buffaloes, could have attracted the latter into shooting range. However, a more likely use of the decoy animals
would be one in which they served as covers enabling hunters to slowly move up to wild animals or birds. If Todas once used decoy buffaloes, this is a domestication factor which appears to have no ritualistic or other remembrance today.

Protection offered by men's presence was probably an important factor leading to domestication. In the evening, if no men, women, or children drive Toda buffaloes in, the buffaloes will normally find their own way to home hamlets before nightfall. Feral buffaloes on the upper Nilgiris sometimes remain near human habitats at night, especially when leopards or tigers pose an alarming threat.

Salt in the ancient past could have been employed as a lure to attract buffaloes to ideal slaughter sites. If fed to tamed buffaloes, salt became an amenity strengthening symbiotic relationships. At Toda hamlets, salt is ritualistically fed to buffaloes five times per year. A hole is dug in the ground. Buffaloes, led up in turn, drink the salted water that has been placed in the hole. Buffaloes at the dairy-temple centers were treated in much the same fashion, except that buttermilk was occasionally added to the salted water. At these centers there were also additional occasions, with more elaborate ritual, when the sacred buffaloes were fed salt (Rivers 1906: 175-181).

It is conjectured that by taming buffaloes and exerting control over their breeding, the Todas finally domesticated them. The supply of meat for food would then have become a greater certainty. Because life-giving white milk was eventually considered as an acceptable offering to deities, and as primitive men are vitally concerned with their
future food supply, it is conjectured that an earth-bound fertility cult associated with milk became important to ancestral Todas. By establishing sacred buffalo herds and processing milk in dairy-temples, buffalo fertility and Toda prosperity were believed to be increased. As the fertility cult developed and Todas came to realize that milk and milk products could form their economic basis, it is postulated that the emphasis slowly shifted from buffalo meat eating to preservation of the former meat source. This shift may have corresponded with a shift to an economy supported primarily by herding. Ritual to ensure buffalo increase and Toda prosperity was improved upon, and became more complex through the centuries. Ancestral Todas did not desire to take chances and, therefore, worked out ritual to ensure that they had done all they could to bring about future prosperity. In essence, ancestors provided magic and made it as potent as they could. Because magic works both ways, sacred milk could also be deadly potent! Unprocessed milk from some sacred buffaloes is considered sufficiently potent to kill men who drink it. However, once this milk has been processed in a dairy-temple, clarified butter (ghee) produced as an end product may be purchased by non-Toda commoners.

**The historic economy.** Todas continue to rear buffaloes for their milk and not meat. No other animals, except a few cats and dogs, are kept. Buffalo calf flesh was once eaten after the seldom performed calf sacrifice (Harkness 1832: 139-141; Muzzy 1844: 363; Rivers 1906: 274-286). As there are now no active ti dairy-temples, this
sacrifice has been ended. Families own secular and sacred buffaloes—both types being sacrificed at Toda male funerals (Plate II, F).

Rivers (1906: 56-82, 83-122) found that the Teivali moiety had only one dairy-temple grade, whereas the Tarthar moiety had six grades varying in sacredness from the lowest tarvali to the most sacred ti. To complicate matters further, names of sacred buffalo herds providing milk for a certain dairy-temple grade vary from hamlet to hamlet.

Excepting the _ti_ grade, all other grades of dairy-temples are presently kept active. Secular buffaloes are looked after by family members, and their milk is processed by men within houses or huts. Sacred buffaloes are grouped into herds taken care of by dairy-temple priests and their assistants. In hamlets with more than one dairy-temple grade, a priest cares for each corresponding sacred buffalo herd. The sale of clarified butter processed from both secular and sacred buffalo milk has remained an important source of Toda income since the early 1600s. According to Finicio (1603: 723), clarified butter purchased from Todas by the Badagas was sold in Malabar. Hough (1829: 72) noted that clarified butter produced by the Todas was well-known on adjacent lowlands and "transported great distances, even as far as Bombay." The Ootacamund market later became the main center for sale of their clarified butter. Some Todas now supply coffee and tea shops with fresh buffalo milk. In the Ootacamund Cooperative Society there are 50 Toda members, but close to 60 Todas supply milk to the Society. Todas are also planning to create their own cooperative milk society.

Todas have long enjoyed usufruct rights to certain shola lands.
English administrators opposed them when, prior to 1882, they rented some of these lands to cultivators who cleared and planted them to potatoes or other vegetables. As a result, after 1882 the English imposed heavy fines upon any lands so rented. However, Todas retained the right to clear and cultivate shola lands set aside for their use—if and when they decided to turn to agriculture (Francis 1908: 212-213). By providing fertilizer and seed potatoes, the Madras Government has recently encouraged Todas to cultivate these lands. Over 250 acres of land adjacent to inhabited hamlets are ostensibly being cultivated by Todas, but it is no secret that Badagas who pay Todas for land-use, fertilizer, and seed-potatoes are doing most of the cultivating. However, some Todas are now cultivators, and a man at Pyordkars has even turned to tea planting.

Gathering has continued to the present. Ward (1821: lxxiv) stated that Todas "also subsist in a great measure on a variety of bulbous fruits procured by digging, large quantities being obtained on all the hills in the Todawanaad." In discussing Toda foods, Thurston (1909, 7: 125-126) mentioned that they ate "wild vegetables and pot-herbs, which, . . ., the Todas may often be seen rooting up with a sharp-pointed digging-stick on the hill-sides." Besides exploiting roots and leaves of plants (species undetermined) growing on the upper Nilgiris, Todas may dig up Dioscorea roots at lower elevation. More than ten upper Nilgiri wild plants produce edible fruits (Krishnamurthi and Sampath 1953: 133-138). Honey collected by Todas is a sweetener, an ingredient of delicacies, and a ritual substance.
Todas had apparently stopped hunting game by historic times. If they were part-time hunters when first arriving on the upper Nilgiris, they would have found game in abundance. Among the game animals are two deer, muntjac (*Muntiacus muntjak* Zimm.), sambar (*Rusa unicolor* Kerr.), and a wild goat, the Nilgiri tahr (*Hemitragus hylocrius* Blyth). Gaurs (*Bibos gaurus* H. Smith) from lower Nilgiri slopes and adjacent lowlands once periodically ascended to higher elevations, but no longer do so.

Harkness (1832: 15) observed Toda women stitching edges of cloths to be used for clothing, so needlework among the women is not something taught them by missionaries. However, missionaries have done much to encourage embroidery among the women. The Church of South India, Ootacamund, provides cloth and thread to Toda women, who receive a portion of the proceeds from embroidered cloth sales. The Madras Government has also established stores to sell products made by Todas and other tribals. Some Todas have become salaried employees performing such tasks as gardening or forest watching. One is an educated evangelist working for the Seventh Day Adventist Mission in Coonoor, and another is a nurse trained in England. An income source for a few Toda families is the money paid by tourists visiting the more accessible hamlets.

2. Badaga and Kasuva Pastoralists

By taking advantage of temperate grasslands, Badagas were able to establish a dairy-temple center at Bergani and elsewhere practice transhumance like the Todas. They have also made economic gains by
employing Kasuvas and exploiting the grazing potentials offered by tropical savanna woodlands, bamboo thickets, thorny thickets, and related savannas of the Mysore Ditch.

The Bergani dairy-temple center. A sacred buffalo herd is maintained at the Bergani dairy-temple center honoring the goddess Masthi Hethai. At the center there is a building with an inner dairy-temple, priest's quarters, and rooms to shelter buffalo calves (Plate III, A). Several buffalo-pens stand close by. Down slope there is another building where pilgrims may sleep. Inside it is a sacred room where an employed Chetti annually weaves new clothing for the goddess's image and the attendant priest. Food for hundreds of pilgrims who attend an annual festival is cooked in a nearby shed with aligned fireplaces.

Features inside the dairy-temple are identically related to the arrangement of features within Badaga row temples described in a later chapter. The dairy-temple center and a herd of over 70 buffaloes are supported through monetary gifts and buffaloes donated by devotees. Todas sometimes give buffaloes. Most gift buffaloes are garlanded and presented to the priest during a week preceding the festival honoring the goddess. The young priest, who may serve for a year or more, looks after the sacred buffaloes and processes their milk inside the dairy-temple. He never returns to secular life during his term in office, and must give up the priesthood on Masthi Hethai's Monday if he starts dreaming about girls or wishes to get married. The youth milks sacred buffaloes in the morning and evening, takes buffaloes to and from
pasture on neighboring slopes, and processes milk into clarified butter. This, as the sacred clarified butter of the Badagas, is used in lamps within the dairy-temple and for ritual at Badaga festivals or temples. Any Badaga male may visit the Bergani dairy-temple and drink buttermilk given to him by the priest. Because women are polluting, no woman may enter the dairy-temple complex itself. However, women of nearby Bergani hamlet come daily to an established point at an uncontaminating distance from the dairy-temple and there receive buttermilk for household consumption. Buttermilk from processed sacred milk is also drunk by the priest. The priest never eats meat while in office and cooks his own vegetarian food. All grains, vegetables, and other foodstuffs needed by him are supplied by visitors or neighboring Bergani Badagas.

The festival honoring Masthi Hethai takes place on a Monday in mid-January. Badaga males from all over the Nilgiris come with their Hethai sticks to worship the goddess (Plate III, B). Women may also attend, but must remain an uncontaminating distance away from sacred places. Men and women wear new white clothing, must not bring anything made with leather, and eat no meat during the festival. At the festival's climax, two entranced priests believed to be possessed by Masthi Hethai predict crop yields in the coming main crop season (karbokam) and inform a few men that their wives will shortly conceive. Daily and festival rituals at Bergani are thus parts of a fertility cult related to the Badaga's economy and future prosperity.

Badaga hundis. The Badagas have for a long time used seasonal
centers called **hundis**, which consist of temporarily occupied huts and cattle-pens. The **hundis**, located on western upper Nilgiri grasslands, are inhabited while buffaloes and cattle are grazed near them in the dry season (Figure 2). The herds are brought westward in February or March and are herded eastward in May or June. During the days of the British Raj and before large grassland tracts had been planted with acacia or eucalyptus trees, there were more **hundis** than at present. A listing of former **hundis** known to Ithalar and Nanjanad Badagas, along with abandoned **hundi** sites seen during fieldwork, testify to this fact. All persons using **hundis** must obtain grazing permits from the Madras Forest Department in Ootacamund. A basic fee of 2.50 rupees and an additional charge of 50 nayapice (100 nayapice equal one rupee) per buffalo and 25 nayapice per cattle head is paid for a three-month permit. Badagas using grasslands must follow all the Madras Forest Department and Nilgiri Game Association regulations. Because the Madras Forest Department desires to end, slowly and tactfully, the use of **hundis**, opportunities are pressed when Badagas living in them are found trespassing the law. Grazing permits may then be revoked, but a series of fines will also discourage Badagas from using the western grasslands.

The occupancy pattern at each **hundi** is basically the same, but there is no distinct hut type associated with **hundis**. In establishing Bhavani Hundi, used in 1963, Badagas took full advantage of terrain (Figure 11). The **hundi** is located in an area with more grassland than shola, where no trees have been planted yet (Plate III, C). The cattle-pen is bound by steep slopes down to two streams, a piled stone
Figure 11. A Badaga seasonal livestock center
wall, and a bough barricade. The dwelling-hut has a low sleeping level, the necessary churn-pole for processing milk, and a fireplace set in a low platform. Five calf-huts surround the dwelling-hut, and there is also a separate calf-pen. All the hut walls were constructed with posts placed next to each other, and roofs were thatched. Kin-kara Hundi, also used in 1963 and located close to Bhavani Hundi, is situated next to a stream and extensive shola (Figure 12). Post, branch, and log fences enclose a large circular cattle-pen, a smaller cattle-pen, and a calf-pen. There are three calf-huts next to a dwelling hut. The calf-huts have post walls, and the dwelling-hut has stone walls. Grass thatching was placed over all the roofs.

During the 1963 season only one group of Badaga shepherds was contacted by the writer (Plate III, D). The seven men taking turns in living at Kinkara Hundi were herding 92 buffaloes and 40 cattle. Livestock driven westward in February were to be taken back in May. The herders came from Ithalar and Poratti, where they left wives and other relatives during the dry season preceding the main agricultural season. Milk was daily supplied by the Badagas to tea shops near the upper Bhavani dam site, where all activities ceased during the westerly monsoon. Clarified butter was sold in the Ootacamund shandy. The daily walk to the tea shops was about six miles one way, while on periodic walks to Ootacamund by a different herder each time a distance exceeding 20 miles was covered. Grains and other edibles were obtained from homes, stalls near the dam site, and the Ootacamund shandy. Milk and milk products, excluding clarified butter, also formed a part of their diet. Livestock were being milked only in the
Figure 12. Another Badaga seasonal livestock center
morning, but this was due to the fact that pasturage was poor at the time (March). The herders expected grazing to improve as new grass sprang up from ground they had burned over. Herding is a simple task, unless there is a panther or tiger in the vicinity. Livestock may be left for long periods after being driven out in the morning and will usually graze their way home in the evening.

Badaga-Kasuva livestock centers. Kasuvas living in the Mysore Ditch between the Nilgiri massif and Moyar River (Figures 1 and 2) work on plantations in the area, serve Badagas as livestock herders, and sometimes cultivate their own dry field crops with hoes and plows. As the Kasuvas are also called Irulas, it is likely that they represent an offshoot Irula group which finally assumed a lower caste standing. Kasuvas have seldom been mentioned in the censuses. However, 316 persons who spoke the Kasuva language were listed in 1891, and 290 Kasuvas were enumerated in 1911 (Rao 1909: 178; Moloney 1912: 83). There are probably fewer than 500 Kasuvas now living in the Nilgiri District.

Despite biotic disturbances caused by annual fires and grazing, several livestock centers where Kasuvas take care of Badaga cattle are within savanna woodlands rather than on open grasslands. Other centers are situated amidst bamboo and thorny thickets in which there are grasses and adequate shade for livestock. Herds of elephants (*Elephas maximus* L.) and gaur range over the area. Pens for holding livestock at night are constructed with posts and lashed on poles or bamboos, often surrounded by brush piled densely to a height of six feet or
more (Plate III, E). Large ovoid pens are typical; one measuring 110 feet by 80 feet was observed. Dwellings built next to pens are often of a side-gabled type with thatched roof. Their walls are of stone and clay, woven bamboo, or woven bamboo and daub (Figure 13). A central section opened to the front has a shallow platform and occasionally a fireplace. Herders use this section to churn milk or produce clarified butter. They sleep on the platform in hot weather, and sometimes sit there close to a fire while observing elephants at night. To one side of the central section there is a sleeping room and to the other a calf room, but additional calf rooms may be built into the dwelling at either or both ends. Kasuvas also live in dwellings varying from the one generally associated with livestock centers. A small, front-gabled dwelling forms a distinct type (Figure 13). This has a steep-sided thatched roof, and half the structure usually lacks walls (Plate III, F). The remaining half with woven bamboo or woven bamboo and daub walls has a fireplace set into a low platform located next to two walls.

Buffaloes and cattle are herded by Kasuvas working for Badagas, but at periodic intervals Badaga masters from the upper Nilgiris tend to spend some time with their livestock. Badaga wives and children do not come down, but entire Kasuva families live in the livestock centers. Badagas pay Kasuvas for their services with cash and in kind. One interviewed Kasuva family received six rupees per week plus Badaga-grown grain and vegetables, while another family received ten rupees per week plus Badaga agricultural products. Furthermore, frequent issues of rice and yearly issues of clothing are given. On a
Figure 13. Houses at two livestock centers in the Mysore Ditch
special occasion such as marriage, gifts are usually bestowed.

Unlike the upper Nilgiri hundis, livestock centers in the Mysore Ditch are used all year. Before livestock may be herded, a general permit costing three rupees and a charge of 25 mayapice per buffalo or cattle head must be paid annually to the Forest Department in Ootacamund. Comparatively large herds are kept. At one livestock center in 1963 there were ten buffaloes and 150 cattle, while 40 buffaloes and 140 cattle were kept at another. Excess of cattle over buffaloes may perhaps be explained by the fact that the Mysore Ditch is a rather dry region. The livestock centers are used for breeding, and grass near them provides alternate grazing for Badaga livestock. Frequent livestock movements between the upper Nilgiris and Mysore Ditch thus takes place. Dry cows are taken down, and good milk yielders are brought back up. When grazing is poor on the upper Nilgiris, but better in the virtually uninhabited Mysore Ditch, livestock will be sent down in larger numbers. There are always some milk yielders in the Mysore Ditch livestock centers, so dairying is a necessary activity. Milk and buttermilk may be consumed by Kasuva caretakers. Clarified butter carried up by Badagas or Kasuvas is either sold or consumed by Badagas.

3. The Kotas

Kotas have taken advantage of the temperate grasslands to only a limited degree.
Kirgoj pastoralists. A few Kotas living at Kirgoj use nearby Mallanaud grasslands for grazing buffaloes. Although they also own cattle, only buffaloes are kept on the grasslands. Apart from miscellaneous dwellings, stalls, and pens, there is nothing distinctive about the Kota livestock centers. Using an example, the dwelling and stalls in the livestock center nearest Kirgoj are aligned into a single row with clay and stone walls covered by a sheet metal roof (Plate III, G). Nearby there is a round piled stone pen and another partially walled pen next to a bank. In June, 1963, the livestock center farthest out on the Mallanaud was used for grazing 105 buffaloes belonging to four families. When monsoon rains became too intense, buffaloes brought out in March were to be taken to the above-mentioned more protected center and kept there most of the remaining year. However, some buffaloes would be taken into the community when monsoon rains improved nearby pastures sufficiently for grazing buffaloes and cattle. Buffalo owners take turns caring for them, so there is always at least one man with the buffaloes. Women and children remain in the community. Buffalo milk and milk products are easily disposed of in Kirgoj and nearby tea plantations.

4. Grasslands

The evidence indicates that Nilgiri temperate grasslands and subtropical or tropical savannas with shrubs or trees have resulted from biotic disturbances active over a long period. Recent reforestation of temperate grasslands with imported Australian species tends to prove that trees once thrived on tracts now covered by grasses.
If imported species continue to be planted, they may some day be the dominant vegetative forms on the upper Nilgiris.

Temperate grassland formation. Annual fires set by men have certainly contributed to grassland formation on the upper Nilgiris. There is much historical evidence for the burning of old, tough, dried grasses to promote the growth of young, tender grass more edible for livestock (Appendix C). Badagas, Kotas, Todas, Cannarese, Malayalees, and Tamilians inhabiting the upper Nilgiris still burn grasses annually. Firing of grasslands is such a deeply ingrained practice that the Madras Forest Department encounters many difficulties in trying to enforce laws to protect forested or planted tracts. A record dating to A. D. 1117 contains the earliest mention of a Nilgiri ethnic group (Derrett and Duncan 1957: 47). The Todas referred to were in all likelihood pastoralists who fired grasses annually. If one thinks in terms of grasslands being burned over annually for centuries and possibly millennia, it is not difficult to envision grasslands expanding at the expense of adjacent forests. Every time flames cross grassy areas and reach shola edges they do some damage to trees. In turn, damaged trees are more easily attacked by diseases and insects. Slowly, through the years, trees along shola edges perish and grasses can then advance a little more.

Terrain on the upper Nilgiris is conducive to fire spread, for the region is characteristically eroded into rounded highland hills and mountains. Whenever forests are destroyed, sheet erosion removes soil, and relief features then tend to become more rounded. Although
winds blow with highest velocities during easterly and westerly monsoons, those in the dry, grass-burning season blow long and steadily enough to fan flames over the undulating terrain. Surface configuration plays a vital role in the eventual highly uneven distribution of grasslands and sholas (Plate IV; A, B, and C). In a section where disturbance is negligible, shola may stretch across large expanses between two streams (interfluvial shola). With increased disturbance, grassland spreads between stream courses. When flames reach valley edges, downward slope halts or slows their spread sufficiently to enable shola survival in valleys. Sholas will eventually be located mainly in valleys and may then form a dendritic pattern (dendritic shola). The importance of surface configuration is also revealed by the fact that small sholas (patch sholas) manage to exist in interfluvial depressions where vegetation is protected from upward moving flames. If fires through time are able to change vegetation on the landscape, one would suspect that they could ultimately produce grasslands in depressions and valleys. In the Nilgiris such is apparently the case, for occasional valley bottoms and adjacent hillsides are almost entirely in grass. Where such extreme changes have occurred, streams may become intermittent.

Not all grasslands were slow to form; some grassy tracts probably came into existence within a decade. Todas long have employed axes to fell trees, so they could obtain planks for hut construction, logs and branches to build fences, or firewood to heat food, produce warmth, and cremate their dead. Badagas, Kotas, and more recent migrants to the Nilgiris cleared large tracts for crop production, and
have utilized wood for the same purposes as Todas. Some abandoned agricultural tracts are now covered by grass, while others are covered by shrubs or tree growth. Annual firings and grazing play vital roles in grassland formation and maintenance. Examples of rapid forest removal leading to grassland formation are offered by clearings presently formed by Badagas near Toda hamlets. After trees are axed down and disposed of, potatoes are cultivated. As cultivation continues, surviving scattered trees are slowly cut out. If after a few years cultivation is suspended due to soil deterioration or non-renewal of a contract with Todas, the once cultivated plots may rapidly become grass covered (Plate IV; D, E, and F). New grassland formation and maintenance result from buffaloes grazing on grasses which have sprung up over the plots, coupled in many cases with periodic burning of the grasses.

Megalithic Cult members once living on the upper Nilgiris may have been farmers and livestock rearers. The question of whether Megalithic monuments were erected before or after ancestral Todas came to the upper Nilgiris remains unanswered. Apart from fragments of numerous pottery buffaloes in Megalithic sites, there is little conjectural association between the monument builders and Todas - unless ancestral Todas are assumed to have been bronze-iron age warriors whose descendants abandoned warfare and turned to herding only buffaloes. Construction dates for Nilgiri Megalithic sites have not been established, but may tentatively be related to a period covering a few centuries before and after 1 A.D. On lids of funerary urns buried within stone circles on mountain tops (Plate V, A), figures resembling horses,
humped cattle, buffaloes, sheep, dogs, and chickens were fashioned with clay. The funerary urns are sophisticated in design, and other buried pottery was often more elaborately made than the pottery presently used on the Nilgiris. Bronzeware from the stone circles varies greatly in shape and is in some instances intricately decorated. Iron objects found in Megalithic sites range from broad-bladed daggers, chopping knives, sickles, razors, long and short spear points, and arrow points, to small lamps (Breeks 1873: Plates XXXVI-XLIII). The artifactual evidence, therefore, indicates that Megalithic Cult members may have cleared forests for agriculture and to obtain wood for domestic necessities. Livestock were possibly grazed on annually burned grasslands derived from cleared lands and natural openings in the forest. In this connection it may be noted that many Megalithic sites are located on peaks within the northern grasslands and near valleys in which agriculture is presently continued.

**Recent reforestation of the temperate grasslands.** The question as to whether or not upper Nilgiri grasslands may be reforested has been partly answered. It is certain that most of these grasslands could be rapidly covered by acacia and eucalyptus trees. Thousands of former grassland acres have already been planted with these trees, imported from Australia (Plate V, B and C). The clearest historic record of vegetational change through imported tree growth is offered by Ootacamund, the largest city in the Nilgiris. Eight views drawn or painted in the 1830s clearly reveal that the area was then covered by grassland and scattered sholas (Jervis 1834: illustration opposite
Grasses covered most sections sloping down to Ootacamund Lake, and St. Stephen's Church was surrounded by grass-land. Through funds made available by the Madras State Government, approximately 8,000 acacia and eucalyptus trees had been planted around Ootacamund before July, 1857 (Cleghorn 1861: 176). After his 1860 visit Sir Clements Markham (1862: 357) noted that "except to the N.W., the station is completely surrounded by grass-covered hills. Houses are scattered about under the shelter of the hills, with gardens and plantations of Eucalyptus and Acacia . . ., around them [the houses] . . . ."

A photograph and a painting reveal that imported trees had become well established next to Ootacamund Lake by 1875, but grassy patches were still noticeable features on the landscape (Price 1908: illustration opposite 32; Murphy 1953: illustration opposite 196). Photographs taken in 1905 prove that Ootacamund had become a forested city (Price 1908: illustrations opposite 33, 73, and 159). Slopes next to the diminished lake and portions of the former lake area filled with earth were, with the exception of the racecourse, mostly covered with either trees or houses. On the mountain behind St. Stephen's Church many eucalyptus trees were growing, and tall cypresses grew in the churchyard.

Although hundreds of foreign plants now grow in Ootacamund, certain species predominate. Most common acacias are the green and silver wattles (Acacia decurrens Willd., A. dealbata F.V.M.), but black and golden wattles (A. mollissima Willd., A. pycnantha Benth.) are also raised. Cypresses flourish, the Monterey cypress (Cupressus macrocarpa Hartw.) being grown all over the city as an ornamental, a
firewood-producing tree, or as an easily managed hedge plant. Weeping cypress (*C. funebris* Endl.) grows in St. Stephen's churchyard and elsewhere. Blue gum (*Eucalyptus globulus* Labill.) is the most frequently planted eucalyptus species. Some blue gums, such as those growing on the eastern edge of the Botanical Gardens, are among the tallest trees in India. Cinchona (*Cinchona* spp.) and tea (*Camellia sinensis* O. Ktze.) are grown on adjacent mountain slopes.

**Future temperate grassland-shola ecology.** If biotic disturbances ceased for several centuries, it is likely that sholas would slowly spread onto areas now covered by grasses. Since biotic disturbances are so abundant, sholas will probably diminish further in size. Most shola trees are economically useless when compared to fast-growing Australian species. Thus, in all likelihood the latter will be fostered to the general detriment of shola species. Because the human population on the Nilgiris is increasing, hunger for agricultural and pastoral lands tends to further shola destruction. One proof of this is offered by the Malayalee or Tamilian squatters who have been invading the Nilgiris and clearing sholas in places where they have settled. To prosecute such settlers generally requires long and costly litigation, so offenders are often left alone. The Madras Forest Department and individuals will plant acacias and eucalypti on abandoned agricultural or pastoral lands.

Whether or not shola species could spread into and eventually overcome acacia and eucalyptus stands is debatable. The imported plants, which thrive under semi-arid conditions in Australia, grow in
the upper Nilgiris because of an annual dry season and the fact that they are planted on grasslands where conditions are less humid than in shola interiors. Less humid conditions tend to be continued in acacia and eucalyptus stands. Grassland soils are not conducive to shola growth, and soils under imported tree species tend to remain insufficiently improved to support a shola association. Under eucalyptus trees erosion is sometimes so intense that soil conditions for shola species are actually worsened. However, certain indigenous plant species may be able to successfully compete with imported trees. Through slow plant succession conditions below and above ground level may ultimately be bettered enough for a shola association to be favored over foreign trees.

Many shola species are extremely exacting in their growth requirements. For instance, outstanding requirements of many temperate evergreen species are soil and above-surface humidity conditions not met with on open grasslands. To provide these conditions alone, it would appear that a long, slow, uninterrupted succession of plants would have to live and die before a shola association could become established. Plants playing an important role in this succession would be the colonizing, fire-resistant rhododendrons, shrubs, and herbs now growing on the grasslands (Plate V, D). Fires and grazing animals now generally prevent the succession from taking place.

Tropical and subtropical savannas. The vegetative cover of savannas varies from dominating grasslands to dominating forests with grasses and shrubs between trees. Bamboos found in more humid areas
are sometimes conspicuous on savanna lands. Savanna variations reflect varying degrees of biotic disturbances and the ability of some plants to survive under less humid conditions than those existing in nearby forests. When biotic disturbances are intense, as for example on Rangaswami Betta where annual fires are set and livestock are frequently grazed, grasses dominate. Teak and other deciduous species in particular, which adjust well to dry seasonal conditions, have a tendency to survive or thrive in periodically fired areas. Grasses and shrubs then grow between dominating deciduous trees.

For the Nilgiris and Wynaad there are a few accounts covering processes leading to savanna formation (Appendix C). Agricultural or pastoral needs, as on the upper Nilgiris, have been responsible for forest removal and spread of grasses. In the southeastern Wynaad, where large tracts planted to cinchona or coffee were abandoned, annual fires eventually burned off the planted species, and grasses then took hold. Thus, trees were removed to enable the establishment of plantation gardens, and grasses moved in after planted species perished (Appendix C, Fletcher). In the Wynaad, past shifting slash-burn cultivation also caused forest removal and savanna formation (Appendix C, Morgan). Annual fires combined with grazing by livestock were everywhere vital to spread and maintenance of grasses in cleared areas. The same processes led to savanna formation on outer Nilgiri slopes (Plate V, E and F) and in the Mysore Ditch. Savannas in these regions have provided fodder to livestock 1) driven up from nearby lowlands, 2) kept in Badaga, Irula, Kasuva, and Kurumba hamlets, and 3) reared on plantations which were developed after the
English came. Abandonment of plantation coffee gardens due to coffee leaf disease (*Hemileia vastatrix* B. & Br.), which reached a climax in the late 1800s, and devastations made by the green bug (*Coccus viridis* Green), especially between 1900 and 1910, led ultimately to savanna formation. Savannas have frequently been created by Irulas and Kurumbas. Although they have been forced to stop shifting slash-burn cultivation and are now confined to lands they own, cultivated plots are still rotated. Some unused plots are fired or grazed sufficiently for savanna to result. However, both ethnic groups are also responsible for savanna formation in 1) forests affected by annual fires and grazing, on 2) plots abandoned when shifting slash-burn agriculture was still practiced, and on 3) cleared tracts where plantation crops once existed.
NOTES

1. The trend had started by 1905 (Rivers 1906: 23-24).

2. A Toda green funeral ends with the deceased's cremation. Relics of the deceased, such as hair and portions of the skull, are kept for the second dry funeral. Ritual performed over the relics in a dry funeral resembles ritual used in the green funeral, and the relics are finally burned in an azaram. Kotas also have green and dry funerals. In contrast to Todas, the dry funeral honors all who have died during a year. Thus, on a set date, funeral ritual is performed over the relics of Kota community members who have died since the last dry funeral.

3. For convenience, the terms used by Rivers (1906) are adhered to in this section pertaining to Todas. For information regarding ritual and uses of the two fireplaces in the Môdr dairy-temple, see Rivers 1906: 91-92.

4. Wrestling with bulls on pastoral tracts in the sixth century A.D. is described in the Tamilian work, Mullaikkali. The sporting bulls varied from the wild gaur, or a close relative, to a fully domesticated bull with white spots on brown skin. That the sport was dangerous is emphasized by the fact that eventually the bulls' horns became "red with blood and had guts winding around them." As "the son of the buffalo-herd" is also mentioned, the same people were probably herding buffaloes (Iyengar 1929: 578-580).

5. The Ras Phasé Pardi tribesmen of Maharashtra still employ cattle and cloth screens to approach game (Kosambi 1967: 104).

6. This data was obtained from Kwodron, Seventh Day Adventist Mission, Coonoor, 1965.

7. Murray B. Emeneau has written about Christian Todas who turned to agriculture (Emeneau 1939: 93-106). For information concerning agriculture near Toda hamlets, the writer is indebted to Anthony Walker.

8. In 1865 a hunter described a fight to the finish between a gaur and tiger near a camp located by the small Upper Bhavani Stream on the upper Nilgiris. The hunter's friend shot two gaurs near the fight location (Old Shekarry 1865: 241, 252-257).

9. The tentative period is based upon an approximate period established through archaeological work conducted by Sir Mortimer Wheeler and artifactual finds (Wheeler 1959: 162-163).
For identification of tree species around Ootacamund, thanks are due to B.G. Narayana Menon, Curator of the Government Botanical Gardens.
CHAPTER IV

IRULAS AND KURUMBAS

In contrast to the pastoralists, Irulas and Kurumbas who occupy steep slopes on the outer Nilgiris have for long altered the landscape through gardening and crop production on dry fields (Table I). Besides maintaining their early 1800 economic activities to varying degrees, they have also turned increasingly to work on plantations. The Irulas inhabit hamlets on eastern slopes, and many of them live within sight of the imposing Rangaswami Betta (God Ranga's Peak, 5,865 feet). Kurumbas dwelling mainly on southern slopes inhabit hamlets, semi-nucleated communities, or dispersed houses, all of which may be separated from each other by deep valleys or ranges (Figures 1 and 2).

Because of the diverse vegetation in the dry or moist deciduous forests and subtropical evergreen forests which once covered the outer Nilgiri slopes, gathering and hunting men in small numbers could have subsisted on nature's bounty. Thus, Kurumbas in particular, who racially appear to be descended from ancient inhabitants of southern India (Plate VIII, A), are probably the survivors of a gathering and hunting group. In fact, some Kurumbas may still have lived by gathering and hunting in the early 1800s, but there is no positive evidence that they did. However, in addition to shifting slash-burn agriculture, these two economic pursuits were vital to the Kurumba economy at that time. Although the Irulas may also form a relic group, which remained culturally distinct through isolation from ancient times,
### TABLE I
PRESENT DAY PASTORALISTS VERSUS IRULAS AND KURUMBAS
Categories omitted are not applicable.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>OCCUPANCE SITES</th>
<th>ASSOCIATED CENTERS</th>
<th>OCCUPANCE TYPES</th>
<th>MAIN ASPECTS OF THE ECONOMY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TODAS</td>
<td>-Permanent and seasonal hamlets</td>
<td>-Separate female and male cremation</td>
<td>-Barrel-vaulted, front-gabled, and side-gabled dwellings</td>
<td>-Sacred and secular buffalo rearing</td>
</tr>
<tr>
<td></td>
<td>-Dairy-temple centers</td>
<td>and male cremation centers</td>
<td>-Conical and barrel-vaulted daily-temples</td>
<td>-Sale of clarified butter; some sale of fresh milk</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-Barrel-vaulted funeral-temples</td>
<td>-Income from land rental</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>-Limited farming; potato cultivation to tea planting</td>
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<td></td>
<td></td>
<td></td>
<td>-Limited gathering; roots, fruits, honey</td>
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<td>-Sale of cloths embroidered by women</td>
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<td>-Employment in occupations ranging from gardening to nursing</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>-Income from tourists</td>
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<tr>
<td>BADAGA PASTORALISTS</td>
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<td></td>
</tr>
<tr>
<td>1) Bergani</td>
<td>-One permanent dairy-temple center</td>
<td>-Inner dairy-temple functionally the</td>
<td>-Sacred buffalo rearing</td>
<td>-Production of clarified butter for rituals</td>
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<tr>
<td></td>
<td></td>
<td>same as side-gabled temples in house-</td>
<td>-Income from an annual festival; donations from worshipers</td>
<td>-Income from tourists</td>
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<td></td>
<td></td>
<td>rows (see Table IV)</td>
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<tr>
<td>2) Hundis</td>
<td>-Seasonal livestock centers</td>
<td></td>
<td>-Buffalo and cattle rearing</td>
<td>-Sale of clarified butter and milk</td>
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<tr>
<td>3) Badaga – Kasuva liaison</td>
<td>-Permanent livestock centers</td>
<td>-Front-gabled and side-gabled</td>
<td>-Buffalo and cattle breeding</td>
<td>-Buffalo and cattle breeding</td>
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<tr>
<td></td>
<td></td>
<td>houses</td>
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<td>-Reserve grazing for upper Nilgiri livestock</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>-Sale of clarified butter</td>
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<tr>
<td>KOTA PASTORALISTS</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>-Two seasonal livestock centers</td>
<td></td>
<td>-Buffalo rearing</td>
<td>-Some sale of clarified butter</td>
</tr>
<tr>
<td>IRULAS</td>
<td>-Permanent hamlets</td>
<td>-Burial-memorial and worship centers</td>
<td>-Side-gabled houses</td>
<td>-Agriculture: multilayer, single layer, and kitchen gardens</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Hipped-roof memorial-temples</td>
<td></td>
<td>-dry field crop cultivation</td>
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<td></td>
<td></td>
<td>-Livestock rearing: chickens, goats, sheep, some cattle</td>
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<td></td>
<td></td>
<td>-Limited gathering: yams, fruits, honey</td>
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<td></td>
<td></td>
<td>-Limited hunting: small to large game, jungle fowl</td>
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<td></td>
<td></td>
<td>-Trading of homemade baskets, brooms, clarinetns, winnowing-fans, gathered honey</td>
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<td></td>
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<td></td>
<td></td>
<td>-Priests' fees</td>
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<td></td>
<td>-Income from work on plantations</td>
</tr>
<tr>
<td>KURUMBAS</td>
<td>-Hamlets, semi-nucleated communities,</td>
<td>-Burial-cremation, burial-cremation-</td>
<td>-Agriculture: similar to the Irulas'</td>
<td>-Livestock rearing: no cattle, but rearing of chickens, goats, sheep</td>
</tr>
<tr>
<td></td>
<td>and dispersed houses</td>
<td>memorial, memorial, and</td>
<td></td>
<td>-Limited gathering: similar to the Irulas'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>worship centers</td>
<td></td>
<td>-Limited hunting: similar to the Irulas'</td>
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<tr>
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<td></td>
<td></td>
<td>-Trading of homemade base flutes, drying baskets, bamboo vessels, gathered honey</td>
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<td>-Fees for serving as musicians, healers, magicians</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>-Income from work on plantations</td>
</tr>
</tbody>
</table>
they might instead form a refugee group whose ancestors moved away from the lowlands because of cultural pressures exerted by neighboring settlers. Thus, more culturally advanced Irulas might have introduced the Kurumbas to shifting slash-burn agriculture. But aside from conjectures regarding the prehistoric status of both ethnic groups, one historical fact is indicated: in the early 1800s influences exerted by a similar environment combined with contact and stimulus diffusion had led to some marked resemblances between Irula and Kurumba occupancy patterns.

1. The Irulas

Occupance pattern. After visiting the eastern Nilgiri slopes in 1800, Francis Buchanan (1870, 1: 462) wrote this description:

On the hills the Eriligaru [Irulas] have small villages. That which I visited contained seven or eight huts, with some pens for the goats; the whole built round a square, in which they burn a fire all night to keep away the tigers. The huts were very small, but tolerably neat, and constructed of Bamboos interwoven like basket-work, and plastered on the inside with clay. These people have abundance of poultry, a few goats, and in some villages a few cows, which are only used for giving milk, as the Eriligaru never use the plough. They possess the art of taking wild-fowl in nets, . . .; and sometimes they kill the tigers in spring traps, loaded with stones, and baited with a kid. Near their villages they have large gardens of plantain and lime trees, and they cultivate the neighbouring ground after the Cotucadu fashion, changing the fields every year. . . . Besides cultivating their gardens and fields, the Eriligaru gather wild Yame (Dioscoreae), and cut timber and Bamboos for the people of the low country. . . .

Certain facets of the past Irula occupancy pattern remain unchanged. Irulas continue to live in nucleated communities. Their houses are built on comparatively flat terrain, or on levels fashioned
by digging into slopes and piling up earth on the outward sides. Houses on flatter ground often surround courtyards on two or three sides, but houses built upon levels on steep slopes tend to be aligned into single rows. At Koppayur (Figure 14) and other Irula communities with house-rows, the headman's house is set at an angle to the others. A feature not mentioned by Buchanan is the confinement room where menstruating women and mothers undergoing a postnatal pollution period must stay. Temples are rare in Irula communities. When present, they are small structures of varying sizes built with the same materials as houses. Occasionally, a small house extension will serve as a shrine honoring Ranga or some Hindu deity. To keep panthers (Panthera pardus L.), tigers (Panthera tigris L.), and elephants away, fires may still be set on courtyards. However, courtyards serve mainly as work areas, flats to dry out agricultural produce, or arenas for dancing, merry-making, and ceremonial rites. As keepers of chickens, goats, and sheep, Irulas construct assorted livestock huts with floors usually on stilts. Large, especially-made baskets are sometimes placed at night over chickens at ground level. Keeping of cows for milk is the exception rather than the rule, and such cows spend their nights in huts with or without walls. Irula communities are also liable to have various storerooms, sheds, huts, and platforms used to store firewood, grain, and household objects. At Koppayur there is even a special hut for holding drums played during leisure hours. Water to supply domestic needs in most Irula hamlets is carried from nearby streams, but some Irulas living in house-rows constructed for them by outsiders use piped water. Some communities are close to roads, but others are
Figure 14. Irula occupancy forms
reached only by long narrow paths.

Outside Irula hamlets, either close or some distance away, there are burial-memorial centers with temples forming a memorial-temple type. Elsewhere there are a few worship centers, of which the shrine on top of Rangaswami Betta is the best known. Gardens are still conspicuous features around Irula communities (Plate VI, A). Besides multilayer gardens composed of former species mixed with those introduced by Europeans, there are also single layer and kitchen gardens (for agricultural classification, see Appendix A). Prohibition of shifting slash-burn agriculture has prevented Irulas from clearing land wherever they desire, but crops continue to be cultivated on dry fields near their communities. Livestock are grazed in sections with shrubby regenerate growth, or on nearby savannas. Although large forest tracts were cleared for plantations after the advent of Englishmen, there are remaining deciduous and subtropical evergreen forests where limited gathering, hunting, and trapping continue. As employment on nearby plantations increased, local trade with neighbors played a lesser role in the Irula economy.

Irula houses and memorial-temples. Although Irula houses vary in size and some are differently designed, many are variants of one type. Some houses are separated, but many are built next to each other (Plate VI, B and C). The common side-gabled house has a rectangular earthen base, a front porch, upright Y-forked posts supporting cross-poles, wattle and daub walls running between posts, and a thatched roof (Figure 14). Walls with split bamboos, sticks, or banana
stem strips woven onto embedded vertical poles are not always coated with mud. Sometimes, a final wall covering of vertical banana stem strips is held in position by horizontal braces lashed into position (Plate VI, D). A right doorway is made by lashing a horizontal pole onto two posts, and a door formed by woven split bamboos is tied to one doorpost. Some houses have a doorway in the left rear. Roof thatching is laid over split bamboos lashed onto rafters overlying the cross-poles. However, roofs may also be made with banana stem strips held in position by poles lashed on (Plate VI, E). Excluding the smallest dwellings, a house's interior is divided into two roughly equal sections by an earthen partition extending inward from the front wall. Next to the rear wall, a shallow earthen platform is constructed for household utensils. Over this platform and next to the central rear wall post, an earthen lamp stand is erected. An interior fireplace is built next to the left front wall. Lastly, there may be a storage platform above a high central earthen partition and the left end wall top. Changing cultural ways cause Irulas to live increasingly in non-traditional structures. The Madras State Government and plantation managements have started to furnish them with substantial row dwellings (Plate VII, A). Irula children now receive free board, lodging, and education while residing in boarding schools (Plate VII, B).

Irula burial-memorial centers located in groves of wild trees are commonly associated with planted pagoda trees (Plumeria acuminata Ait.). Memorial-temples are built amidst the small earthen burial mounds (Figure 14). The memorial-temple type is a rectangular structure
having an open front, a U-shaped brick wall surrounding the other three sides, and a thatched roof with short crest. Roof rafters extend over a ridgepole above two kingposts, ultimately supported by posts within the wall, and pole plates surmounting posts outside the wall. Overlapping rows of grass thatch are tied onto horizontal split bamboos lashed over the rafters (Plate VI, F). Within the memorial-temples, against back walls, there are shallow earthen altars where stream-worn memorial stones and occasional sculptured stones are lain.

**Gardens.** Harkness (1832: 90, 130) observed bananas, chilies, edible roots, jacks, limes, and oranges growing in gardens adjacent to Irula communities. After 1900 Thurston (1909, 2: 376-377) added only castor, curcubitaceous plants, maize, and pigeon peas to the list. Although Europeans had introduced new plants at an earlier date (Appendix B), Irulas may have adopted them slowly. They presently grow at least 54 species of plants in their gardens (Table II).

The following relationships between gardens and plants near Koppayur, in 1963, are representative of Irula garden agriculture. One multilayer garden has jack, banana, and coffee plants, while another has a mixture of jack, kapok, mango, mandarin orange, banana, and coffee plants. In the first-mentioned garden there is a grain storage hut which was surrounded with pomegranate and chili plants. Other small multilayer gardens had Italian millet, little millet, and amaranth, or sweet potatoes only, growing between young to mature banana fronds. Within all these gardens, and particularly where they border on courtyards or paths, there were scatterings of amaranth,
TABLE II

IRULA GARDEN PLANTS

**Fruit**

Banana (*Musa sapientum* L.)
*Cherimoyar (*Annona cherimola* Mill.)
Citron (*Citrus medica* L.)
*Guava (*Psidium guajava* L.)
*Grapefruit (*Citrus paradisi* Macf.)
Jack (*Artocarpus integrifolia* L.)
Lime (*Citrus aurantifolia* Swingle)
Loquat (*Eriobotrya japonica* Lindl.)
Mandarin orange (*Citrus reticulata* Blanco)
Mango (*Mangifera indica* L.)
*Papaya (*Carica papaya* L.)
*Passion fruit (*Passiflora edulis* Sims)
*Pineapple (*Ananas comosus* Merr.)
Pomegranate (*Punica granatum* L.)
Pummelo (*Citrus grandis* Osbeck.)
Tamarind (*Tamarindus indica* L.)
*Tree tomato (*Cyphomandra betacea* Miers)
Watermelon (*Citrullus vulgaris* Schrad.)

**Vegetables**

Bitter gourd (*Momordica charantia* L.)
Brinjal (*Solanum melongena* L.)
Cabbage (*Brassica oleracea* L. var *capitata* L.)
*Chow-chow (*Sechium edule* L.)
Cucumber (*Cucumis sativus* L.)
Gourd (*Lagenaria vulgaris* L.)
*Kidney bean (*Phaseolus vulgaris* L.)
Lablab bean (*Dolichos lablab* L.)
Pigeon pea (*Cajanus cajan* Millsp.)
*Pumpkin (*Cucurbita pepo* DC)
*Tomato (*Lycopersicum esculentum* Miller)

**Root**

Canna (*Canna indica* L.?)
Giant taro (*Alocasia indica* Schott.)
*Potato (*Solanum tuberosum* L.)
*Sweet potato (*Ipomea batatas* Lamk.)
*Tapioca (*Manihot utilissima* Pohl)
Turmeric (*Curcuma longa* L.)
Yam (*Dioscorea alata* L.)

*New World plants
TABLE II (continued)

Grain (middle three are the leading dry field plants)

*Amaranth (*Amaranthus caudatus* L., but mostly *A. hypochondriacus* L.)
Finger millet (*Eleusine corocana* Gaertn.)
Italian millet (*Setaria italica* Beauv.)
Little millet (*Panicum sumatrense* Roth & Schult)
*Maize (*Zea mays* L.)

Spice

Cardamon (*Elattaria cardamomum* Maton)
*Chili (*Capsicum frutescens* L.)
Curry-leaf tree (*Murraya koenigii* Spr.)
Mustard (*Brassica juncea* Hk. & T.)
Pepper (*Piper nigrum* L.)

Flower

Canna (unedible *Canna indica* L.?)
Chrysanthemum (*Chrysanthemum* sp.)
Marigold (*Tagetes patula* L.)
Rose (*Rosa* sp.)

Beverage

Coffee (*Coffea arabica* L., *C. canephora* Pierre)

Sweeting

Sugarcane (*Saccharum officinarum* L.)

Fiber

Kapok (*Ceiba pentandra* Gaertn.)

Oil

Castor (*Ricinus communis* L.)
brinjal, castor, edible and non-edible cannas, chili, kidney and lablab beans, papaya, rose, sugarcane, sweet potato, giant taro, and yam plants. Elsewhere, there are small single layer banana gardens. Kitchen gardens had plots with 1) amaranth (Amaranthus hypochondriacus L.), 2) mixed amaranth (same species), kidney beans, and maize, 3) alternating kidney beans and maize, 4) alternating kidney beans and potatoes, 5) lablab beans, 6) cabbages, 7) chilies, 8) maize, 9) pineapples, or 10) turmeric. Cabbages and potatoes are infrequently grown by Irulas. Presence of the two plants, combined with the fact that alternating kidney beans and potatoes were planted together in rows, indicate Badaga cultural influence.

Dibbles or crowbar substitutes, assorted hoes, hoe-forks, and knives are the implements used by Irulas in gardens (Figure 15). The gardens themselves vary greatly in structure. Some multilayer gardens have both horizontal and vertical conformity. Thus, a garden with scattered perennial jack, mandarin orange, and coffee plants will have three general growth layers all over. In contrast, other multilayer gardens have such a hodgepodge of annuals and perennials that horizontal and vertical uniformity will be non-existent. Small banana stands form the commonest single layer gardens. Kitchen gardens contain crops planted or sown after the first May mango showers and harvested mainly over the same period as field crops. Kitchen garden plants are usually planted in mounded rows, but species such as amaranth, maize, or turmeric may be grown over small patches.

Dry field agriculture. According to Harkness (1832: 93-94),
AGRICULTURAL IMPLEMENTS

Sickles

Weeding-hoes

Kurumba

Hand-fork

Hoe-forks

Digging-fork

L.l.

1 or 2

Hoes

Badaga

Irula

Wynaad

Badaga

Plows

Kota

Lowland

Irula

Yoke

Figure 15.
Irulas partially cleared the forest and turned up earth with hoes, or used dibbles to scratch the earth's surface into furrows. Grain was broadcast over the clearings, and no attention was given to a growing crop. If grain was planted at some distance from a community, families would move to their grain fields at harvest time. Family members ate grain from their field, but would also invite neighbors and passers-by to eat the grain. Grain to be eaten in one day was gathered according to the day's need. After parching on a heated flatstone, the grain was dehusked, rubbed into meal with aid of a smaller stone, mixed with water, and flattened out into flatcakes. These were then cooked over the reheated flatstone. However, if a stone with a depression was available, meal mixed with more water was made into porridge. When grain in a field cultivated by one family had been consumed, its members moved to a grain field cultivated by another family. Thus, grain in each field was eaten in turn until all grain raised by community members was finished. The fact that grain production was small to begin with, combined with crop sharing and no desire whatsoever to store grain for the future, resulted in rapid grain consumption. As there was only one harvest annually, community members then had to depend upon forest and garden products for their support. Ouchterlony (1848: 62) corroborated Harkness' description. He said that Irulas grew limited acreages of grain, ate field produce up immediately, made no effort to store grains, and then turned in the rainy season (easterly monsoon) to garden products. The cultivated grains were finger, Italian, and little millet, and mustard. In gardens, bananas, jack's, and other fruits were grown. When
Irulas became hard pressed for food, hunting and sale of beeswax to lowlanders became important. To the list of early crops may be added grain amaranth seen and collected in 1800 by Buchanan (1870, 1: 462). Early use of hoes in Irula dry field preparation was also observed by Keys (1812: xlix) and Hough (1829: 109). Irula shifting slash-burn agriculture continued until at least 1859 (Cleghorn 1861: 140).

The Final Land Settlement (1881-84) and Madras Forest Act (1882) officially ended the use of forested lands for agricultural purposes. Although Irulas may no longer cultivate crops wherever they desire, they own enough land to permit periodical shifting of grain plots. The shifts are necessitated by topsoil erosion on steep slopes and non-application of fertilizers. Terracing would slow down erosion, but Irulas do not terrace their fields. Plots may be cultivated for about three years before being left to wild plant growth. However, because individual landholdings have decreased in size as a result of land being inherited equally by sons, longer cultivation periods sometimes become a necessity.

Irulas now raise the same dry field plants as those cultivated by ancestors over a century ago. Italian and little millets are frequently sown together, but finger millet is grown separately. Because amaranth and mustard are mixed in with the three cereals, they grow as scattered plants over the grain fields (Plate VII, C). Excluding the sowing of seed by men, both adult sexes perform all the agricultural tasks. However, such monotonous tasks as weeding or reaping are often relegated to the women.

To obtain their annual crop, Irulas clear and prepare fields
by May. Ashes from plants burned after their removal are spread, and earth is tilled with hoes and hoe-forks. Seed is sown mainly in late April and early May, after the mango showers have fallen. However, if the showers have not brought enough rain, sowing may be postponed until June. Broadcast grain is worked into the earth with the aid of hoes and hoe-forks. Growing plants are weeded to varying degrees. Excepting little millet, grains are harvested mainly in August and September. An occasional finger millet crop sown after the first easterly monsoon rains is reaped in December and January, when late maturing little millet is also harvested. Irulas use very small sickles for removing most grain heads, but amaranth stems are cut off with knives. In the harvesting of amaranth and finger millet, plants are visited periodically to permit the removal of grain as it ripens. Stubble left on fields provides forage for livestock. Harvested Italian millet grain heads may be stored away until needed. Irulas use threshing sticks to thresh all their grain. When thoroughly sun-dried, grain is stored in large woven bamboo baskets and grain chests kept inside or on platforms within houses. For storage up to a year or more, maize cobs and beans from kitchen gardens, or grains—especially finger millet—from fields, may be placed in a clay pot. This then has its lid thoroughly sealed on with clay before being put away in a warm section within a dwelling.

Livestock. Irulas have kept chickens, cows, and goats since Buchanan's visit to them (see above quote). They now also rear sheep (Plate VII, D and E). Breeks (1873: 68) noted that Irulas did not
eat buffalo or cow flesh, which would be in keeping with their caste position in the last century. Besides being a food source, chickens and goats served as sacrificial animals. Harkness (1832: 88) witnessed Irulas sacrificing cocks and a goat by slitting their throats. Shortt (1868: 64) mentioned cock and goat sacrifices to Mari, Hindu goddess of small pox. Irulas now tend to give up blood sacrifice, but cocks and goats may still be sacrificed before grain sowing or harvest. Flesh of birds or animals so slaughtered is eaten. Presently, only a few cows are kept for milk, but chickens, goats, and sheep are commonly reared for meat. Irulas will not eat cow's flesh. Cows are annually honored on Martu Pongal day in January, after little millet is harvested. Nim (Azadirachta indica A. Juss.) leaves and aerva (Aerva javanica Juss.) flowers, emblematic of fertility and future prosperity, are placed on house roofs. The garlanded cows, with horns painted bright colors, eat banana-hands served on banana leaves.

**Gathering.** Wild yams formed the basic diet of some Irulas during a part of the year. Buchanan, in the passage already quoted, specifically mentioned wild yams. Harkness (1832: 94-95) said:

... Many of them live, for the remainder of the year, on a sort of yam, which here grows wild, and which, after the name of these people is called the Erular root. To the use of this root they accustom their children from infancy, and when it fails them, which is sometimes the case, they have hardly any resource from starvation. As it becomes scarce in the vicinity of their village, they wander through the forest in search of it. ... It is during this winter of their year, or while they are wandering about the forests in search of food, that, driven by hunger, the families or parties separate one from another, each eager only to satisfy his own cravings. ...
Irulas still collect yams, mainly during drier months from December through March. Dibbles or crowbars are used to dig up the long, winding roots. Top root portions are replanted to produce another natural crop a year hence. Wild yams found on the Anaimalais from 1,300 to 4,000 feet, which probably also grow on the Nilgiris, were identified as *Dioscorea bulbifera* L., *D. daemona* L., *D. oppositifolia* L., *D. pentaphylla* L., *D. p. var. wightii* Prain & Burk., and *D. tomentosa* Heyne (Fisher 1921: 180-181). Roots of three wild yam-like smilax plants, *Smilax aspera* L., *S. macrophylla* Roxb., and *S. wightii* A. D., are also said to be eaten.

Shortt (1868: 62) wrote that Irulas collected wild fruits, herbs, and roots to appease hunger, along with beeswax, drugs, dyes, gums, honey, and medicinal herbs. The gathered products were exchanged with lowlanders for clothes or food. While searching for honey, Irulas sometimes suffered severely from encounters with sloth bears (*Melursus ursinus* Shaw). Earlier, Keys (1812: 49) had stated that Irulas were expert in collecting honey from rocks and cliffs. After 1900 most forest produce collected by Irulas was being taken into special collection centers established by the Madras Forest Department. Lushington (1902: 147) listed the main gathered products as beeswax, deer antlers, gum, honey, avaram bark (*Cassia auriculata* L.), vembadan bark (*Vintilago maderaspatana* Gaertn.), myrobalan fruit (*Terminalia chebula* Retz.), tamarind fruit (*Tamarindus indica* L.), and soapnut (*Sapindus trifoliatus* C.). Myrobalan fruit for tanning was by far the most important item. With replacement of myrobalan fruit by acacia bark and synthetic tanning agents, gathering for the Forest Department has
become a minor economic activity. Most gathered products are now used by the Irulas themselves.

**Hunting.** To supplement their food supply further, Irulas once regularly hunted and caught game in snares or traps. Buchanan said they used nets to catch wild fowl and deadfalls weighed with stones to kill tigers (see above quote). Harkness (1832: 95) mentioned them ensnaring and hunting wild animals. Ouchterlony (1848: 62) listed muntjac, sambar, spotted deer (*Axis axis* Exrl.), and other game as being hunted with much skill. Use of bows and arrows by Irulas is not mentioned in the literature pertaining to hunting, so they apparently hunted with hunting nets and spears. Breeks (1873: Plate LXXVIII) obtained a photograph of a net and spear used mainly to catch and dispatch muntjacs. The spear had an iron head manufactured by Kotas. The same photograph shows a small net in which jungle fowl were caught. By the early 1900s Irulas had started using guns (Thurston 1909, 2: 373, 379). Due to strict game controls, Irulas generally no longer hunt big game. If they do, guns are used. Deadfalls, small nets, and snares are occasionally employed to entrap or kill animals and jungle fowl.

**Handicrafts and trade.** Some Irulas weave baskets, winnowers, and winnowing-fans of split bamboo. Banana stem strips are also employed in basketry. Leaves from the small *Phoenix humilis* Royle palm are made into brooms. A few men fashion clarinets out of bamboo, wild jack (*Artocarpus hirsuta* Lamk.) wood, and porcupine (*Hystrix leucura* Gray & Hard.) quills. These artifacts, along with some gathered
products, are bartered or sold to neighbors. The Irulas are especially known as suppliers of honey collected from the hives of forest and rock bees (Apis indica L. and A. dorsata L.). An example of bartering trade is offered by the Kinar Kotas and nearby Irulas. The Kotas obtained brooms, bamboo artifacts, honey, punk used by priests to light fires (priests may not use matches), and resin incense (Canarium strictum Roxb.) from Irulas. In return, the latter receive both field and garden implements from Kotas. Irulas living at lower elevations maintain economic relationships with lowlanders, and also frequent the Metupalaiyam or other lowland markets.

**Irulas as priests.** Irulas have for long served as priests to Nilgiri Ranga, mentioned by Keys (1812: xlix). According to Ouchterlony (1848: 62), Irula priests officiated on the top of Rangaswami Betta during the festival honoring this god in August-September. Hindu pilgrims flocked to the peak from all over the adjacent region to offer both money and produce to the god. In 1962 Ranga was honored at Rangaswami Betta on every Saturday for a month running from the middle of September. The garb of the officiating Irula priest (Plate VII, F) and the ritual he performed were typically Hindu. Devotees who came to worship were Irulas and members of other castes. Ritual performed by Irula priests and their assistants on Rangaswami Betta and elsewhere not only yields income for the men involved, but also tends to place all Irulas on a more respectable caste level with greater economic opportunities.

**Plantation work.** The first coffee plantation on the Nilgiris
was started in 1838, but by 1847 Irulas had started to work occasion-
ally as coolies on what must have been coffee plantations (Appendix
B). In their plantation work then, Ouchterlony (1848: 62) labelled
them as expert tree fellers and hewers of planks or rafters. By 1868
some had been considerably acculturated by working alongside imported
laborers on plantations (Shortt 1868: 63). After a post-1900 visit to
an Irula hamlet near a coffee plantation, Thurston (1909, 2: 376)
recorded that it was "in the possession of pariah dogs and nude child-
ren, the elder children and adults being away at work." Thurston
(1909, 2: 377) also refers to this statement made by a writer in the
early 1900s:

The Irulas, . . . , generally possess a small plot of
ground near their village, which they assiduously culti-
vate with grain, although they depend more upon the wages
earned by working on estates [plantations]. . . . The
Irula women are useful as the men in weeding, and all
estate work. In fact, planters find both men and women
far more industrious and reliable than Tamil coolies.

Today, the presence of Irula hamlets near eastern Nilgiri plantations
is explained by the fact that plantations were frequently established
in localities where Irulas could supply the demand for labor. Some
land the Irulas once used was eventually covered by plantation crops.
What was written by Thurston and an unknown writer in the early 1900s
is perhaps even more representative of present-day Irulas. Field
observation indicates that most Irulas of working age labor on planta-
tions. Irulas who own land and are employed use time apart from
wage-earning to care for their field crops or garden plants. In
field preparation, sowing, and harvest periods, plantation manage-
ments must compensate for a reduction in the labor force due to Irulas
working their own lands. After laboring for years on plantations, some Irulas purchase land with bonus money received from plantation manage-
ments.

2. The Kurumbas

Occupance patterns. Most Kurumbas discussed in this section live on steep outer Nilgiri slopes westward from the Mettupalaiyam-
Kotagiri ghat road to the Kundah River (Figures 1 and 2). However, there are also scatterings of Kurumbas in areas occupied by Irulas to the east and west.

During the 1800s Kurumbas lived in 1) caves or rockshelters, 2) dispersed dwellings near forest clearings, and 3) houses or huts in small hamlets. Birch (1838: 107) gave this description of cave-
dwelling Kurumbas:

... They are quite secluded from the rest of mankind, dwelling in holes and caverns in the sides of mountains, deriving a precarious and wretched subsistence from some ill-cultivated spots near their dens, from the animals which they may catch and destroy, and from presents re­ceived from the Todas and Burghers for assisting at their ceremonies.

Concerning dispersed Kurumba dwellings and economic pursuits, Morgan (1876: 99-100) said:

The slopes of the Neilgherries border the Coimbatore District from Soondaputty in the west to Guzzlehutty on the north. They are inhabited below the crest by Cooroombers and Irulas, the latter of whom live in small villages, but the former live more solitary lives, a couple frequently living alone, in the center of dense forest and cultivating a small patch of raggy [finger millet]. During the hot weather, the Cooroomers especially spend their time in digging out the wild yam, and in scaling the ladders and rattan ropes, for the hives of the great cliff-bee. They also obtain large quantities
of honey from the boles of ancient forest trees, there stored by a smaller species of bee. These men collect almost all forest produce, such as soapnuts, myrobolams, dye barks, etc., which they sell for a trifle to the plain traders whose debtors they are, in return for salt, grain, chillies and other necessaries . . . .

Almost all hill tribes [Irulas and Kurumbas included] are very clever in killing the smaller species of animals, such as the flying-squirrel, mouse-deer, etc. . . .

Evidence for Kurumbas living in small hamlets near dry fields and gardens comes from several sources. Harkness (1832: 128-130) visited a hamlet with a few huts constructed out of branches, leaves, and grass thatching. He noted that the Kurumbas grew bananas, chilies, edible roots, millets, and other small grains. Shortt (1868: 49) saw Kurumba families living in small multifamily house-rows 30 to 50 feet long, with each hamlet containing one house-row. Near or some distance away from dwellings there were small, poorly kept plots where cereals, chilies, maize, yams, and common vegetables (?) were grown. Banana, jack, mango, and other fruit trees grew semi-wild in the vicinity. Breeks (1873: 50, Plate XXVI) listed four or five houses as generally forming a hamlet, and mentioned patches cleared round about for sowing finger and Italian millet. His photograph shows a hamlet with haphazard arrangement of houses, scattered shade trees, and bananas amid grain nearby. Kurumba hamlets in the 1800s were apparently not associated with well-developed gardens like those found by Buchanan among the eastern Irulas. Ward (1821: lxxvi) and Cleghorn (1861: 140) identified the Kurumbas as shifting slash-burn agriculturists who used hoes to cultivate grains on steep slopes.

Thurston (1909, 4: illustration opposite 169) procured what may be the only photograph of Kurumbas living in a rockshelter. The
rockshelter was large in size, and the occupants had made no effort to erect a simple subsidiary dwelling or protective walls. Some rockshelters are said to have been occupied by Kurumbas into the 1940s, but they are now disused. Kurumbas continue to live in houses dispersed over slopes and in hamlets with a few houses, often arranged haphazardly. Dispersed houses are sometimes close enough to form semi-nucleated communities. In their hamlets, two or three dwellings may be aligned next to each other. Kurumba houses are built with similar materials, used in the same way, as those found in Irula houses (Plate VIII, B through E). However, among Kurumbas there is no typical house, so house plans vary greatly (Figure 16). Two further contrasts were noted by the writer during fieldwork: 1) because Kurumbas thatch their houses with less neatness, grass thatch tends to hang freely at the edges of roofs, and 2) Kurumbas may decorate their houses with doodlings on front or interior walls (Figure 16, Koliku-tai). Some Kurumbas are now living in long house-rows built by plantation managements or the Madras Government. Mortar, bricks, corrugated iron sheets, and tiles are used in the construction of house-rows. Confinement rooms, of the type found in Irula communities, are absent. Like all Nilgiri agriculturists, Kurumbas construct assorted temporary watch-huts in or next to fields (Plate VIII, F). The watch-huts are mainly occupied when grains riped. Relays of men, women, and children watching day and night scare animals or birds away. Temples are rarely erected in or near Kurumba hamlets. Those which do exist are small structures built in the same manner as most houses. Small, flat work areas border dwellings, but adjacent to longer house-rows
Figure 16. Kurumba dwellings at three hamlets
there are large courtyards.

Shortt (1868: 51) wrote that Kurumbas "sometimes offered sacrifices of fowls, sheep, goats," and Breeks (1873: 53) mentioned them sacrificing goats. Thus, in all likelihood, Kurumbas then reared livestock to some degree. Due to the threat of predators, only a few chickens, goats, and sheep are reared now for food or sacrifice. Livestock are kept at night in chicken baskets, coops, and small huts built next to dwellings, or in rooms next to rooms lived in by people (Figure 16, Kolikutai). No effort is made to keep livestock up off the ground at night.

Most Kurumbas, like Irulas, live some distance away from roads and walk to or from their houses via narrow paths. Similarly, Kurumbas still must fetch water for household use from nearby streams. Away from Kurumba houses, close or far, there are burial-cremation centers. Combined with or some distance away from these centers there are memorial centers where water-worn stones are laid in dolmens, or upon especially erected stone platforms. Rockshelters have occasionally been used for worship from the past to the present. Kurumbas also maintain small sacred clearings, sometimes associated with pagoda trees, in which there may be a shallow altar, some Shiva tridents, crude pottery images from the lowlands, and a large sacrificial knife.

As shifting slash-burn agriculture is no longer practiced, Kurumba agriculture is now similar to Irula field and garden agriculture. However, agricultural patterning around their hamlets or houses is unpredictable. For example, 1) Kurumbas may live on open land, with nearby scattered fields sometimes extending up to houses; 2) near
some occupancy sites there are scattered garden trees and banana clumps, but field crops dominate; 3) some hamlets or houses are surrounded by multilayer gardens providing shade, while field crops are grown on more distant plots; and 4) other occupancy sites have well developed kitchen gardens around them and field crops farther out (Plate IX; A, B, and C). Kurumba multilayer gardens are generally most numerous where Kurumbas live by plantations or near eastern Nilgiri Irula communities. Because Kurumbas dwell amidst the same remnant forest types as those associated with Irulas, they share the same range of gathering-hunting exploitative possibilities.

Agriculture. Shortt's description of Kurumba year-round activities around 1868 indicates that Irula and Kurumba occupancy patterns were then basically similar. Forest was roughly cleared by the Kurumbas, soil was broken, and grain was broadcast over the plots. These were usually near dwellings, but would sometimes be located some distance away. At harvest time families might take up temporary residence near more distant plots. As among the Irulas, grain grown on one family's cultivated land was consumed by family members and neighbors. Family members afterwards fed on grain from other fields until all grain grown by Kurumbas in an area was consumed. Kurumbas then turned to garden produce and in time of greater need gathered edible roots, fruits, and honey. They also hunted and trapped wild game. Men sometimes worked as laborers, and were especially skilled in felling trees, cutting wood, and squaring timber. Women visiting outside communities begged for refuse rice, rice water, and other food, or cleansed,
winnowed, and ground grain in return for food (Shortt 1868: 51).

Because Breeks (1873: 53) said that Kurumbas stored grain in large oval baskets and obtained a photograph showing such a basket, it is certain that some Kurumbas stored grain in Shortt's time. Both Harkness' and Shortt's statements concerning rapid grain consumption at harvest time are, therefore, suspect. However, even if families stored grain, the probability remains that both Irulas and Kurumbas subsisted for part of the year by eating garden produce, or food obtained through gathering or hunting activities and for services rendered to outsiders.

Kurumbas inherit land in the same manner as Irulas. Plants presently associated with Irula agriculture are also grown by Kurumbas. In addition, some Kurumbas living in house-rows above the Melur Slope now sow small amounts of barley (Hordeum sp.) or wheat (Triticum sp.), besides establishing single layer tea gardens under shade-giving silver oaks. There are no multistory gardens around this community, but in nearby kitchen gardens old crops are still grown.

Both field and garden plants receive the same treatment from Kurumbas as that which is bestowed upon them by Irulas. Times of planting, sowing, or harvesting, and use of related implements are thus similar. A few examples will serve to show the nature of Kurumba agriculture and its affinities with Irula agriculture. At Kavalkombe, adjacent to a plantation, there was in 1963 a multilayer garden with jacks, mandarin oranges, and coffee surrounding the courtyard with aligned dwellings. Scattered among these plants and growing close to the courtyard there were some cherimoya, grapefruit, guava, pomegranate, and tree tomato plants; a few tapioca shrubs grew closer to the
ground, and a fair number of yam vines climbed upward. A dense single
layer banana garden was located close to the main garden. Bordering
the main garden to one side was another multilayer garden with only
jacks and well-kept coffee shrubs. At Parthyalam, adjacent to another
plantation, there was in 1962 a multilayer garden with mixed banana,
canna (non-edible), cherimoya, jack, kapok, lantana (a weed), mandarin
orange, mango, papaya, and tapioca plants surrounding a house (Plate
IX, B). Near another single house there was a multilayer garden with
banana, coffee, and guava plants growing together. Mixed canna (non-
edible), castor, chili, jack, mango, papaya, and yam plants grew next
to a small group of five houses arranged haphazardly. Down the Melur
Slope (Plate IX, A), in 1963, there was one house surrounded by a
kitchen garden with small patches of amaranth, maize, and sweet pota-
toes (Plate IX, C), and another house surrounded by a kitchen garden
containing an unusual mixture of amaranth, finger millet (E. c. var.
stricta Roxb?), giant taro, sweet potatoes, and tapioca (Plate IX, D).
At Parthyalam in 1962 there was a large steep plot covered with dry
field crops ranging into a multilayer garden with amaranth, Italian
and little millet, mustard, tapioca, and bananas mixed wildly together
(Plate IX, E). Italian and little millet are usually mixed before
sowing, but finger millet is sown as a separate field crop (Plate
VIII, F; Plate IX, F). Scattered amaranth and mustard are often sown
with the grains. Like the Irulas, Kurumbas harvest late-growing little
millet after Italian millet grown in the same field.

Gathering. Morgan's description of Kurumba gathering activities,
quoted above, points out the close parallels between Irulas and Kurumbas in the 1800s. Thus, wild yams, honey, and forest produce ideal for exchange with lowlanders were also important to Kurumbas. The Madras Forest Department, which became the main distributing agent for forest products collected by Kurumbas, nowadays receives only minor amounts of gathered materials from them. Wild yams continue to be seasonally dug up in fair quantity, and forest materials are used in home construction or for fashioning domestic necessities and musical instruments.

**Hunting.** Concerning the killing of game by Kurumbas, Shortt (1868: 50) said:

... They are fond of the chase, and are expert in waylaying and destroying animals, either by nooses, nets, or rude constructions of stone gins. Thus they frequently live on the flesh of the Sambre, spotted deer, squirrel, wild cats, rats, snakes, &c. . . . .

In all likelihood Kurumbas had started using guns by 1876, for in that year Morgan, Deputy Conservator of Forests, declared that there were few villages in the Mettupalaiyam lowland region without at least 12 guns. The inhabitants of Nellithorai, next to the Nilgiri massif, supposedly owned 72 guns (Figure 1). Kurumbas living on adjacent slopes were in constant contact with the lowlanders, and would in all likelihood have obtained some guns from them. An interesting practice, probably followed by the Kurumbas as well, was the use of hunting nets in communal hunts carried out by inhabitants of the same region. Each village had ten to 30 nets, and people from as many as 12 villages used their nets in hunts covering miles of forest. In one such hunt,
70 or 80 men using 60 nets killed six sambars and 27 spotted deer in a single day (Morgan 1876: 101).

Morgan (1876: 100-101) outlined two methods used by Irulas, Kurumbas, and Sholigas in hunting (or gathering?) flying-squirrels (large brown *Petaurista philippensis* Elliot and small Travancore *Petinomys fuscocapillus* Jerdon), mouse-deers (Indian chevrotain, *Tragulus meminna* Erxleben), and other small game. Flying-squirrels are best sought in the day, when they sleep in holes within tree trunks. As one man climbs up to a hole containing a flying-squirrel, others groan and hiss loudly while beating nearby bushes. Vibrated sounds produced by a man climbing up a tree would normally cause the flying-squirrel to take flight, but sounds produced by men on the ground are terrifying enough to prevent it from leaving. Thus, the man climbing the tree will eventually be able to grab the flying-squirrel and twist its neck. In the dry hot season, when high savanna grasses around scattered trees are burned down, a few grassy patches escape being burned. Mouse-deers and other game take refuge in the remaining patches. While a strong wind is blowing, grass along the edge of a single patch is ignited. Flames race through the vegetation, and animals which flee are clubbed to death by men surrounding the burn. Those which manage to escape the men may be killed by dogs. After a burn has cooled sufficiently, men cross it to collect corpses of any animals caught in the flames. Morgan also mentioned fish gathered after being drugged with crushed strychnos (*Strychnos nux-vomica* L.) seeds thrown in water.

The writer could find no evidence, through field observation or
in the literature pertaining to hunting, for the use of bows and arrows by Kurumbas. This is remarkable, for they still use a bow-sprung trap clearly shown for the first time in one of Breeks' photographs (Breeks 1873: Plate LXXVIII). Furthermore, from sculptured evidence on Nilgiri dolmens there can be no doubt that users of bows and arrows once inhabited the upper Nilgiris. Breeks (1873: Plate XXIII) obtained a photograph showing a Kurumba male with spear plus bundled hunting net. During the 1800s there was probably widespread use of hunting nets and spears, small sprung nets, bow-sprung traps, deadfalls, and nooses. As the number of Kurumbas owning guns increased, nets may have been used with guns rather than spears. Eventually, hunting nets were outmoded. Thurston's photograph of a rockshelter also shows a Kurumba holding a long-barreled flintlock, and it seems probable that guns were the most frequently used hunting weapons by the start of this century (Thurston 1909, 4: illustration opposite 169). The 1879 Nilgiri Game and Fish Preservation Act established closed seasons for game animals, regulated hunting, and set penalties for violators. The best forests were reserved and protected by the 1882 Forest Act. Both acts forced a decline in the killing of game and made it difficult for Kurumbas to hunt. Nevertheless, Kurumbas continued hunting, even though they did so outside the law. Phythian-Adams (1929: 947, 950) noted that the most serious poaching on the Nilgiris was often carried out by armed Kurumba groups. During November, 1928, several Kurumbas from southern Nilgiri slopes killed off much of the game around Bison Swamp. With the apparent exception of hunting nets and spears, other methods used to kill game in the 1800s are still utilized. Poaching has not been
Handicrafts and trade. Kurumbas, as they doubtless did in the past, still provide Badagas, Kotas, or Todas with honey, and bamboo base flutes, large drying baskets, or assorted smaller baskets and vessels. In recent years governmental officials attempted to raise living standards by inducing Kurumbas to make and sell bamboo baskets or rattan furniture. The basket cooperative at Manjakombe flourished for a short time. Besides tea plucking baskets, its members produced basketry rings used to surround and protect young tea bushes. The Burliar production center for baskets and furniture was also short-lived. Adequate, certain cash income offered by work on nearby plantations, combined with an aversion against the confining nature of basket or furniture production, probably caused the two ventures to fail.

Services. When Markham visited the Nilgiris in 1860, Kurumbas served as musicians to Badagas and Todas (Markham 1862: 368). Shortt (1868: 51) stated that they were "employed as musicians by the Toda and Badaga tribals on all ceremonial and festive occasions; . . . ." Breeks (1873: 50) said that Kurumbas normally attended all Toda funerals to "add their quota to the instrumental part of the performance." He identified their musical instruments as the same as those used by Kotas, except for the large horn. Rivers (1906: 641-642) found no evidence of Kurumbas playing music at Toda funerals, so by that time they must have stopped the practice. Now that Badagas will not employ Kotas to play music, Kurumba musicians are frequently called upon.
Thus, during the Mari festival in April, 1963, Kurumba musicians played for two days at the Badaga villages of Hulada and Ketti. On both days, with instruments similar to those used in the 1800s, they provided music for intermittent public dancing on greens near two Mari temples.

Due to their supposed control over supernatural powers, Kurumbas have for long been feared and even killed in reprisal for witchcraft. As a result of suspected witchcraft, 48 Kurumbas were massacred in 1835 (Thurston 1909, 4: 171). When, in 1900, Badagas were convinced that a Kurumba family head had brought death and disease to one of their villages, they obtained the aid of Todas and murdered the whole family (Francis 1908: 120). Although ascribed powers over the supernatural have sometimes been detrimental, Kurumbas have also benefited by 1) utilizing them to obtain food in time of need, 2) earning income as doctors aided by the supernatural, and 3) obtaining money or barter through performance of magic ritual which is believed to ensure the well-being of Badaga crops. Muzzy (1844: 366) and King (1870-71: 45) said that Kurumbas managed to extract grain from their neighbors through fear engendered by their magical powers. According to Harkness (1832: 130-131), when Badagas or lowlanders were sick and believed themselves bewitched, they would go to Kurumbas who, besides their magical powers, knew how to use herbs and medicinal roots to advantage. Shortt (1868: 51) noted that Kurumba doctors were called to treat Badagas, their cattle, or diseased field crops. According to Ward (1821: lxxvi), Metz (1864: 116), Shortt (1868: 50), and Breeks (1873: 54), Badagas would never sow their fields or harvest crops before a Kurumba sorcerer
performed appropriate ritual. Because of the continued fears and beliefs of their neighbours, Kurumba healers and magicians are still in demand. Old devices, knowledge of herbs, and ritual have not been abandoned.

**Plantation work.** During his 1860 visit to the Nilgiris, Markham (1862: 376) found Kurumbas working on coffee plantations in the berry-picking season. Shortt (1868: 53) came across a few Kurumbas working regularly as weeders and coffee bush pruners on coffee plantations near Kotagiri. Breeks (1873: 50) stated that in "late years many of them have taken work on adjoining coffee plantations." As tea acreages also increased, more Kurumbas went to work on tea plantations. Nowadays, many Kurumbas—if not the majority—work on coffee or tea plantations. On a few plantations there are houses for Kurumba laborers and their families. Others live next to plantations, or climb up daily from their dwellings on steep slopes at lower elevations. Thus, some Kurumbas, like the Irulas, really live in two cultural worlds. They work in the daytime on large plantations resulting from Western capitalism, but spend their nights and free time in environmental settings containing many elements of their past culture.
BADAGAS AND KOTAS OF THE UPPER NILGIRIS

Kotas may once have served as artisans to ancient Nilgiri members of the Megalithic Cult. Racial and linguistic evidence indicates that they were living on the Nilgiris before the Badagas arrived. Furthermore, Kotas maintain that Badagas ascended the Nilgiris after them and received aid from Kotas when they came. Thus, at first there may have been economic ties between lower ranked Kota agricultural artisans and pastoral Todas. After the Hindu and caste-affiliated Saivite Badagas settled on the Nilgiris, they probably exerted a steering effect on the development of caste-like relationships among the different Nilgiri ethnic groups.

Although the five Nilgiri ethnic groups have remained culturally distinctive, each must have influenced the others to varying degrees through diffusion of ideas. As a probable result, members of all three upper Nilgiri groups and the Irulas live in nucleated communities, and Kurumbas and Wynaad Badagas tend to do so. To varying degrees, members of all five groups build their dwellings in rows. When the functional arrangement of features within Toda, Kota, and Badaga dwellings are compared, the similarities are too great to preclude exchange of ideas. Because of combined temperate environmental and similar cultural influences, Badaga and Kota occupancy patterns were in many ways similar during the early 1800s. They practiced shifting slash-burn agriculture, used plows, subsisted on millets
and other cereals, and probably from their kitchen gardens obtained most produce which was bartered or sold. In the later part of the last century shifting slash-burn agriculture was legally abolished. During this century the Badagas and Kotas abandoned the use of plows and turned to commercial potato production. Economic differentiation between the two groups is based mainly on the fact that Kotas have been partially supported by basketry, blacksmithing, carpentry, hide curing, pot making, and the playing of music. These supplementary activities of the Kotas, practiced to varying degrees by other Indian groups, are commonly associated with low social ranking.

1. The Badagas

**Occupance pattern.** Most Badaga hamlets and villages are located above 6,000 feet and east of the grasslands inhabited mainly by Todas (Figure 2). Harkness' description of Nanjanad before 1832 indicates that the basic Badaga occupance pattern remains unchanged. There was cultivated land around the village, and cattle grazed on nearby grasslands. Houses aligned horizontally into two house-rows on a hill side had joined front porches facing the down slope. A flat courtyard before each house-row was used to hand-thresh and dry grain in the sun. Both courtyards were edged on the outside by low stone walls. At one end of the village there was a compacted circle on which cattle trod out grain, and at the other end there were several cattle enclosures (Harkness 1832: 36-37). Badaga farmers continue to live together in communities, and they cultivate nearby kitchen gardens plus near to distant dry fields (Plate X, A). Coffee, tea, and multilayer gardens
with mixed plants are also maintained, but these gardens may be miles away from their owners' houses and on outer Nilgiri slopes. Because land is divided equally among sons upon a father's death, extensive land fragmentation has taken place. To prevent further fragmentation, there is now a tendency for sons to share and jointly manage land. Communal pastures are close enough to permit the keeping of livestock in communities. Individually owned and communal plots covered with acacia, eucalyptus, and temperate fruit trees now occur near Badaga communities. Due to intensive or slowly continued temperate forest clearance, only a few small remnant patches of natural forest remain on the slopes near many hamlets and villages.

The outstanding features of Badaga hamlets and villages are the house-rows with compacted earth courtyards edged by low walls (Figure 17). House rows within a single community usually parallel each other and are frequently aligned in an easterly-westerly direction, but on flatter terrain they may surround a courtyard on two sides. Because the Badagas consider it sinful to throw waste water toward the sun, Lord Shiva's emblem, through alignment of houses in an easterly-westerly direction housewives may throw waste water through the back door or over the front courtyard wall without throwing it toward the sun. One dwelling within a community house-row is set apart as a confinement place for menstruating women or women undergoing a postnatal pollution period. In addition to dwellings, house-like temples are built into house-rows. Grain is threshed and agricultural produce or firewood is dried on the courtyards. These also serve as playgrounds for children, as sites for performance of ceremonial rites, and as dance arenas.
The Hethai temple plus houses A and B are shown in larger scale on another plate.

Numbers represent land belonging to 22 owners.

Figure 17. A portion of a Badaga village
during festive occasions. Badaga women frequently, sometimes daily, wash over sections fronting their houses with cowdung solution to keep the courtyards flattened out and cleansed. Low earthen or stone walls edging courtyards define property limits and add to the privacy of house inhabitants living within house-rows immediately below. Badaga women sometimes store firewood or keep flower gardens on the wall tops, but they are usually grass covered.

Separate shrines and temples stand in communities or on grassy plots outside. Some Badagas own storage huts where agricultural implements, fertilizer, seed-potatoes, and agricultural produce are stored. Small coffee, tea, and supply shops are increasing in number within Badaga villages. Hot beverages, as well as hotmeats, sweetmeats, rice, and curry, are served in the coffee and tea shops. From supply shops are obtained cigarettes, matches, grains, pulses, and vegetables. Areca nut, betel leaf, lime, and perhaps tobacco, which are combined and chewed, are also sold. Blacksmiths, building and supply contractors, carpenters, jewellers, and other entrepreneurs have established businesses in Badaga villages. A single government office, or combination of offices such as panchayat, police, post, and telegraph offices may also be present. Church or government schools are now located in or near many communities.

Hamlets and villages still have circular cattle-pens built in natural depressions or enclosed with stone walls, but cattle-hut construction is slowly leading to abandonment of the pens. Goats and sheep are kept at night on raised platforms within goat- and sheep-huts. Monetary inducements offered by the Madras Government have
caused some rearers of livestock to start keeping compost pits. In each hamlet or village there is usually a grassy clearing or raised platform where male representatives meet and Badagas gather to chit-chat. A large tree (often a Ficus sp.) may shade this meeting place. Some Badaga women still must fetch water from nearby springs or streams, but many Badaga hamlets and villages now have water piped to faucets set near house-rows. A burial-cremation center is within easy walking distance from each Badaga community. Most Badaga communities have roads running to or through them, and a fair number of these roads are asphalted. Scheduled buses run over some roads, and a few Badagas now drive individually or jointly owned cars, buses, station wagons, and trucks.

Houses. Prior to 1840 the Badagas lived in a house type with front porches and two rooms separated by a wall with a door. A small front door led into one room, and there was a fireplace in the other darker room. Thatched roofs were supported by posts, and walls made with bamboos or reeds woven between the posts were then daubed. However, some houses had clay and stone walls (Harkness 1832: 36; Birch 1838: 103; Hough 1829: 89). According to data obtained by Jagor (1876: 193-194), each thatched clay and stone house in an examined house-row had an entranceway leading on the right to a front room. This room had a right side storage platform and a mortar built into the floor on the left. From the front room a door led to a bathroom extending the full width of the house, and another door led to a kitchen paralleling the front room. The fireplace for cooking was
located across from the latter door. At the right of each entranceway there was a low porch and to the left a low porch and small stall, or a stall only. Buffalo calves were sheltered in each stall. The entranceway and features to right or left of it were protected by the single side-gabled roof covering all houses within the row.

By 1870 some houses were whitewashed; by 1880 whitewashing was a more widespread practice and house roofs were being tiled; by 1895 sleeping platforms made from broad and thick planks were replacing interior storage platforms; and by 1935 most Badaga houses had brick or stone walls, tiled roofs, and sleeping platforms (Shortt 1868: 58; Grigg et al. 1880: 225; Sastri 1892: 757; Ranga 1934: 5). However, despite these and other changes, the Badaga house type as described by Jagor and others remains essentially the same (Figure 18). Most houses now have whitewashed brick walls, and roofs are commonly made with sawn timbers, corrugated iron sheets, and tiles. Front entranceways may be located to the right or left. If there is a right entranceway, a sleeping platform replacing the storage platform mentioned by Jagor will be against the right wall of the front room. A mortar in the floor and rotary quern (usually present) will be near the wall on the opposite side, and all other features within the house will be arranged accordingly. If there is a left entranceway, a sleeping platform will be against the left wall, mortar and rotary quern will be near the wall on the opposite side, and all other interior features will accordingly be reversed from left to right. The room for bathing (himbara) no longer runs all the way across the back, but is located behind the front room (ithamanai). The open doorway
Figure 18. Badaga house (A), Badaga temple, and a Thoraiya house (B)
between the front room and kitchen (ogamanai) is typically arched. Over the kitchen fireplace, opposite the door, there is usually a flat woven bamboo and cowdunged drying basket measuring three or more feet across. This is especially useful for drying grains during monsoons. Near the front kitchen wall there may be a sacred hagotu for milk storage and processing, but many houses no longer have this feature. If a hagotu is absent, the front portion of the kitchen is still considered sacred and for men only. An upper storage platform (atlu) usually covers all or a portion of the kitchen. This and small upper storage platforms covering portions of the front room are reached by a ladder which is sometimes set permanently into the central wall with arched door. As in Jagor's time, there is usually a porch to one side of the entranceway. The calf stall on the other side is now replaced by a porch, guest room with or without a fireplace, or a storeroom. Thus, if there is a right entranceway, there will be a porch to the right, and one of the above-mentioned features will replace the stall to the left. This relationship is exactly reversed when there is a left entranceway.

The traditional house type may be modified. Poorer families, or individuals sharing the inherited parental home, may dwell within half-houses formed by sealing in the arched doorway of the central partition. Two arched doorways are then built into two walls constructed about three-fifths the interior distance back from the front wall. The small back rooms will serve as kitchens (Figure 17). Sometimes the basic floor plan is maintained, but the house is so enlarged that its front and back walls no longer are aligned with walls
of other houses in the house-row. The front porch area is often converted into an airy room. As a mark of prestige, a few Badagas have erected double-storied houses. The first floors in such buildings may have a floor plan similar to the one found in the traditional house type, but the second floors have mixed rooms arranged in no set pattern. Most of these houses were built during and after World War II, and construction dates are often conspicuously displayed on their fronts. An enlarging minority of Badagas now live in houses which bear no resemblance to the traditional house type. Their houses follow no particular plan and, therefore, represent an odd medley of house forms.

**Temples.** Breeks (1873: Plate LXXV) obtained a photograph showing the old Melur temple, and this is apparently the only record of a circular Badaga temple. Its basal portion had spaced posts standing upright around two or more varying circles with identical center. Sides were not walled and the roof, resembling an old-fashioned beehive, was thatched. Temples forming a Badaga temple type, not described in the literature concerning Badagas, are constructed in house-rows. They sometimes share a common wall with a house or storeroom, but separate temples aligned with houses in a row also exist (Figure 17). Row-temples are constructed with materials now employed in house construction and look rather like houses, but frequent presence of roof superstructures decorated with bulls and deity images automatically sets them apart (Plate X, B). Their design closely parallels the plan used in traditional houses. Porches flank
the entranceway. If a storeroom is built on a porch, it will be right of a left entranceway or left of a right entranceway. As in houses, arrangement of interior features is dependent upon a left or right entranceway. If there is a left entranceway, a sleeping platform will be built against the left wall in the front room (Figure 18). This room frequently has a back door, and the open doorway leading from front room to kitchen is arched. The kitchen fireplace, located opposite the door, is used for cooking food to be offered to the deity and then given to worshipers. A sacred room, entered through an arched doorway identical to doorways separating front and kitchen rooms in houses and temples, replaces the hagotu found in houses. Within the sacred room the deity's image is placed upon a shelf to the right. Besides other minor storage platforms, there is usually a storage platform covering the sacred room. Unlike houses, a temple does not have a bathroom.

Badagas also build temples which are variants of a small Hindu temple type constructed all over India. Although these vary in size and shape, they contain certain basic features. The deity's image is housed in a small, dark inner sanctuary surrounded by brick walls and often surmounted by an ornate cupola. Images of animals, goddesses, gods, and saints constructed from terra cotta or rod metal covered by mortar, then painted over with many bright colors, often cover a cupola. Attached to the deity's room there may be one or two rooms, but sometimes there is an open-sided shed with compacted earth or cemented floor, pillars of stone or wood, and a roof covered by corrugated iron sheets or tiles. In front of any Shiva temple there is
likely to be a tall stone shaft called a mahalinga, which is another emblem of Lord Shiva. Near or within the inner sanctuary, and adjacent to the mahalinga, there may be carved stone bulls (Nanthis) representing Lord Shiva's vehicle.

Thoraiyas and Badagas. Harkness (1832: 109) stated that the Thoraiyas, "a lower class of people who had principally gained their livelihood by weaving a kind of sackcloth," came to the Nilgiris after the first Badagas. When Harkness traveled over the upper Nilgiris he apparently noticed a few Thoraiya families residing in hamlets where Badagas or other caste people dwelt, but he also mentioned a Thoraiya hamlet. The Thoraiyas, who were generally the poorest inhabitants, used the distaff and spinning wheel (Harkness 1832: 112). Thus, they probably continued to weave cloth.

Thoraiyas presently inhabit a few of their own hamlets, but many live in hamlets or villages occupied by Badagas and other caste people. Because of their lower caste standing, they are separated from higher caste members by space, a wall, or both (Figure 17). Their houses are similar to Badaga houses, but proportionately more Thoraiyas live in half-houses (Figure 18). Thoraiya temples are also like Badaga temples. Some Thoraiyas cultivate their own land, but others earn all their income by laboring for others. Because of the abundance of mass-produced cloth, they no longer weave cloth.

In all likelihood Thoraiyas labored for the Badagas from a long time prior to Harkness' visit. Traditional relationships between Badaga master families and Thoraiya servant families cause some
Thoraiyas to virtually remain serfs, despite outside job opportunities. Female and male Thoraiyas continue to work on Badaga landholdings and serve in Badaga homes. Thoraiya males trained, for example, to be barbers, blacksmiths, brickmakers, carpenters, or washermen, have further served the Badagas. For their services, Thoraiyas are paid in cash and in kind. At periodic intervals and upon special occasions, such as Thoraiya weddings, presents are imparted by Badaga masters.

**Plants exploited by the Badagas.** A representative list of plants grown by the Badagas in the early 1800s is obtained from the writings of Keys and Harkness (Table III). Millet species were apparently the main subsistence cereals, but it is worth noting that barley and wheat were also raised. Plants grown commercially at that time were fenugreek (*Trigonella foenum-graecum* L.), garlic, mustard, and poppies (Harkness 1832: 138). Poppy juice, the source of salable opium, was extracted by women and children. Iron nails were used to scratch poppy capsules in the evenings, and gummy exudations were collected on following mornings. Capsules thus scratched every four days eventually died. Opium slowly obtained in this fashion was eaten and not smoked. Seeds collected from dead capsules were sold after sun-drying, and by boiling remaining capsule shells in water a stupefying beverage was obtained (Francis 1908: 290-291; Metz 1864: 153; Ward 1821: lxiii). According to Metz (1864: 153), fenugreek was sold to low country merchants; men from Coimbatore bought large quantities of garlic and onions, which were carried down to the plains on bullocks; and mustard seed sale alone was said by the Badagas
### TABLE III

**PLANTS GROWN ON THE UPPER NILGIRIS PRIOR TO 1836**

#### Cultivated Plants Listed By Keys (1812: 11)

- Black peas (*Phaseolus mungo* Roxb.?)
- Garlic (*Allium sativum* L.)
- Gaunj (*Hordeum* sp.)
- Mustard (*Brassica juncea* Hk. & T.)
- Poppy (*Papaver somniferum* L.)
- Shaume (*Panicum sumatrense* Roth & Schult) - two varieties
- Ventheum (*Trigonella foenum-graecum* L.)
- Wheat (*Triticum* sp.)

#### Harkness' List of Plants Grown By Badagas (1832: 136-137)

- Barley (*Hordeum* sp.)
- Garlic
- Gourd (*Lagenaria* sp.)
- Kirie (*Amaranthus* sp.)
- Koralee (probably a variety of *Setaria italica* Beauv.)
- Mochhie (*Dolichos lablab* L.)
- Mustard
- Onion (*Allium cepa* L.)
- Poppy
- Pumpkin (*Cucurbita pepo* L.)
- Rhahi (*Eleusine coracana* Gaertn.)
- Shamie (*Panicum sumatrense* Roth & Schult)
- Shanaugge (*Ervum lens* L.)
- Tennie (*Setaria italica* Beauv.)
- Vatta kadolie (*Cicer arietinum* L.)
- Varaku (*Paspalam scrobiculatum* L.)
- Vendey (*Trigonella foenum-graecum* L.)
- Wheat

#### Plants Introduced By The English (Baikie 1834: 35-36; Jervis 1834: 46; Mignon 1834: 83; Price 1908: 122; Hutchins 1883: 1; United Planters Association of Southern India 1960: xxxiii)

<table>
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<tr>
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<td>Blue gum</td>
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<tr>
<td>Kidney bean</td>
<td>Radish</td>
<td>Strawberry</td>
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to pay the government tax (presumably land revenue). Badagas slowly adopted "English" vegetables, the term commonly applied to vegetables introduced by the English (Table III). By 1865 the Badagas were growing potatoes, which were to become their main commercial crop (Markham 1862: 367; Metz 1864: 153-154).

Major changes in crop emphasis from the late 1800s to the present are best revealed by statistics resulting mainly from Badaga cultivation. In 1875 there were 15,728 acres of Italian millet, 4,662 acres of little millet, 3,761 acres of barley, 3,430 acres of finger millet, 3,199 acres of wheat, only 754 acres of potatoes, 355 acres of mustard, 169 acres of vegetables, 144 acres of fenugreek, 67 acres of horse gram (*Dolichos biflorus* L.), and 66 acres of poppies grown on the Nilgiris (Grigg et al. 1880: xii). In 1895 Italian millet was still the leading crop, but potato acreage had risen to 2,032 acres. Poppies outlawed by the 1878 Opium Act were no longer grown (Benson 1895: 432-433). Little millet had become the most cultivated cereal in 1905, and finger millet was growing in importance (Francis 1908: 164). Demands for potatoes during World War I helped to convert Badaga agriculture from a subsistence stage with some commercial crop production to a commercial farming stage. In 1914 there were about 4,000 acres with potatoes on the Nilgiris, but by 1920 potato acreage had doubled (Rao and Azariah 1953: 69). Before 1925 finger and little millets became the two important cereal crops, and remained the leading cereals from that time (Wood 1927: 210-223). Potato acreage has continually increased: by 1938 there were 12,000 acres, by 1950 almost 17,000 acres, and in 1960-61 there was a total
of 20,600 acres in the main season and 2,400 acres in the lesser (Rao and Azariah 1953: 69; Krishnamurthi 1953: 193; Madras Department of Agriculture 1960-61: single page). The production of the 1960-61 potato crop was approximately 61,900 tons and 7,060 tons. Most potatoes are shipped to Bombay, Calcutta, Madras, and other parts of India via Mettupalaiyam city at the base of the Nilgiris (Figure 1).

Despite increased potato production on dry fields and the eating of imported rice by Badagas, most early 1800 cereals continue to be cultivated on dry fields. Cereals raised mainly for home consumption also enter local markets. Produce from old commercial plants, excluding poppies, is still sold locally and on the plains. These plants are grown with "English" vegetables in kitchen gardens. Apart from potatoes, other "English" vegetables (Table III)—cabbages and carrots for example—are sometimes raised as dry field crops. Fruit trees originating from nectarine, peach, and plum plants introduced before 1836 (Table III) and Chinese pears introduced in 1846 (Price 1908: 125) are grown in Badaga orchards. Mandarin oranges grown in multilayer gardens are also of some commercial importance. Badagas have taken advantage of ready markets for fruit and "English" vegetables. Since completion of the railroad to Ootacamund in 1908, European and Indian families scattered over India have purchased, through agents, baskets of fruit and "English" vegetables sent out at periodic intervals from the Nilgiris. On market days produce from Badaga landholdings is displayed and sold in the Coonoor, Kotagiri, Ootacamund, and smaller markets. A few Badagas use their kitchen gardens to grow introduced berries (Table III), and strawberries in
particular are sold by vendors who wait near entrances into the main stores in Coonoor, Kotagiri, and Ootacamund.

Long after the introduction of tea before 1836 (Table III) and coffee in 1838 (Athrey 1953: 11), enterprising Badagas turned to coffee and tea planting. Ranga (1934: 19-21) recorded these facts concerning their earlier tea planting: During a single week in 1928 a European planter purchased 17,000 pounds of green tea leaf from Badagas. Between 1928 and 1930 Badagas in four communities increased their tea acreages to approximately 400 acres. By 1934 a Badaga woman managed a tea nursery, and a Kotagiri tea planter was purchasing all the tea leaf he could obtain from Badagas. In the 1960 Planting Directory over 100 Badagas are listed as coffee and tea growers. Their holdings range in size from six acres of tea to a tea garden with 190 acres of tea and a factory or from 15 acres of coffee to a garden with 158 acres of arabica coffee and 59 acres of tea (United Planters Association of Southern India 1960: 38-81). According to the tentative definition of a plantation used in this study (Appendix A), the two largest gardens would qualify as plantations—and are the only listed Badaga holdings with such large dimensions. Tea leaf from many listed and a much larger number of smaller unlisted holdings is processed in nearby company factories, or in small factories owned by Badagas or Lingayats.

Acacia and eucalyptus trees were first grown on the Nilgiris before 1836 (Table III). Badagas have since planted many acacias and eucalypti on land in and between their communities. From these trees are obtained acacia bark for tannin, eucalyptus oil, and firewood.
Gardens. Multilayer gardens owned by a few Badagas are mostly located in valleys below 6,000 feet and on outer Nilgiri slopes. They are usually some distance away from Badaga hamlets or villages. Coffee is frequently grown with jack, lime, and mandarin orange trees, but a few other plants grown in Irula and Kurumba multilayer gardens may also be raised. Badaga single layer coffee gardens occur in localities similar to those with multilayer gardens, but their single layer tea gardens are now scattered over the entire region utilized by upper Nilgiri Badagas. The tea gardens near to or far from communities may now be considered a typical part of the Badaga occupancy pattern. But even more typical are the kitchen gardens which surround most Badaga hamlets and villages.

Kitchen garden plots are usually protected by ditches, barbed wire fences, horizontal pole fences, piled brushwood, piled earth walls, piled stone walls, or planted shrub rows (Yucca sp., for example). Plots are usually small, a wide variety of plants are grown, seed may be sown or planted, tubers are planted, and intercropping is common. The agricultural cycle controlling planting, sowing, and harvesting in kitchen gardens generally corresponds with the dry fields agricultural cycle. Thus, plants are grown in kitchen gardens during a main agricultural season (karbokam) and a lesser agricultural season (kadaibokam). The varying personalities of cultivators are reflected in the different crops and crop combinations occurring in plots (Figures 19 and 20). Alternate planting of kidney beans (Phaseolus vulgaris L.) and potatoes on paralleled ridges is a popular practice. Frequently, paralleled but more widely separated intersecting cross-
Figure 19. Plots cultivated in the main season
Figure 20. The same plots cultivated in the lesser season
ridges constructed in the same plots are planted with broad beans
(*Vicia faba* L.) or peas. Kitchen gardens are typically better manured
and cared for. Because they are nearer to community cattle-pens and
livestock huts, more manure is likely to be placed on them. Due to
the absence of toilets in houses, community dwellers naturally defecate
more frequently on nearby plots. And lastly, women recurrently spread
kitchen ashes or trash over kitchen gardens. When family members have
time to spare, they may easily care for kitchen garden plots near the
communities in which they live. Women work on them between their
household duties, and men who are regularly employed work on them
during off duty hours.

**Shifting agriculture.** In 1800 the Badagas were practicing shift-
ing slash-burn (*kottukadu*) agriculture (Buchanan 1870, 1: 462). As
later writers described Badaga hamlets and villages in terms of perma-
nence, it is conjectured that Badagas then dwelt in permanent communi-
ties and cultivated different plots on the nearby countryside from year
to year. From the time Englishmen started to administer the Nilgiris
until the late 1800s, the *bhurty* revenue system existed over the upper
Nilgiris. Under this system a farmer could hold up to ten times the
taxed land he actually cultivated in any single year. Therefore, a man
who paid taxes on five acres could hold nine other five-acre plots
scattered over the upper Nilgiris. Plot alternation accompanied by the
necessary clearance of vegetation off fallowed land not cultivated for
years, or off newly claimed forest land, formed a system of shifting
agriculture. Another system was followed in the western Kundahs, which
were transferred from Malabar to the Nilgiri District in 1860. After a farmer paid a tax ranging from one to one rupee and eight annas per plow, or four to eight annas per hoe (erku kadu kottukadu revenue system), he could cultivate as much land as he desired to in any chosen locality. Forest lands were not excluded. Consequently, cultivated plots were constantly being abandoned for new ones opened up or recleared. The two land revenue systems resulting in shifting agriculture were formally abolished in 1863, but in actual practice they lingered on until about 1884 (Francis 1908: 268-270).

In 1863 the English instituted a system of taxation whereby farmers were expected to pay taxes on all claimed lands, but inaccurate knowledge concerning claimed lands and actual agricultural practices led to continuance of old ways. As a result of the Final Land Settlement of 1881-84, all claimed lands were mapped and accurately recorded for taxation purposes. Each individual was given a title (patta) to his land, but from thenceforth was expected to pay land revenue based on land extent and quality (Francis 1908: 274-278). During post-1884 years remnants of old practices remained. Although Badagas paid revenue according to the lands owned by them, an individual's scattered plots away from a community might be cultivated periodically during the years, or left vacant for years until the owner decided to place more land under cultivation. Plots close to a community, especially those used for kitchen gardens, were usually cultivated at least once a year (Ranga 1934: 13-16). Nowadays, however, 1) fertilizer application, 2) cash obtained through potato sales, 3) the spreading desire to plant more tea, and 4) decreasing opportunities for individuals to
purchase cultivable land near Badaga communities have lowered the possibilities of land away from a community remaining uncultivated from year to year.

The agricultural cycle. Harkness (1832: 136-137) gave details concerning two yearly agricultural seasons, each of which coincided with westerly or easterly monsoons. Italian, koda (Paspalum scrobiculatum L.), little, and finger millet, amaranth, barley, wheat, garlic, onions, and mustard were sown in May, then harvested from August into September. After this main season ground was sometimes left fallow until the following May, but some Badagas prepared soil almost immediately for chick peas (Cicer arietinum L.), fenugreek, lentil (Ervum lens L.), and poppies, which were all said to be harvested in December and January. Harkness, however, understated the maturation time for poppies—a period closer to nine months. Poppy seeds were probably planted in May, for cooler weather during dry months was the best time to extract poppy juice. In March and April seeds of gourds, pumpkins, and lablabab beans were planted. From the first two species and their progeny produce was gathered for years. Lablab beans mature in five to seven months, depending upon the variety grown. Another millet identified as koralie (another variety of Italian millet?) and sown in March–April supposedly took nine months to mature, but it is doubtful that this grain grew so long before maturing.

The two agricultural seasons of the year have persisted. Sowing and planting during the main season (karbokam) take place from March into April, and harvesting extends from July into September. In the
main season emphasis is placed on dry field food grain and cash crop production. Typical dry field crops are finger, Italian, and little millet, amaranth (*Amaranthus caudatus* L. and *A. hypochondriaeus* L.), barley (*Hordeum distichon* L. and *H. vulgare* L.), buckwheat (*Fagopyrum sagittatum* Gilib), potatoes, and other "English" vegetables. Koda millet is now rarely cultivated on the Nilgiris. Wheat (mostly *Triticum aestivum* L.) requiring drier conditions is grown in the main season on those sections receiving more rain during the easterly monsoon, but will be grown in the lesser season on other lands receiving more rain during the westerly monsoon. Many dry fields are left fallow between two main seasons, but kitchen gardens seldom are.

During the lesser season (*kadaibokam*) sowing and planting are performed from August into October, and harvesting extends from December into February. The lesser season is used primarily for growing seed potatoes and kitchen garden plants providing vegetables for home consumption or cash crops for sale. Assorted beans, cabbage, carrot, chick pea, coriander, fenugreek, garlic, lentil, maize, mustard, onion, pea, tomato, and turnip plants grown in kitchen gardens during the lesser season actually thrive in both seasons. Plant combinations within kitchen garden plots vary or sometimes remain the same from season to season (Figures 19 and 20). A kitchen garden plot in one season may also be covered by a dry field crop in the next. Perennial gourds and pumpkins are often grown on community middens or scattered odd plots. Little or no care need be given them, for seeds deposited on the ground from a few rotting fruits take root and form new generations.
Through irrigation farmers are now growing out of season crops, but irrigated crops still annually cover very small acreages. To take advantage of demands for potatoes during the tourist season reaching a peak in May and June, some farmers now plant potatoes from January into February. As early growth occurs during the dry season, potatoes would perish without irrigation at intervals. Expected mango showers during maturation aid in final development, and potatoes are harvested in May or June. Grain or "English" vegetables may then be grown without irrigation and harvested from September into October. Afterwards, land is left fallow until January or the main crop season (karbokam). Three harvests per year are obtained by a few farmers. Near the end of November, 1962, a man planted potatoes, kidney beans, and peas (Pisum sativum L.). Produce from these irrigated plants was harvested in March, 1963. Ground was prepared immediately for the main crop season, when unirrigated finger millet with mixed-in amaranth were sown. After harvesting of grain in August, potatoes with intercropped kidney beans or peas were grown without irrigation. The resultant harvest took place in November.

Past and present dry field crop production. By using several references to their agriculture, Badaga dry field crop production in the last century may be outlined. Crops were cultivated then on both terraced and non-terraced land. Due mainly to the need for protection against livestock, plots near communities were fenced in or protected by deep ditches and piled brushwood walls. When ground left fallow for long periods was prepared for cultivation, turf was pared off,
placed in small heaps, and burned when dry. Plows used in soil preparation were of a general type presently used in southern India. Some doubtlessly had a metal strip attached to the share, but Ouchterlony (1848: 31) stated that the share was "almost invariably a piece of pointed wood, of a tough description, hardened in the fire, and not shod with iron, or any other metal." Plowing was performed by two methods. In the first, a lead team of yoked cattle drawing a plow was followed by five or six similar teams drawing plows. After plows scraped a single furrow, paralleled furrows were formed by forcing the cattle to pull plows in lines paralleling the first. When the other method was used, a single team of yoked cattle pulled a plow over a field as many as five times. During each replowing, furrows were crossed. After the men had finished the plowing, women and children with small hoes worked over the soil, broke up clods, removed weeds, and piled them in small heaps. After the weeds were burned, the ashes were scattered over the ground. Cattle manure from cattle pens was mixed with community trash, loaded into baskets, and carried to fields. After being broadcast, the fertilizer was worked into the soil through another plowing or with hoes. Men broadcast seeds, or planted seeds, plants, and seed potatoes (later 1800s) in rows. Sown seeds were covered by a last plowing or light hoeing. Women and children usually weeded the fields two or more times. To speed this process up, rows of weeders sometimes worked cooperatively. Harvesting was performed by all family members, and sickles were the main harvesting implements. Bundles of straw with grain or baskets loaded with grain heads were carried as head loads to threshing floors. Temporary threshing floors
were constructed in the fields, but there were also well cowdunged permanent threshing floors within communities. To thresh out grain, cattle were muzzled, lined up, tied together and to a central post, and then driven around in circles over straw and grain. Women, however, used threshing sticks to thresh out grain on courtyards fronting houses. Sun-dried grain was stored away in large conical baskets plastered inside and out with cowdung, but finger millet was often kept in pits.

In 1908 plows were still being used, but by 1930 they were no longer in general use (Francis 1908: 166; Carl 1930: 32). The abandonment of plows resulted from the need for deeper soil turnover and ridging in potato cultivation. This was touched upon by Robertson (1875: 26), who stated that "as the native plough cannot ridge the land, the preparation of the soil, except the mere stirring and loosening, is all done by manual labor, and the cost of putting in the crop is much higher than it need be were a mouldboard plough used; . . . ." Three Swedish moldboard plows were sent to the Nilgiris in 1882-83, and a Badaga purchased one after a plowing exhibit at Ketti (Madras Department of Revenue Settlement and Agriculture 1884: 19; M.D. of R.S. and A. 1886: 6). However, Badagas never adopted moldboard plows. If they had done so, it is likely that plows would still be used. In 1908 potato plots were prepared through use of digging forks, introduced by the English, and hoes (Francis 1908: 167-168). During World War I, when potato production was greatly increased, the borrowed English digging fork rapidly replaced the plow. There is a distinct possibility that varied hoe-forks now used by Badagas were locally developed in that
period (Figure 15).

In present dry field crop production land occasionally remains unterraced, but is more often shallowly terraced. Many farmers are now, by requirement of the Madras Government, hewing out slopes to form horizontal croplands on tiered terraces (Plate X, C). Dry fields frequently remain unenclosed. When land left in fallow for some time is again to be cultivated, vegetation will first be removed and burned in small piles.

In preparing ground for potatoes, men turn the soil with digging forks. After about two or three weeks, clods are broken by women and children. Both blunt and forked sides of hoe-forks are used in this task. Undesirable stones and weeds are removed at the same time. Stones are utilized in terrace or wall construction, and ashes from weeds burned in piles are scattered over the land. Manure and compost brought in by women, bullock carts, or trucks are scattered over the soil. Badagas sometimes purchased buffalo-dung from the Todas. After fertilizer has been worked into the soil with hoes or hoe-forks, paralleled potato ridges are constructed with similar implements. As this is a hard task, men often assist. Men, women, and children do the planting. A small amount of chemical fertilizer is included with each seed potato. At least two weedicings are carried out through use of smaller hoes, hoe-forks, and small weeding-hoes. Women and children usually perform this task, and at the same time they mound the ridges. The first mounding aids in keeping spreading roots covered, and the second helps protect the plant bases from strong monsoon winds. Most family members work during the busy harvest season. After tubers dug
up with hoes and hoe-forks have been dried in the sun, they are removed in baskets to houses, storage huts, or awaiting trucks.

When grain is to be sown, soil is turned over by women using large- and medium-sized hoe-forks. Fields to be planted with grain are infrequently manured, and chemical fertilizers are seldom applied. If manure or fertilizer is used, it will be spread over the field and worked in. Grain broadcast over fields by men is then worked into the soil with hoes or hoe-forks. In the eastern Nilgiris, amaranth, mustard, finger millet, and Italian millet are still sown together. Amaranth, mustard, Italian millet, and little millet are also mixed. Barley, buckwheat, and wheat are usually sown separately. Women and children seldom weed grain fields more than once. Sickles are standard harvesting implements, and women usually remove the grain heads.

Varied processing of grain heads depends upon the grain harvested. Little millet is cut near the base of the stalk. Grains are then trodden out by cattle moving about a central post, as in former times (Plate X,D). Threshing-floors may be temporarily located in fields, or permanently near communities and on community courtyards. Threshed little millet dried out on courtyards for several days is winnowed and packed away in sacks or wooden chests. Finger millet grain heads cut off plants are tightly packed into sacks. After sack openings have been closed with bound string, the finger millet is stored away in warm parts of houses for four or five days. During this time the grain turns dark brown, but should not be permitted to blacken. When the correct color is reached, grain heads are removed to threshing floors. The treaded heads are saved and dried, so that remaining grains
may be removed through hand threshing by women with threshing-sticks. Finger millet is dried in the sun until individual grains crack when crushed between one's teeth. It is stored away after winnowing and may be kept for years without spoiling. Underground storage pits for finger millet are no longer in general use. After barley and wheat heads are removed, they are dried in the sun. Women, working on courtyards, use threshing-sticks to thresh the grain. Following further sun-drying and winnowing, grain is ready for storage.

**Livestock.** From the early 1800s Badagas have reared chickens, buffaloes, cattle, goats, and sheep (Keys 1812: 11; Birch 1838: 103-105). They never keep pigs, and chickens are not commonly reared. Because of close ties between bulls and Lord Shiva, the Saivite Badagas are not beef eaters. Mutton is eaten more than any other meat, so goats and sheep are kept as a meat supply. Milk processing into curds, butter, buttermilk, and clarified butter had been carried out by men in the sacred hagotus within houses. Only one to a few families in each community now own livestock, and sometimes a single male within a family will take care of the livestock. There are a few families which depend almost entirely on sale of mutton, milk, and milk products for a livelihood. Most, however, use livestock as a supplementary income source, or to obtain meat and milk for home consumption.

Religious ties between Badagas and their buffaloes or cattle, as demonstrated at Bergani, are also present in communities. Monday, Lord Shiva's day and a holiday, is a day sacred to the herd. In former times oxen were not worked and cows were not milked on this
day, but only the most devout follow this practice now (Harkness 1832: 114-115). In January, shortly before goddess Masthi Hethai is honored at Bergani, the Badagas celebrate Martu Pongal. Courtyards fronting houses are swept and freshly cowdunged. Women and children then decorate the courtyards with kitchen ash or powdered lime (Plate X, E). Before each house a square with diagonal lines is outlined. After the decorations have been completed, a priest leads a cow through the village from house to house. When the cow stops at each house, it is fed a flatcake made with millet, rice, or wheat and served on a platter placed in the center of the above-mentioned square (Plate X, F). Household women bow to the ground as the cow eats. After it has eaten and had its mouth washed off, the cow is led to the next house. Some time later a calf led around in the same fashion receives similar treatment at each house. Finally, community families feast upon flatcakes served with sugar or curry.

**Hunting.** Although writers have not referred to the Badagas as hunters, there is some evidence that they were. Past practices are probably preserved in more recent ritual. Among other acts connected with the opening of the main agricultural season at Melur, Francis (1908: 339) recorded that a hunting net was laid before a Badaga priest. After the priest had prayed for a favorable agricultural season, a pretense was made of spearing two fowls which had been thrown into the net, and it was then placed across a game path. A wild animal (sambar deer, if possible) driven into the net was slain, and Badagas divided its carcass among themselves. In July, 1963, a few Badaga men
from Ketti took the shredded remnant of a hunting net and two spears to a point upon the mountainside behind Ketti. While two men held up the net remnant, two with spears charged at it. Then all sat in a circle and sang folk songs before returning the equipment to the Hirodaya temple. Using these examples, it seems likely that the Badagas once hunted with nets and spears. Now they use muzzle-loaders, shotguns, and rifles. Although a few go hunting, most guns are employed in the protection of crops from such animals as black-naped hares (<i>Lepus nigricollis</i> F. Cuv.), pigs, and porcupines.

**Other occupations.** From the time Englishmen started to settle on the Nilgiris, outside employment became available. Both poor and wealthier Badagas took advantage of ever-increasing job opportunities. By 1829 many poorer Badagas were performing all types of labor (Hough 1829: 96). In 1860 a few were working on coffee plantations, but by 1868 many males were working as artisans or laborers on European-owned plantations (Markham 1862: 376; Shortt 1868: 58). There were Badaga clerks, cordite factory workers, building and road contractors, forest guards, gardeners, and school teachers by 1909, and before 1934 wage earning became the main means of livelihood for many Badagas (Thurston 1909, 1: 63; Ranga 1934: 11). Badagas are presently employed in the Government of India Cordite Factory, the Needle Industries (India) Ltd., and the Hindustan Photo Films Manufacturing Company in the Nilgiris. Some Badagas have a high school education, and a few are university graduates. As a result, there are Badaga clerks and professionals employed in private industries, or in positions with the
Central and Madras governments, on the Nilgiris and long distances away.

2. The Kotas

**Occupance pattern.** There have been but seven Kota communities from at least 1868 to the present (Shortt 1868: 55). These are named Kalac, Kinar, Kolmel, Kirgoj, Menar, Porgar, and Tiegar by the Kotas, but are commonly called Kalagasa, Kilkotagiri, Kolamalai, Padagula, Menada, Kotagiri, and Thurichagudi by non-Kotas. Six villages are on the upper Nilgiris, and the seventh is located within Gudalur in the Nilgiri Wynaad. This chapter describes the upper Nilgiri Kotas.

Harkness (1832: 74) observed that Kota houses and communities were like those of the Badagas. Although present Badaga and Kota occupance forms and their patterning are somewhat similar, these variations exist: Kota house-rows are shorter, and temples are not built into them. Confinement dwellings for women are also separate structures. Communities normally have two almost identical temples, but Kolmel has three. Kolmel also boasts a more recently constructed small Hindu temple which is no different from those found in neighboring Badaga communities. Each community has a smithy. Courtyards are less frequently edged by earthen or stone walls like the ones found in Badaga communities. Coffee and tea shops, supply shops, and business or government offices are normally absent. However, there is a coffee and tea shop at Kolmel. Monoliths, sometimes aligned on a meeting green, are distinctive features within some Kota communities. At Kurgoj, near two dolmens which appear to have been built rather
recently, there is a monolith over eight feet tall. Water storage tanks are being constructed, and pipes to provide water through faucets are being laid. Dirt roads running to communities are used mainly by trucks transporting agricultural produce or by government cars. Rarely does a Kota own a vehicle of any sort. There is a cremation center near each Kota village. In landscape utilization the Kotas generally parallel the agricultural upper Nilgiri Badagas, but they economically lag behind because of their much smaller population and low social position. The latter results in part from Kotas being hide curers at one time, and basket makers, blacksmiths, carpenters, musicians, and potters at present. Unlike their Badaga neighbors, Kotas have sought outside employment to only a limited degree.

Houses and temples. A photograph taken by Breeks (1873: Plate XV) indicates that Kotas at Kirgoj formerly dwelt in neatly thatched houses often aligned in short rows. Roofs covering the side-gabled houses also covered front porches, and some houses had low walls edging porches to both sides of left or right entranceways. Another photograph shows a side-gabled house with left front doorway and porches to both sides of the entranceway (Breeks 1873: Plate XXI). Wall posts supported the thatched roof, and walls were made with daubed over sticks which had been woven onto upright poles between wall posts. Thus, it seems likely that Kotas have for long dwelt in houses resembling the present house type. By 1909 some Kotas lived in houses with brick or stone walls and tiled roofs (Thurston 1909, 4: 4). These
houses stood by themselves, or were aligned into house-rows.

Present houses resemble Badaga houses in that they have porches at both sides of an entranceway, a front room (gudil), mortar in the same part of the front room floor, a kitchen (oolivai) paralleling the front room, and a fireplace across from the door dividing the two rooms (Figure 21). Kota houses are also constructed with bricks, sawn timbers, corrugated iron sheets, and tiles. Unlike Badaga houses, some Kota houses still have low walls fronting porches. All interior features are positioned according to the presence of a right or left entranceway. In Kota houses, front room platforms right of a right entranceway or left of a left entranceway are frequently used as storage platforms, and Kotas then sleep on the floors. Large, well-dunged storage baskets holding grain or pulses may be placed on the platforms. In the kitchens, females doing the cooking sit upon boards set into floors. The doorway between the two main rooms is not arched, but niches are usually built in both its sides. The back section of a Kota house is a bathing and sleeping area (gudagil). There may be one large room, but the back is sometimes divided into a bathroom behind the kitchen and sleeping or work room on the other side.

According to Harkness (1832: 74-75), in Kota villages there were always two temples having posts supporting gabled roofs thatched with grass, but Birch (1838: 106) said that the open-ended temples were similar to Toda temples. It may, therefore, be concluded that Kotas had gabled and barrel-vaulted temples in the early 1800s. Later photographic and written records indicate continued use of both temple types until the early 1900s (Breeks 1873: 43, Plate XXI; Thurston
Figure 21. Kota house plans
1909, 4: 4, illustration opposite 13). The barrel-vaulted temple shown in one of Breeks' photographs was outwardly no different from Toda barrel-vaulted huts. In the construction of a front-gabled temple, two stone pillars with notched tops supported the horizontal crest log. Four small stone pillars, also notched at the top and in pairs to both sides of the main pillars, supported two other horizontal roof logs. Parallel rafters were then laid in series over the crest log and two outer logs. Split-bamboo strips or poles, parallel to the three roof logs and in series, were laid over the rafters. The resultant roof frame was then thatched. Thatching and bamboo bundles at front and back were held in place with bamboo strips. Lastly, the temple roof crest was ornamented at both ends with varied motifs. Former temple types have now been replaced by a front-gabled temple type having brick walls and a roof made of sawn timber, corrugated iron sheets, and tiles. Old art motifs and roof features have been copied to some degree in new metal decorations (Plate XI, B). At the Kolmel Hindu temple, an ornate cupola rises above the deity's room, and there is a large adjacent windowed room with terra cotta bulls on its roof (Plate XI, C).

**Agriculture.** Harkness (1832: 30) described Kotas as cultivators of "a considerable quantity of the different kinds of millet and of the poppy, and sometimes a little barley." King (1870-71: 20-21) noted that they produced "fair crops of grain, millet, garlic, mustard, poppy, pulse of several kinds, and . . . 'prince's feather.'" Prior to 1850 grain was exchanged for iron from lowland traders, and
mustard was bartered or sold (Harkness 1832: 81; Ouchterlony 1848: 58). Besides taking a photograph showing a Kota plow, Breeks (1873: 42, Plate LXXVII) noted that Kotas raised the same crops as Badagas, were agriculturally equal to the latter, and did not extend cultivation even though they owned additional land. Thus, although information concerning Kotas is lacking, it is surmised that their agriculture during the 1800s was similar to Badaga agriculture. Furthermore, there was surplus produce for sale or barter. Changes in Kota agriculture paralleled changes in Badaga agriculture. Like the Badagas, Kotas once held land under the bhurty system of shifting agriculture, but were forced through the Final Land Settlement of 1881-84 to restrict their cultivation to taxed lands claimed and used by each person. By 1909 they were growing potatoes, and increased potato production led eventually to plow abandonment (Thurston 1909, 4: 8-9). By 1941 the Kotas had started cultivating tea (Mandelbaum 1941: 23).

Among Kotas, agricultural land held jointly and worked by sons is divided equally if they desire to own and cultivate their own plots. There is a main crop season (karbokam) and a lesser crop season (kadaibokam), but far more is produced during the main season. Commercial crop production, with stress on potato growing, is now emphasized. The Kotas use agricultural implements identical to those which they forge for the Badagas. There is a distinct possibility that Kotas invented the hoe-fork in response to the need for a new potato cultivation implement.

These plants grown at Kinar during the main season, 1963, point out similarities between Badaga and Kota agriculture: Near the
community there grew scattered chili (*Capsicum annuum* L.), chow-chow, pumpkin, and tomato plants. In kitchen gardens round about there were 1) very small scattered plots supporting amaranth (*Amaranthus hypochondriacus* L.), beans (*Vicia faba* L.), peas, or maize; 2) a small plot planted with rowed pole-beans (a variety of *Phaseolus vulgaris* L.); 3) a majority of plots covered by interplanted beans (*Phaseolus vulgaris* L.) and potatoes growing in rows; 4) a small plot with beans (*Phaseolus vulgaris* L.) rows running in one direction and pea rows in the opposite direction; 5) plots devoted to mixed coriander and mustard; 6) small plots covered by fenugreek; and 7) larger plots planted to cabbages in rows, garlic, or onions. Amaranth, beans (both species mentioned), peas, and maize were also planted in rows along plot edges or among other plants. Over dry fields there were 1) amaranth (*Amaranthus hypochondriacus* L.), mustard, finger millet, and Italian millet mixed together before sowing; 2) different barley species (*Hordeum distichon* L. and *H. vulgare* L.), each grown in separate fields; 3) potatoes covering more land than any other crop; and 4) wheat (*Triticum aestivum* L.). On mountain slopes near Kinar there are Kota tea gardens with tea bushes shaded by silver oaks. Tea leaf may easily be sold at the nearby Kil-Kotagiri tea factory. Some Badagas in the area have an agreement with Kotas whereby Badagas plant Kota land with tea, take care of the growing tea plants for three years, and then split land ownership. Kotas thus increase their own tea acreage, but lose land in the process. Kinar Kotas also have multilayer gardens with coffee shaded by scattered lime and forest trees. In the valley bordering their village they own small pear orchards, and a few scattered
cherimoya and mandarin orange trees also grow in the valley.

Livestock. In the early 1800s Kotas kept many cows and female buffaloes, but livestock evidently served only as a reserve meat supply (Harkness 1832: 78). Furthermore, if Ward's statement is correct, livestock could not be slaughtered, and Kotas ate only the flesh of animals dying naturally (Ward 1821: lxxvii). Milk, with the possible exception of milk drawn and used ritualistically by priests, was not consumed by Kotas (Hough 1829: 107). When they required clarified butter (ghee) for ritual, it had to be obtained from neighbors (Harkness 1832: 78). When the Kotas desired to milk buffaloes around 1864, neighbors (presumably Badagas and Todas) vetoed the idea (Metz 1864: 128). By 1870 buffaloes were slaughtered, for King (1870-71: 42) wrote that Kotas "do not milk them at all, but kill them as required, for the sake of their flesh only." Besides eating untreated buffalo flesh, the Kotas dried excess meat for later use. In the first decade of this century the previous practices continued. Thurston (1909, 4: 10) mentioned that Kota priests were not permitted to eat cow's flesh, but whether or not this was a new practice is debatable. By 1934 Kotas were drawing milk from their livestock and processing it into milk products (Emeneau 1946, 3: 309). They presently keep goats and sheep as a meat source, just as the Badagas do, but have given up eating buffalo or cattle flesh. Buffaloes and cows are kept for their milk. Kotas, like Badagas, have constructed more livestock huts and now realize the value of compost pits. That the Kotas have not lost their old respect for milk is demonstrated by the fact
that they, unlike the Badagas, use only cow's milk, milk products, and resin incense (from *Canarium strictum* Roxb. trees) burned over jambalona (*Syzygium jambalorum* DC.) charcoal when worshiping their traditional deities. When they worship Hindu deities, bananas, coconuts, and Mysore stick incense are used.

**Hunting.** Ritual indicates that Kotas, like Todas, may once have used bows and arrows. Breeks (1873: 47) stated that a bow and three arrows were burned with each male skull fragment in a Kota dry funeral. The Kotas also supplied the miniature ceremonial bow and three arrows burned at a dry funeral for a Toda male (Breeks 1873: Plate XI). The bow and arrows could not have been used for hunting. Rivers (1906: 638) mentioned that Kotas were still supplying bows and arrows at Toda dry funerals for males in the early 1900s. Kota-made bows and arrows are no longer used at either Kota or Toda funerals. Photographs of Kota temples show an art motif at the ends of temple roofs that possibly represents a bow and arrow. Thurston (1909, 4: 16) wrote about bow and arrow use in the closing phase of the annual Deities' Festival.

On the last night priests and other men left the village and went mock hunting with bows and arrows. They stayed away from one to three in the morning. During former times the gaur was supposedly shot during real hunting expeditions. In the early 1900s, the two-hour period when the men were absent was used for secret ceremonies. Those not participating did not know what went on. My attempts, in 1963, to see bows and arrows, said to be taken out once a year during the Festival, ended in failure. Because writers have not referred to Kotas as
hunters with bows and arrows, it is likely that Kotas have not hunted with bows and arrows from at least the early 1800s. If they are used, visitors to a region are quick to observe the use of bows and arrows. If Kotas hunted in the last century, they probably used spears and nets like those belonging to neighbors. Presently, Kotas use guns to protect their crops and hunt game.

Kota trades and work for outsiders. There is a possibility that in 1812 at least one Kota was a brass-smith, but this trade appears not to have been practiced since the start of European settlement (Keys 1812: li). With the exception of Keys (1812: li), Harkness (1832: 30), and King (1870-71: illustration opposite 24), other writers have not labeled the Kotas as goldsmiths or silversmiths. King illustrated a Toda necklace with silver beads and claimed that it was made by Kotas. If Kotas were once goldsmiths and silversmiths, it is assumed that they abandoned these trades long before the end of the nineteenth century.

Hough (1829: 104) wrote that the Kotas carried "on an extensive trade in skins with the natives below, and are faithful to their contracts." Iron was one object obtained through bartering of skins. Kotas then had the right to claim and skin all animals dying a natural death, and in return for this right provided pots and agricultural implements to other Nilgiri tribal people (Hough 1829: 104). They ate fresh meat and carrion from different animal species. Todas gave Kotas the right to all buffaloes sacrificed at funerals. According to Harkness (1832: 80), some dead buffaloes were received free for services rendered by Kotas during a funeral and at other times, but for
the remaining dead buffaloes Kotas would pay from four to eight annas per carcass. Low country dealers considered buffalo hides prepared by Kotas superior to those obtainable on the plains, so the hides were much in demand (Harkness 1832: 81). By 1864 the best hides were sent to a government tannery at Hoonsoor, and rejected hides were made into ropes (Metz 1864: 131-132). In 1909 the Kotas still obtained buffalo and cattle carcasses from other Nilgiri inhabitants. They sold horns to Labbai (Muhammadan) merchants from the plains, and Chakkiliyans (leather-workers) from the nearby lowlands collected bones besides purchasing hides. Supply of hides to the Hoonsoor tannery had apparently long since been stopped. Kotas cured hides with avaram (*Cassia auriculata* L.) bark, lime, and sun’s energy working upon hides pegged out on the ground (Thurston 1909, 4: 8). In 1941 the Kotas still ate carrion and played music at Toda funerals (Mandelbaum 1941: 20, 23). Therefore, they were probably curing hides at that time. Since Indian independence, August of 1947, laws and governmental actions aimed at breaking down caste structure have greatly affected the Kotas. As part of an attempt to raise their social status and prove that they are the equals of Badagas and Todas, as the law assumes, Kotas have stopped eating beef. Because of the rift in traditional relationships between the Kotas and Todas, Kotas no longer attend Toda funerals and, therefore, no longer receive sacrificed buffaloes. Chakkiliyans living in the Nilgiris now attend Toda funerals and purchase buffalo carcasses directly from Todas. Due to their changed outlook on life, the Kotas have also abandoned hide curing.

Some Kotas claim that their ancestors wove coarse cloth from
spun nettle fibre, and fashioned stone massala stones (querns), door posts, and holed posts for cattle-pen entrances. Because Thoraiyas probably wove similar cloth and since the Kotas are such skilled artisans in other fields, the claim is probably true.

Prior to 1835 the Kotas were basket makers, blacksmiths, carpenters, musicians, and potters (Keys 1812: li; Ward 1821: lxxvii; Harkness 1832: 76-78). At present there are Kotas working in all five trades, which tend to be inherited. One family may have a potter, there may be three blacksmiths in another family, while most family members play some part in crop cultivation and care. Men and women weave coiled baskets with split bamboos. Flat drying baskets used by Badagas and Kotas in kitchens, large storage baskets, and ornamental funeral baskets are among the basket types woven. Into the early 1900s Kotas fashioned umbrellas, apparently with bamboo from outer slopes and palm leaves carried up from the plains (Thurston 1909, 4: 7). Carpenters work in rooms behind front rooms in homes. They use an assortment of chisels, drills, hammers, jack planes, mallets, and saws. Most metal tools are purchased. Upper Nilgiri plows were once fashioned by the carpenters, but they now concentrate on production of home objects such as furniture, doors, door frames, and wooden roof features (Breeks 1873: explanation of objects in Plate LXXVII; Ward 1821: lxiii). Kota male musicians use four instruments: 1) a double-headed drum, 2) a larger diameter single-headed drum struck by a stick rather than the hand, 3) a clarinet, and 4) a large brass horn purchased at Karamudai or elsewhere on the plains (Plate XI, D and E). The round-bottomed, large drum in some Kota settlements is used only
upon ceremonial occasions. For diversion, Kota men may play a base flute. Potters are always women, who fashion pots on a stone potter's wheel set up in front of their houses as needed. This wheel is turned by one woman, while another woman molds the clay which has sand binding it together. Clay, easily obtained locally, is worked to the right consistency through pestling and hand kneading. Completed pots, first dried in the sunlight, are then aligned and covered with wood which is ignited. The smithies constructed with brick, corrugated iron sheets, and tiles are activated before both crop seasons. Smithy structures vary in construction and the spacial arrangement of inside features. All types of agricultural implements, knives, and axes used by Nilgiri inhabitants are manufactured by Kotas. Iron obtained in local markets is heated over a charcoal fire blown by either two hand-manipulated bellows made of cattle or deer hide, or a more modern hand-cranked metal blower purchased in a store. Pieces of iron attached to wooden blocks once served as anvils, but Kotas presently use anvils manufactured in Europe (Breeks 1873: explanation of objects in Plate LXXVII). Several men must work together when implements are being fashioned. One works the bellows or metal blower, another heats iron and transfers it to an anvil, while the third hammers the iron into shape and tempers it in water (Plate XI, F).

Trades tend not to be as important an income source as they once were. Although Kota musicians provide music at Harvar festivals or funerals, they no longer attend Toda funerals and are seldom called upon by Badagas. Mass-produced pots, aluminum vessels shaped like pottery antecedents, and baskets imported from the plains have led to
a decreased demand for Kota-made products. The imported goods are sold in local markets, or are carried to Nilgiri hamlets and villages by wandering vendors. There are now Badaga, Malayalee, or Tamilian blacksmiths and carpenters who are easier to contact than Kotas living some distance away, so other upper Nilgiri inhabitants have naturally turned to nearby craftsmen. Blacksmithing has suffered the least, for there is sufficient demand for this skill to keep Kotas working feverishly before each agricultural season. Badaga, Irula, Kurumba, and Toda implements are made, repaired, or sharpened. In recent years the Madras Government has attempted to rejuvenate lagging Kota trades. At Kirgoj there is a rattan furniture making center. Tiegar has a pottery center, as well as a workshop where women may fashion and paint small wooden fretwork objects. The Government sells the Kota-made objects in tribal art stores on the upper Nilgiris and in cities as far away as Madras.

According to Harkness (1832: 78), Kotas occasionally assisted Badages in harvesting their crops, and Shortt (1868: 53) stated that they performed menial tasks for Badaga and Toda families with whom they retain traditional contacts. For example, at a Toda funeral in 1963, a Kota from Tiegar took care of the funeral pyre. Kotas in the same village will sometimes aid in harvesting Badaga crops around nearby Iduhatti. Kota children are now receiving a free education from the Government, and educated Kotas are increasingly being employed, for example, as clerks, factory workers, or teachers. Kotas have generally not sought work as laborers on plantations or in public work projects and are, therefore, different from Badagas in this respect.
Mixed data employed in the reconstruction of past Badaga dry field farming practices came from these sources: Grigg et al. 1880: 465, 468-470; Baikie 1857: 91; Hough 1829: 95; Breeks 1873: Plate LXXVII; Ouchterlony 1848: 31-33; MacPherson 1820: lix; Markham 1862: 367; Harkness 1832: 37, 114, 135.

Cf. Harkness 1832: 79, "... they are particularly fond of flesh of almost every description, nor do they care in what manner life has become extinct in the animal. What the tiger or wild dog [Cuon alpinus Pallas] has left of his prey, is, to them, an acceptable repast. They are known, like vultures, to follow a drove of bullocks bringing up supplies from the low country, calculating to a nicety that such as they have marked will die before they have proceeded many miles further up the mountains. The dead animal is of no value to the merchant or drover, and the Cohatars are therefore allowed to take possession of it." King 1870-71: 39, "... they are also unclean feeders, devouring dead cattle, putrid flesh, birds of prey, or vermin, with as much relish as fresh buffalo-meat, for which, unlike the Todas, they have a great predilection. I have myself seen a Kota carry home for food a dead rat thrown out of the stable, a day or two previously by my ghorawallah." Thurston 1909, 4: 6, "An unappetising sight, which may be witnessed on roads leading to a Kota village, is that of a Kota carrying the flesh of a dead buffalo, often in an advanced stage of putridity, slung on a stick across his shoulders, with the entrails trailing on the ground."
CHAPTER VI

NILGIRI WYNAAD BADagas AND KOTAs

The few scattered Badaga communities in the Nilgiri Wynaad have resulted from slow and continuing Badaga colonization which may extend back to a pre-1800 date. The ancestors of Kotas occupying a single hamlet probably came to serve the Todas who once lived in the Wynaad. Although Nilgiri Wynaad Badagas and upper Nilgiri Badagas are culturally affiliated, the occupancy patterns related to them vary (Table IV). Several factors are responsible for the variations: Because the Wynaad is covered by a plateau with rolling hills and occasional ranges, topographic conditions are ideal for growing wet rice in broad valleys and dry field crops on hills. The climate is warm enough to permit the growth of wet rice, but too dry for two rice crops to be harvested annually from a single field. Dry seasonal conditions, reflected by estivating trees, also lead to the growth of only one dry field crop per year. Combined with the physical influences are the Malabarian, Malayalee cultural influences. Thus, Badaga house construction, employment of Paniya laborers, garden maintenance, and manner of wet rice cultivation with aid of implements drawn by buffaloes follow patterns associated with their neighbors. Kalac Kotas at Gudalur, who live in atypical houses and have lost their dry fields, continue to cultivate wet rice in the same manner as the Badagas. Nilgiri Wynaad Kota trades are similar to those of upper Nilgiri Kotas.
### TABLE IV
**PRESENT DAY BADAGAS AND KOTAS OF THE UPPER NILGIRIS VERSUS THOSE INHABITING THE NILGIRI WYNAAD**

Categories omitted are not applicable.

<table>
<thead>
<tr>
<th>GROUP : UPPER NILGIRIS</th>
<th>OCCUPANCE SITES</th>
<th>ASSOCIATED CENTERS</th>
<th>OCCUPANCE TYPES</th>
<th>MAIN ASPECTS OF THE ECONOMY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BADAGAS : UPPER NILGIRIS</td>
<td>Hamlets and villages</td>
<td>Burial-cremation and worship centers</td>
<td>Side-gabled houses and half-houses, Side-gabled temples, similar to the houses, Variants of temple with cupola</td>
<td>Badaga master and Thorayya servant relationship, Agriculture: few multilayer, more single layer, and many kitchen gardens, orchards: nectarines, peaches, pears, plums, dry field commercial crop production: mainly potatoes, secondary dry field crop production: amaranths, barley, millets, wheat, Acacia and eucalyptus trees grown for bark tannin, eucalyptus oil, and firewood, Livestock rearing: chickens, buffaloes, cattle, goats, sheep, Limited hunting: small to large game, jungle fowl, Wage earning: laborers on plantations, gardeners, factory workers, clerks, school teachers, engineers</td>
</tr>
<tr>
<td>KOTAS : UPPER NILGIRIS</td>
<td>Six villages</td>
<td>Cremation and worship centers</td>
<td>Side-gabled houses, similar to the Badagas, Front-gabled temples, Single temple with cupola</td>
<td>Agriculture: similar to the Badagas', but on a smaller scale, Grow some acacia and eucalyptus trees, Livestock rearing: similar to the Badagas', Limited hunting: similar to the Badagas', Trades: basket makers, blacksmiths, carpenters, musicians, potters, Limited wage earning</td>
</tr>
<tr>
<td>BADAGAS : NILGIRI WYNAAD</td>
<td>Hamlets and dispersed houses</td>
<td>Burial-cremation and worship centers</td>
<td>Hipped-roof houses, Pyramidal-roof temples</td>
<td>Badaga master and Paniya servant relationship, Agriculture: multilayer, single layer, and kitchen gardens, limited dry field crop production: millets, wet rice cultivation: subsistence base, Livestock rearing: buffaloes, some cattle, Some men working on plantations</td>
</tr>
<tr>
<td>KOTAS : NILGIRI WYNAAD</td>
<td>One village</td>
<td>Cremation and worship centers</td>
<td>Front-gabled temple</td>
<td>Agriculture: a multilayer garden and small kitchen gardens, wet rice cultivation: subsistence base, Livestock rearing: buffaloes, some cattle and goats, Trades: basket makers, blacksmiths, carpenters, musicians, potters</td>
</tr>
</tbody>
</table>
1. The Badagas

**Occupance patterns.** The Badaga communities of Basukolli, Devala, Kolapalli, Marakarai, Nundhatti, Pandalur, and Soladi are scattered over the Nilgiri Wynaad (Figure 2). They lie in sections with deciduous forest remnants and patches covered by bamboo thickets. The tendency for Badagas to live in nucleated communities according to ancestral custom is in the Wynaad opposed by the tendency for people to scatter over the landscape according to Malabarian custom. As a result, at one community members live in a hamlet, at another some live in a hamlet while others own houses dispersed over the nearby landscape, and at a third all Badagas dwell in dispersed houses within the area covered by the community. To cite specific examples, Marakarai has a hamlet, Devala has a hamlet and dispersed houses, and all Soladi houses are dispersed. Nucleated development follows three steps: 1) a single house is or a few joined houses are first constructed next to a courtyard, 2) a new house is then positioned adjacent to the courtyard and approximately vertical to an antecedent house, and 3) another house is built on the other side of the courtyard and approximately parallel to the previously constructed house (Figure 22). Figuratively, development leads to change from a straight line to an L-shaped to a U-shaped house arrangement. Single dispersed houses are also fronted by courtyards. The growing of at least one sacred tulasi plant within a small rectangular enclosure on each courtyard is a distinctive Badaga cultural trait. Frequent sweepings with a cowdung solution over courtyards, ground surrounding houses,
Figure 22. A Wynad Badaga hamlet
and house floors is not only an ancient Hindu custom, but a useful one in that it helps keep termites away.

Rice is everywhere the predominant food crop, and wet rice production is concentrated in broad valley bottoms (Plate XII, A). As a result, valley sides are seldom terraced. All Badaga houses, whether they be within nucleated centers or scattered around, are located on hillsides or hilltops next to lower-lying wet rice fields. Women thus have to fetch water from streams in the valleys below. Occasionally, small huts or shelters (pandals) for storage or work are erected near houses. Nilgiri Wynaad Badagas do not build temples in house-rows, but do construct temples in separate worship centers with pagoda trees. After the single wet rice harvest, buffaloes and a few cattle are kept at night in periodically shifted circular bamboo pens erected on dried fields. While rice is growing, the same livestock are housed nightly in huts with no set form located at some distance from dwellings. Threshing floors and stacked hay lie near dwellings. Most houses are surrounded by multilayer gardens which offer cooling shade during each dry season and protection against torrential rain with high winds during the rainy monsoon seasons. Close to houses there may also be small kitchen gardens or single layer gardens. Scattered dry fields on hills are located near or at some distance from houses. Livestock (goats and sheep were not seen by me) are grazed on 1) rice stubble left after each rice harvest, 2) grasses growing over dry fields untilled for some time, 3) grasses within nearby degenerate dry and moist deciduous forest or bamboo thickets, and 4) savannas. In the area associated with each community
there is a burial-cremation center. All communities are in easy walking distance from roads, and narrow paths—sometimes running over dikes separating wet rice fields—are used to gain access to roads.

**Houses, temples, and shrines.** Excluding certain resemblances in the interior plan, the Nilgiri Wynaad Badaga house type is quite different from the one used by upper Nilgiri Badagas. Each house has an earthen platform, often partially made with fine earth from termite hills (Figures 22 and 23). Six large posts embedded in the platform are surmounted by pole plates supporting a series of rafters. Out from these posts, on or along the edge of the platform, there are additional lesser posts surmounted by pole plates supporting the rafters. The steep-sided hipped roof slopes down from a short horizontal crest to a height of about five feet from the ground (Plate XII, B). Most roofs have rice straw thatch over bamboo strips lashed onto rafters, but a few houses now have tiled roofs. A rectangular house wall raised around the six large posts is constructed with mud similar to that used in the platform. The wall is built around wooden door frames and occasional window frames. Because there is space left between the wall and platform edges, a veranda runs around the house. An entranceway edged by shallow walls, typically made by Nilgiri Wynaad Badagas, often runs across the veranda. In a house-row some side walls serve two houses, the roof crest is elongated, and a veranda usually runs around the combined houses. A shrine or storage room built next to a normal dwelling is incorporated into a house-row. If a house front is considered to be the side edging a courtyard,
Figure 23. Occupance forms constructed by Wynaad Badagas and Paniyas
an entranceway may be placed on either its left or right side. In addition to the front door, a rear or side door is also included. A chicken coop is sometimes built on the veranda, and a large grain basket, quern, firewood, or other objects may be stored there. In house interiors, through placement of storage baskets or dividing wall construction, a left kitchen side may be visibly differentiated from the right living area and sleeping side. If there is no visible reminder, occupants simply remember that such a division exists. As there is no sleeping platform, household members sleep on mats spread over the floor each night. The kitchen fireplace is located next to the center of the left wall, and there is sometimes a large circular drying basket suspended over it. An upper storage platform extending over the warmer kitchen side is reached by a ladder.

A Nilgiri Wynaad Badaga temple may outwardly be constructed somewhat like a house (Figure 23). The Devala temple has no inner or outer posts, so squared wooden rafters are attached to wall plates and an emplaced ridgepiece. The hipped roof is tiled. Inside the temple there are two large stone bulls (Nanthis) and an altar next to the center of the rear wall. Temples of a distinctive type serving as worship centers to Badagas and their neighbors have square bases, grilled woodwork in side walls, and pyramidal roofs plated with copper sheets (Plate XII, C). In each temple's interior there is a walled room holding a deity's image, a ceremonial knife, and other ritualistic paraphernalia. Smaller shrines with similar appearance (Plate XII, D) have platforms in their central interiors. The sacred structures with pyramidal roofs are identified with so-called Chinese temples in
Malabar, and may in reality reflect past cultural influences of the Chinese who once maintained trade contacts with Malabar.

**Paniyas and Badagas.** A glimpse of Nilgiri Wynaad gold mining in the early 1800s appears in a letter written by Nicholson (1833: 90). The Nilambur raja then employed Chetties on a concession basis to superintend slaves working in mines. The slaves are not identified, but were almost certainly Paniyas. If these slaves did not produce the expected daily allotment, they were flogged and their limbs were crushed in a device which might with repeated use disable a person for life. When planters started to settle in the Wynaad during the 1850s, Paniya serfs were included with the land purchased by the Englishmen (Thurston 1909, 6: 58). Because the English freed the Paniyas, work on plantations supplied an alternative to serfdom from then on. However, in the 1930s Ranga found that many Paniyas remained serfs working mainly for Chetties, but some Paniya families were attached to Badaga families. Owners who inherited Paniya families were responsible for their support and the marriage of each family member. They had to consent to a Paniya marriage and paid the marriage expenses. In the harvest season especially, Paniyas were commonly rented out. In return for services rendered, Paniyas received daily meals and frequent issues of rice. Shortly before harvest, most owners permitted the members of each Paniya family to select a small plot with ripened grain. The family members then harvested the grain for their own consumption. When a Paniya family built a new home, the materials were supplied by the owner, who also provided food during the course
of construction. Families were given clothing annually. Each week Paniyas received small monetary amounts which enabled them to purchase condiments or other articles in the local market. Betel leaves, areca nuts, and other chewing ingredients were issued weekly. On festival days Paniyas were feasted and given sweetmeats (Ranga 1934: 55-59).

Master-serf relationships still persist in the Nilgiri Wynaad. Not all Badagas have Paniyas working for them, but when such a relationship exists Paniya females and males perform many of the agricultural tasks. The women also prepare grain with mortar, pestle, and winnower, and carry water to Badaga houses. Using split bamboos, Paniyas make any type of basket that is required. These people live in houses built somewhat like Badaga houses. However, their houses have smaller dimensions, usually one door, and walls built of woven bamboos frequently covered with daub (Figure 23). The houses are arranged haphazardly in a nucleated community or are dispersed over hills. They are normally not far from Badaga dwellings. Paniyas have their own burial centers and worship centers with shrines.

In addition to receiving food allocated by their masters, Paniyas obtain produce from garden plants grown near their dwellings. They fish with aid of bamboo mats, bamboo fishing scoops, and fish poison (crushed Randia dumetorum Lamk. fruit). Most fish are caught during the harvesting period and in the ensuing dry season. Fishing is then facilitated by the concentration of fish in small water bodies left after the evaporation of moisture from fields, ponds, and streams. An occasional food source for Badagas, Paniyas, and other Nilgiri Wynaad residents are the many bamboo seeds, called bamboo rice, which
are collected when bamboos (*Bambusa arundinacea* Willd., *Dendrocalamus strictus* Nees) periodically produce seeds and die off.

Mullu Kurumbas living in the western Nilgiri Wynaad and nearby Malabar Wynaad frequently hunt with bows and arrows. However, in 1963 I found no proof of their use by the Badagas and Paniyas inhabiting the Nilgiri Wynaad. Again, the evidence indicates that in most of the Nilgiri region hunting nets and spears have in the past been standard hunting implements. Paniyas have gained a reputation for hunting tigers with hunting nets and spears. According to Francis (1908: 30-31), hunting nets from various households were joined into a "V" surrounding a tiger. Directed by Paniyas up in trees, other Paniyas with spears drove the tiger toward the "V's" point while simultaneously closing the opening. The surrounding nets were slowly moved in during a period of several days, and Paniyas lit nightly fires all around the enclosure. Finally, the half dead and harassed tiger was speared to death. Similar hunts are said to still be held upon occasion.

Gardens. In multilayer gardens around houses these species were noted: guava, jack, mandarin orange, mango, pagoda, pummelo trees, areca (*Areca catechu* L.), fishtail (*Caryota urens* L.) palms, banana fronds, papaya plants, sugarcane, shrubby amaranth (*Amaranthus cruentus* L., common race), brinjal, castor, chili (*Capsicum annuum* L.), coffee, okra (*Hibiscus esculentus* Bend.), tomato, edible root-yielding canna, elephant foot yam (*Amorphophalus campanulatus* Bl.), tapioca, taro, creeping lablab bean, bitter-gourd, pumpkin, rose, sweet-potato,
and yam (compare with Table II).

Flowers and leaves of fishtail palms are used for ornamental purposes. Badagas also grow bananas in single layer gardens. After cutting off stems laden with green bananas, Badagas and Paniyas place them in banana pits with pots in which green wood is burned (Figure 23). The heat and smoke within pits sealed with planks and mud cause bananas to ripen rapidly in two or three days. Leaves from planted amaranth are the only parts eaten. Badagas also eat leaves plucked from wild amaranths (*Amaranthus gracilis* Desf., *A. spinosus* L.) commonly growing in gardens. Leaves and roots of planted taro are edible. However, only the leaves cut from wild taro (*Colocasia antiquorum* Schott) growing next to streams and in gardens are eaten. Ceara rubber plants (*Manihot glasiovii* Muell. Arg.) descended from stock used in experimental rubber production on adjacent plantations are now weeds occasionally left growing in gardens. Brinjal and chili seeds are first sprouted in a small nursery on stilts (Figure 23). Both plants are also planted in kitchen gardens with parallel earthen ridges. At Nundhatti, in 1963, there was a ridged kitchen garden with alternated kidney beans, brinjals, chilies, and maize. Elephant foot yam or taro are occasionally grown on ridges within single layer shaded gardens (Plate XII, F). Tapioca is increasingly being cultivated as a dry field crop planted on hoed ridges, but is not a typical Badaga crop.

**Dry field agriculture.** As upland dry fields are often left fallow, only small acreages are covered with crops at any single time.
In field preparation, natural vegetation which has spread into fallow fields is cleared, dried, and burned. Ashes are then spread over the earth. If available, livestock dung is applied. Soil is loosened by periodic plowings with a plow drawn by a single team or by several teams drawing plows simultaneously. Earth clods are broken with hoes and hoe-forks, and the same implements are used to work broadcast seed into the soil. Sowing takes place mainly in June and July, so that harvesting will occur during a period of declining rainfall in October, November, and December. Finger millet is commonly grown, and little millet is occasionally cultivated. Mustard may be mixed with the grain crop, and in one field I saw there were pumpkin vines growing over termite hills. Some fields are quite neglected, and others are weeded to varying degrees. In harvesting, sickles are used to remove grain heads. When finger millet is harvested, the grain heads are first processed in the same way that upper Nilgiri Badagas process them. Grain is stored after being trampled out by buffaloes or cattle and dried in the sun. Men are responsible for heavy work in field preparation, plowing, sowing, and care of livestock trampling out grain. Women, aided sometimes by children, do most of the other work associated with dry field cultivations.

Wet rice cultivation. During the dry season, after livestock have eaten remaining rice stubble, exposed soils on fields become hardened and cracked in the sun's heat. Livestock penned on changed locations help fertilize the earth. Starting in April, after some mango showers have loosened field surfaces, the men prepare a few
fields. A single plow, usually pulled by two buffaloes, may be drawn back and forth over a field. At irregular intervals of days or even weeks the field will be replowed until it has been plowed four to six times, with former plow lines being crossed at each replowing. If several buffalo teams are available, plowing may be speeded by teams working simultaneously in a single file. Dikes to retain rainwater must also be rebuilt or repaired with the aid of hoes (Figure 15), and at least the final plowing is performed in fields well soaked by rainwater backed up behind the dikes. Drawn harrows aid in the leveling and mixing of soil. Puddlers are lastly used to flatten and smooth surfaces about to receive rice seeds. Prior to broadcasting, the seeds are usually mixed in a cowdung wash and left sitting for several days in a small heap covered with leaves. Broadcast seeds stick in mud and there take root. Plants may remain untouched until harvesting, but most seeds take root in selected nursery fields from which plants are later pulled up and transplanted.

Because seeds are planted on nursery fields from April into June, the transplanting period extends from June into August. It is during this period that most fields are plowed, harrowed, and puddled (Plate XII, E). In addition to supplemental dung fertilizer deposited on the fields, green leaves are trampled into the mud by the feet of humans and livestock. Field preparation is men's work, but only women transplant young rice plants. The young plants, pulled up after approximately 40 days, are tied into bundles. By twisting off plant tops, each bundle top is flattened. Bundles carried to prepared fields are broken up individually as a field is planted. Two or three plants
are planted together each time, and small clumps are spaced about nine inches to one foot apart. The amount of weeding performed by women and children before or after rice is transplanted depends upon the individuals concerned, but some weeding is usually done. As rice ripens, watch-huts built on stilts amidst fields or on hill slopes nearby are occupied in shifts by men, women, or children who make noises to drive away animals and birds. Harvesting takes place mainly in January, but rice is also harvested in December and February. Grain removal is facilitated by the fields drying up before harvesters, mainly women, start working with sickles. Cut rice stalks are carried in headloads by men and women to threshing floors near the houses. Muzzled bulls are strung together and forced to walk abreast around posts rising from threshing floors. Grain on hay laid beneath the bulls' feet is thus slowly threshed out. Months later, other grain is threshed in like manner from straw piled on stilted platforms or straw heaped about poles rising near threshing floors. Sun-dried grain is stored within large grain baskets or wooden chests placed in homes. The remaining threshed straw is fed to livestock or used for thatching.

**Additional income.** As far back as 1881 the Badagas were working on neighboring plantations, and a fair number of males are presently employed on plantations (Jennings 1881: 60). A few Badagas obtain income by selling milk to coffee and tea shops in nearby villages.

2. The Kotas

Most Kotas at Kalac, Gudalur, live in eight houses with brick
walls and tiled roofs built for them by the Madras Government. A small smithy stands near the houses. The two identical temples with mortared stone walls and corrugated iron roofs are on the mountain-side above the community. A hospital is not far away, and the Kota village is now almost surrounded by the houses of urban dwellers.

Near the community in 1963 there was a poorly kept multilayer garden with jack, mango, orange, castor, coffee, chili, tomato, wild amaranth, wild taro, turmeric, and bitter-gourd plants. Cabbage, knolkohl (Brassica oleracea L. var. caulo rapa DC.), and mint (Mentha virdis L.) grew in small kitchen gardens next to houses, and there were a few scattered chrysanthemums. Finger, Italian, and little millet, amaranth, and mustard were once cultivated on dry fields, but Kotas slowly lost these fields through litigation and sale of land to outsiders. They still own wet rice fields in the valley below and cultivate rice in the same manner as Badagas. Basket makers, blacksmiths, carpenters, musicians, and potters live in Kalac. Kalac Kotas once played music at Badaga funerals, and supplied iron implements, plows, and pots to the Badagas, but they no longer trade with or perform services for Badagas and now earn much of their income in Gudalur (Ranga 1934: 53-54). Buffaloes, cattle, and goats are kept in livestock huts below the settlement or are penned on fields after the rice harvest. Due to the encroaching urban expansion generated by their neighbors, it is becoming increasingly difficult for the Kotas to find adequate pasturage for their livestock. Like other Kotas, Kalac inhabitants profess to have stopped eating beef and say they eat only mutton.
CHAPTER VII

CONCLUSIONS

Major variations in the occupancy patterns, occupancy forms, and economies associated with the five ethnic groups largely result from 1) the concepts of occupancy brought to the Nilgiri District by ancestors, 2) the development there of different approaches to landscape utilization, and 3) the development of different economic activities between people in the five ethnic groups. Because of cultural similarities between neighboring agricultural ethnic groups, it is impossible to correlate cultural traits with concepts of occupancy brought by the ancestors of a particular ethnic group. Among the pastoral Todas there are presently no proven correlations between cultural traits and concepts of occupancy brought by ancestors. However, when the spectrum of Toda cultural traits is considered, it strongly indicates the perpetuation of such concepts. By having an economy based on the herding of only buffaloes, the Todas are culturally differentiated from their neighbors. Their unique assemblage of barrel-vaulted and front-gabled dwellings, barrel-vaulted and conical dairy-temples, and barrel-vaulted funeral-temples, together with the Toda religious-economic system in which milk from sacred buffaloes is processed in different grades of dairy-temples, suggest the transmittance of cultural traits over a long time period.

By utilizing landscapes in different ways, the Badagas became
the most dynamic of the Nilgiri ethnic groups. In addition to establishing themselves as upper Nilgiri subsistence and small scale commercial agriculturists served by Thoraiyas, they exploited other ecological niches. Some seasonally herd livestock on western upper Nilgiri grasslands, others employ Kasuvas in the Mysore Ditch and there maintain permanent livestock centers, while some who reside in the Nilgiri Wynaad are wet rice cultivators—assisted in some instances by Paniyas. By contrast, the somewhat static Todas only utilize an ecological niche conducive to grassland formation and now live mainly on the north-western upper Nilgiris. Through rearing secular and sacred buffaloes, they have concentrated on the perpetuation of their religious-economic system and sale of clarified butter produced in dwellings and dairy-temples.

Though there are resemblances between their communities and land utilization by upper Nilgiri Badagas and Kotas, the income derived from Kotas working as basket makers, blacksmiths, carpenters, musicians, and potters has caused this group to economically vary from the Badagas. A major difference between Irulas and Kurumbas is based on Kurumbas functioning as the traditional doctors and sorcerers of the Nilgiri District.

The main similarities between members of different ethnic groups have existed where people with similar economic activities occupied the same general environment. Likenesses are largely due to borrowing, but environmental influences must also have played a role. In the early 1800s the Irulas and Kurumbas ate garden produce and grain harvested from dry fields, but were forced to seasonally gather and hunt in order
to stay alive. In the same period the upper Nilgiri Badagas and Kotas lived mainly on produce from kitchen gardens and millets from dry fields, but were also alike in that they produced condiments and opium for barter or sale. Furthermore, their villages and even their houses were apparently similar. By following the practices of their neighbors, both Badagas and Kotas in the Nilgiri Wynaad turned to wet rice cultivation in valleys, dry field cultivation on adjacent slopes, and the maintenance of multilayer gardens.

On the upper Nilgiris a few similarities exist among members of different ethnic groups whose economic activities are not similar, but who occupy the same general environment. Thus, the functional arrangement of features within Badaga, Kota, and Toda dwellings are sufficiently alike to indicate the borrowing of ideas. Both the limited practice of horizontal transhumance by Badagas and Todas, and the Badaga dairy-temple center at Bergani, with accompanying herd of sacred buffaloes, indicate borrowing from Todas. A former Kota barrel-vaulted temple resembled a Toda barrel-vaulted structure. Eventually, certain ideas were borrowed and applied by members of all five ethnic groups. Thus, some members of all ethnic groups live in either hamlets or villages, and some live in side-gabled houses built next to each other.

The presence of English colonials from the early 1800s led to changes in the occupance patterns of the five Nilgiri ethnic groups. Through several laws and the Final Land Settlement of 1881-84, whereby people were forced into ownership of taxable acres, the English between 1874 and 1884 ended production of salable or barterable opium and poppy
seeds by Badagas and Kotas, greatly reduced gathering and hunting by
Irulas and Kurumbas, and prohibited any type of shifting agriculture
on land not owned by Badagas, Irulas, Kotas, and Kurumbas. As English-
men established plantations, an ever increasing number of Badagas,
Irulas, and Kurumbas sought employment on them. Introduced plants
adopted by farmers led to some of the most significant changes. Upper
Nilgiri Badagas and Kotas in this century abandoned plows and became
commercial farmers producing potatoes and other "English" vegetables.
Members of both ethnic groups also started growing coffee, tea, temper-
ate berries and fruits, acacias, and eucalypti. The Irulas,
Kurumbas, and Wynnaad Badagas and Kotas planted introduced plants in
their gardens. As to be expected, it was the Badagas who took the
most advantage of new opportunities. Besides becoming the leading
commercial farmers, they educated themselves more than members of
other ethnic groups and are now employed in many outside positions not
related to the plantation industry.

After English administrators departed in 1947, the Madras
Government aided Irulas, Kotas, Kurumbas, and Todas. More substantial
houses have been built for them. Roads have been constructed or im-
proved to facilitate access to their communities. Attempts to reju-
venate Kota trades and to convert Todas into farmers have met with
some success, but attempts to convert old Kurumba trades into money-
making enterprises have failed.

Finally, despite changes since 1800, survival of old ways is
striking. This is illustrated by the following examples: Badaga
houses are built with different materials now, but many apparently
have the same general plan as houses built over a century ago. Though Irulas and Kurumbas were forced to end shifting slash-burn agriculture in the last century, they now shift cultivated plots on land they own. Kotas have lived in only seven villages for over a century. Kurumbas are still feared because of their supposed powers over the supernatural and thereby earn income. Toda occupancy forms and their traditional economy persist after 100 years; Toda barrel-vaulted huts are outwardly identical to those constructed over 350 years ago.
PHOTOGRAPHS
A. Toda male.

B. Toda hamlet (Posh) next to a shola.

C. Calf-huts in the same hamlet.

D. Barrel-vaulted and front-gabled dwelling huts.

E. Hamlet (Perththo) with traditional structures and a new side-gabled house.

F. Hamlet (Pastar) with traditional side-gabled dwellings.
A. Conical dairy-temple (Kanôdrs).

B. Largest barrel-vaulted dairy-temple (Kuudr).

C. Male funeral-temple (Tarâdr).

D. Round entrance and five sculptured Pandavas of the Muini dairy-temple.

E. Toda boy about to place miniature bow and arrow on deceased girl's corpse.

F. Toda male applying butter to sacrificial buffalo's horn.
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A. Badaga Masthi Hethai dairy-temple at Bergani

B. Badagas with Hethai sticks.

C. Bhavani Hundi (in center) and surrounding grassland.

D. Two Badaga shepherds.

E. Badaga – Kasuva livestock center (Denatipatti).

F. Kasuva front-gabled hut (Sokanalli).

G. Kota livestock center near Kirgoj.

Plate III
A. Interfluvial shola.

B. Dendritic shola.

C. Grassland covering valleys.

D. Upland agricultural clearings reverting to shola.

E. Shola removal resulting from Badaga cultivation next to a Toda hamlet.

F. Former field behind the Toda buffalo-pen is now covered with grass regularly cropped by Toda buffaloes.

Plate IV
A. Stone circle built on Anikal Betta by Megalithic Cult members. Blooming *Anaphalis neelgerriana* DC. plants cling to rocky ground and rhododendron at right grows from another stone circle.

B. Frost pocket and patch shola surrounded by lines of planted eucalyptus extending up the side of Deva Betta.

C. More mature eucalyptus trees planted on grassland.

D. Scattered rhododendron trees and patch shola. In the foreground there are *Andropogon polypticus* Steud. var. *decannensis* Bor grass clumps and scattered *Gaultheria fragrantissima* Wall shrubs.

E. Fire racing over savanna on an outer Nilgiri slope.

F. Savanna with tall grasses and scattered charred trees.

Plate V
A. Irula multilayer gardens near Rangaswami Betta are surrounded by dry fields. Savanna resulting from annual fires set by Irulas covers land in the background.

B. Irula house-row fronted by a courtyard (Kardashola).

C. Irula house and courtyard backed by a multilayer garden (Caricure). Covered platform to man's left is used for grain storage. Between house and storeroom roofs there is a chicken basket.

D. Irula houses (Mettikal). One is sided with banana stems and the other is roofed with them.

E. Confinement room with banana stem roofing (Caricure).

F. Irula memorial-temple at Koppayur. Pagoda tree branches show at left.

Plate VI
A. Irula house-row constructed by the Madras Government (Mettikal).

B. Tribal residential school for Irulas at Sholurmattam.

C. Irula field with mixed amaranth (*A. hypochondriacus* L.), Italian millet, and little millet.

D. Irula cattle protected by open-sided hut.

E. Irula sheep within hut on stilts.

F. Officiating Irula priest at Rangaswami Betta.
A. Kurumba male and his two offspring.

B. Kurumba houses next to savanna (Kolikutai).

C. Kurumba houses and a chicken hut (Melur Slope).

D. Kurumba house with courtyard upon which coffee beans were being dried (Melur Slope).

E. Two joined side-gabled Kurumba houses roofed with banana stems (Kavalkombe).

F. Kurumba watch-hut next to a field of Italian and little millet (Kavalkombe).

Plate VIII
A. Scattered fields and Kurumba houses on five different locales (Melur Slope). Note savanna in background.

B. Cherimoya (left), kapok, (farther right), and mandarin orange (right) trees growing near a Kurumba's house (Parthyalam).

C. Kurumba house surrounded by a kitchen garden (Melur Slope).

D. Kurumba kitchen garden (Melur Slope).

E. Field crops grading into a multilayer garden with grains (Parthyalam).

F. Finger millet and scattered amaranth (Kavalkombe).
A. Badaga tea gardens (foreground), dry fields, and eucalyptus stands (middle ground and behind village) near Nunthalla.

B. Badaga Hethai temple at Ketti.

C. Badaga sloped fields with retaining walls and terraced fields under construction. Eucalyptus trees in left background have had most of their leaves removed for eucalyptus oil production.

D. Bulls trampling out little millet grain on a Badaga courtyard.

E. Courtyard at Ketti being decorated on Martu Pongal day.

F. Cow which has just eaten a flatcake presented on the platter.

Plate X
A. Kota Kirgoj community surrounded by kitchen gardens and dry fields.

B. The two Kinar temples.

C. New Kota temples at Kolmel.

D. Dancing Kota women accompanied by men playing instruments (Kinar).

E. Kota musicians playing at a Harvar funeral (Hosatti).

F. Kolmel Kota men working in the village forge.
A. Wynaad terrain, with unplanted wet rice fields on the valley bottom. The Moplah house in the valley is located atypically.

B. Badaga houses next to a courtyard (Nundhatti). A tulasi plant shows in the extreme left.

C. Temple used by Pandalur Badagas.

D. Two shrines adjacent to the same temple. Portions of pagoda trees show to the left and right.

E. Paniya man guiding a plow drawn by buffaloes, and Paniya women transplanting rice.

F. Two Badaga men standing in the midst of a taro plot at Pandalur.

Plate XII
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Tamilians had established a three-part land classification system by 1400 A.D., but it is likely that this system was formulated long before that date. During the period of the Vijayanagan Kingdom, which flourished from 1336 to 1565 A.D. and included virtually all of lower southern India, "the most universal classification of land was after the Tamilian method of dividing it into nans'ey or wet land, puns'ey or dry land, and toppa or groves, orchards and woods" (Saletore 1934, 1: 167). Over Malabar, before and during the reigns of Moslem rulers in the 18th century, land was for tax purposes divided into the same three-fold system of wet fields, dry fields, and gardens as exists today. The typical wet field crop was rice grown in water. Dry field crops were of three types—puttada or modan, punam, and ellu. Puttada crops were cereals and pulses grown on permanent fields, punam crops were cereals and pulses grown on temporary field clearings within forests, and the ellu crop was gingelly (Sesamum indicum L.). In gardens, areca, coconut, pepper, and jack plants were most numerous (Logan 1887, 1: 608-610, 613, 627-701; Innes 1915: 215-221). Buchanan used the three-part system to provide an outstanding description of extreme southern Indian agriculture in 1800-01. As an aid to garden classification, he divided gardens into betel-leaf, coconut or mixed fruit tree, flower, and kitchen gardens (Buchanan 1870, 1: 57-76). The classificatory system used by Buchanan on his trip from Madras, through Malabar, Canara, Mysore State, and back to Madras was so much a part of Dravidian culture that use of any other system would have been a great inconvenience. The three-part system was so satisfactory for land taxation, that later English and Indian administrators made no real effort to institute a new system. The three main divisions forming the system, combined with lesser divisions in the Malabarian dry field crop and Buchanan's garden classifications, were utilized by the writer in establishing a more precise classificatory system for extreme southern Indian agriculture.

In using the system of agricultural classification which follows, one first determines if plants associated with and controlled by men form field crops or gardens. If they form field crops, their association with dry or wet fields is established. If plants form gardens, the plant complexes they make up may be classified according to three types of gardens. Known exceptions not conforming with the general pattern are then covered. Lastly, because garden plants grow in plantations or lesser gardens, the problem of differentiating plantations from other gardens is raised.

Field crops versus gardens. Field crops are grown over clearings, so natural vegetation covering small to large plots is first removed. In field preparation, top soil of an entire field is usually
worked over with hoes, hoe-forks, or plows. However, deep soil turn-over through use of digging-forks or hoes is necessary for a few planted field crops such as potatoes or tapioca. Rice raised in water is grown where soil at depth has been mixed by repeated plowings in water-covered fields. Most plants grown in fields are annuals, and their seeds are often broadcast. Domesticated grasses form typical field crops. One crop may cover a field, but crop mixing is not usual. Thus, barley or wheat are customarily sown separately, but amaranth, Italian millet, little millet, and mustard are frequently sown together. Most plants associated with field agriculture normally grow to heights of less than six feet. Field crops en masse receive different treatment at varying times. Therefore, there are set periods for preparing the soil, planting or sowing, weeding, and harvesting. After the harvest, earth is bared to the sun again.

If land is cleared for garden plants, they will soon cover over a clearing. Thus, well-developed gardens cover the earth well, and it is sometimes difficult to differentiate gardens from nearby forests. Actually, as gardens may blend into forests, transition zones rather than boundaries will then separate gardens from forests. Clearings are usually absent in gardens; those which exist are liable to be small and temporary. Continued growth of wild species among planted plants is sometimes permitted, or even encouraged. Men often allow and even aid spontaneous plant growth originating from chance sprouting of seeds or plant portions which have dropped to earth through gravity and wind, or with inadvertent aid from animals, birds, or men. Garden plants are commonly perennials associated with planting and vegetative propagation. Roots, root sections, and cuttings are planted individually in holes dug in the ground. If seeds are used for propagation, they are liable to be planted. However, seeds are occasionally sown. Dibbles, hoes, and knives are the main garden implements. Plants are commonly mixed, and the garden without peer has a hodgepodge of sun-loving, shade-requiring, and shade- or light-tolerant species. Plants growing above six feet are common and set gardens apart from fields. Species associated with field cultivation may be planted or sown in gardens, but if garden plants growing above six feet are planted in fields, the fields will be converted to gardens. Even sun-loving grains become garden plants when, for example, they are sown between bananas. Climbing creepers, fronds, shrubs, palms, or fruit trees are characteristic garden plants. Because agricultural produce in gardens may come from different levels above ground, the vertical dimension is at times important. As growth habits of garden plants vary greatly, care requirements also vary. In some gardens produce is yielded at different times and even all year around. Shade provided by gardens is cherished by humans benefitting from the shade, and when monsoon winds blow strongly, gardens shield inhabitants in their midst. Many people, therefore, construct their dwellings in the middle of gardens, or plant garden plants around their dwellings.

Dry fields versus wet fields. Dry fields may be permanent or periodically shifted, and are classified accordingly. Crops cultivated on dry fields depend upon rainfall and are raised in close association
with easterly or westerly monsoon rains. Wet fields are almost invari-
ably permanent. Crops raised on them are irrigated with water brought
by canals and ditches running from streams, reservoirs, or wells. Be-
side being raised on dry and irrigated fields, rice is also cultivated
on non-irrigated, leveled wet fields, where water from monsoon rains is
retained behind dikes running around the edges of fields. Much of the
wet rice grown in extreme southern India is raised on non-irrigated wet
fields.

Three garden types. Because a small minority of gardens require
irrigation, gardens are not divided into dry and wet gardens. Areca
palms, in particular, need an abundance of water and are frequently irri-
gated. Cardamom, betel-leaf, and pepper plants may be grown alongside
irrigated areca palms. Bananas and coconuts in drier eastern regions
are also irrigated. It must, therefore, be remembered that some garden
plants are irrigated.

Gardens are divided into the following three types: 1) those
with sun-loving plants forming a single layer, 2) those with shaded
plants forming a single layer, and 3) multilayer gardens with mixtures
of sun-loving, shade-requiring, and shade- or light-tolerant plants.
Unmixed areca, banana, coconut, mango, and rubber plantings are typical
examples of the first type. Any one of the mentioned plants grown in
either plantations or contiguous smaller gardens may cover large acre-
ages. In Malabar, shaded betel-leaf or taro plants are grown within
small gardens under shade provided by coconut gardens. Gardens with
shaded plants forming a single layer may thus be located inside other
gardens. Further examples of gardens with shaded plants forming a
single layer are coffee and tea gardens. Coffee is shaded by natural
trees left standing or a planted species such as albissia (Albissia
chinensis Merr.), and tea is usually shaded by planted silver oaks.
Multilayer gardens with sun-loving, shade-requiring, and shade- or
light-tolerant plants are the commonest garden type, even though they
do not cover the largest acreages. In an example of such a garden, with
plants forming several approximated layers from the ground up, there
may be mixed sweet potatoes, amaranths, edible cannas, giant taros,
coffee shrubs, climbing yams, bananas, mandarin oranges, and jack trees.
Although multilayer gardens yield food, plants producing pretty flowers
are grown in them for aesthetic reasons and ritualistic purposes.
Trees growing in all three types of gardens are sources of firewood and
lumber (jack and mango lumber, for example).

Exceptions. As to be expected, exceptions not conforming with
the outlined classificatory system occur. In temperate mountainous
regions, fruit stands consisting mainly of peaches, pears, and plums
are garden-like. However, in England and on Indian highlands where
Englishmen lived such stands are called orchards. Cultural preference
for a term causes its continued use. Acacias and eucalypti, also
planted in temperate regions, are generally considered to form tree
stands or forests. Existence of a few temperate acacia and tropical
teak plantations poses a problem in classification, for plantations in
extreme southern India are associated with garden agriculture. As acacias grown on plantations for their bark tannin are nurtured more by men and form the basis of annual farm operations, such acacia stands are classified as gardens by the writer. On the other hand, because teak trees grow for a long period before harvesting and receive care normally bestowed upon trees in a well-managed forest, teak on plantations is considered to form timber stands. Sugarcane grown in multilayer gardens is also planted en masse on fields. Even though sugarcane then grows several feet higher than six feet, it is called a field crop. Because domesticated grasses form typical field crops and sugarcane is another domesticated grass, sugarcane forming a field crop cannot be considered so unusual. Flower and kitchen gardens, where bean, grain-like seed, root, and green vegetable producers may be raised, contain plants which do not grow above six feet. These gardens are perhaps best considered as field gardens resulting from crossing between garden and field agriculture. In the two garden types plant species are mixed or grown separately in small plots. Most plants are planted and a great deal of care is sometimes given them, especially by women from houses nearby. Kitchen gardens, in particular, may essentially be women's gardens. As in multilayer gardens, plant growth habits and care required by each species vary. Like field crops, plants are usually annuals, but species variation causes harvest periods to be somewhat different. Lastly, an adequate reason for classifying both types as gardens is that the agriculturists concerned consider them to be gardens and not fields.

Plantations versus lesser gardens. Extreme southern Indian plantations, which are commercial gardens, are largely the result of English capital investments on rural landscapes. So many Indians have taken to raising plantation plants, that the task of establishing criteria for separating plantations from smaller gardens is a difficult one. In the final analysis, field differentiation of certain borderline plantations from lesser gardens will depend upon detailed examination of available data and common sense. The following facts concerning plantations versus lesser gardens, obtained from the 1960 Planting Directory of Southern India, serve as a rough outline pertaining to plantation size range. The leading plantation company (Malayalam Plantations, Ltd.), with over 5,000,000 dollars invested capital, controlled 31 plantations with over 21,000 acres covered by tea and 19,000 acres by rubber. The largest single group of plantations (Kanan Devan Hills Produce Co., Ltd.) within one region (the High Range), having over 4,000,000 dollars invested capital, had a tea acreage of over 25,000 acres on 25 plantations, 21 tea factories, and a managerial staff exceeding 40 men. The largest plantations where the three main plants are grown had 2,751 acres of rubber, 1,650 acres of tea, and 862 acres of coffee respectively. Average acreages covered by gardens with the three plants on the 68 rubber plantations, 115 tea plantations in leading tea regions, and 119 coffee plantations in leading coffee regions were 961 acres, 697 acres, and 304 acres respectively. Assuming company plantations would have representative crop acreages found on efficiently run plantations, these acreages were used to obtain
some idea of minimum plantation size. In the case of rubber and tea acreages, each company plantation also had to have a factory for processing agricultural produce. The same approach would have been used with coffee plantations, but data concerning coffee processing facilities was not given. On this basis, it is estimated that plantations may exist by the time rubber, tea, and coffee acreages reach 300, 200, and 100 acres respectively. At the other end of the spectrum, there are many small gardens. Thirty percent of cardamoms and 60 percent of coffee grown in the Madurai region grew in small gardens. In the central Travancore and Mundakayam region, despite the giant plantations, 59 percent of the rubber acreage was in small gardens. For the Nilgiris, 38 percent coffee and 17 percent tea acreages are similarly listed (United Planters Association of Southern India 1960: 1-417). Because acreages of many smaller gardens were not enumerated, actual percentages of land covered by non-plantation gardens exceed these figures.
APPENDIX B
THE INTRODUCTION AND SPREAD OF PLANTS

**Australian trees.** For purposes of afforestation, beautification, and profits obtained through firewood sales, acacia and eucalyptus species were first introduced into the Nilgiris, and thereby India, during the mid-1800s. Acacias were later planted in large numbers for their bark tannin, and eucalypti became a source of eucalyptus oil extracted from leaves. *Acacia dealbata* F.V.M. and *A. melanoxylon* R. Br. were possibly brought by Dun in the early 1830s. King is also said to have introduced these two species around 1833 (Price 1908: 122). By 1860 both *Acacia mollissima* Willd. and *A. decurrens* Willd. were growing on the Nilgiris (Nair 1953: 34). Near Billakombai, in 1857, the first stand of an imported Australian species, *A. melanoxylon*, was planted by the Madras State Government on four acres of grassland. Through continuous planting this stand was enlarged, so that by late 1859 there were some 200,000 trees consisting mainly of *A. melanoxylon* and another acacia species (not identified), but small numbers of Indian *Cedrus deodara* Loud. and *Pinus longifolia* Roxb. were also grown (Cleghorn 1861: 172, 174, 185). Attempts to grow the two latter species have since been completely abandoned. *A. mollissima* was eventually found to be the most suitable acacia for the Nilgiris and is the one most frequently planted now. In 1834 Cotton grew the first blue gums (*Eucalyptus globulus* Labill.) on the Nilgiris, and in 1856 General Morgan established the first stand of them. After 1857, when sale of blue gums was started at the Ootacamund Botanical Gardens, they became the common, widely distributed eucalyptus species (Hutchins 1883: 1).

**Subtropical and tropical plants.** It is impossible to tell when most foreign subtropical and tropical plants were introduced. Grain amaranth, papaya, and tapioca are three plants which may have spread rapidly after their introduction by Europeans coming to Malabar. As amaranths (also grown in temperate areas) are cultivated in the Himalayas, their use possibly spread northward from the Nilgiris via the Eastern Ghats (Nakao and Sauer 1952-53, 2: 141-146). The bananas, jacks, limes, and mandarin oranges grown by natives in the early 1800s may have been associated with Nilgiri agriculture for a long period (Buchanan 1870, 1: 402; Harkness 1832: 90). Baikie (1834: 36) saw citrons and loquats growing at Dimbhatti and Billical. Spread in the use of some plants initially grown at Burliar and Kalhatti experimental gardens doubtlessly occurred. When Cleghorn visited Thomas' Burliar garden in 1857, he saw allspice (*Pimenta officinalis* L.), cinnamon (*Cinnamomum zeylanicum* Bl.), clove (*Eugenia caryophylata* Thumb.), cacao (*Theobroma cacao* L.), jack, lime, loquat, mangosteen (*Garcinia mangostana* L.), nutmeg (*Myristica fragrans* Houtt.), orange (probably
Citrus reticulata Blanco obtained from natives), passion fruit, peach, pineapple, pummelo, rose apple (Eugenia jambos L.), and vanilla (Vanilla planifolia Andr.) plants (Cleghorn 1857: 303). Markham introduced cherimoyas into India in 1860, when he visited the Kalhatti government branch garden (since abandoned). Several plants growing there were also grown at Burliar, but no others are mentioned (Markham 1862: 372). Cherimoyas are now frequently grown in Irula and Kurumba gardens.

The three main plantation plants. The three most important plantation plants of the Nilgiris are cinchona, coffee, and tea (mainly Cinchona officinalis Hk., C. ledgeriana Moens, C. calisaya Wedd., C. succirubra Pavon and hybrids; Coffea arabica L. and C. canephora Pierre; Camellia sinensis O. Ktze var. sinensis and var. assamica). By 1895 they covered more than 50 percent of the cultivated land in the Nilgiri District, and acreages devoted to the latter two crops have constantly increased since then (Benson 1895: 430).

The cultivation of cinchona was started in 1860, when Sir Clements Markham brought plants and seeds from Peru to the Botanical Gardens, Ootacamund, and thus gave the Nilgiris the distinction of being the original home of cinchona in India (Markham 1862: 572). The stock brought by Markham was supplemented mostly by plants and seeds from his assistants in Peru, seeds from the botanist Pritchett, and exchange of cinchona plants with the Dutch Government in Java. During 1862-63 government cinchona stands were established on three areas and a fourth stand was started in 1868 (Francis 1908: 183-184; Swamy 1953: 21). By 1884 these had become four government plantations with over one million trees covering 2,610 acres of land (Hunter 1886, 10: 316). Private entrepreneurs undertook the cultivation of cinchona, especially in the Wynaad, but a disastrous drop in prices during the 1880s ended a brief boom period (Fletcher 1911: 42). Thus, 10,373 acres of cinchona listed in the 1895 Nilgiri census were either an exaggeration or chiefly in abandoned plantations (Benson 1895: 430). Afterwards, cinchona cultivation and processing remained essentially in the hands of the Madras State Government. By 1960 cinchona trees covered 2,123 acres, a lesser amount than in 1884 (United Planters Association of Southern India 1960: 390).

According to folklore, coffee was first brought from Mecca to India in 1600 by a Moslem pilgrim called Baba-uddin. The Bababudin Hills in Mysore, named after him, were a center of coffee cultivation when the English overcame Tipu Sultan in 1799. During that year the East India Company started an experimental coffee garden at Anjarakandy, near Telicherry. Plants taken from there were planted by Bevan at Manantody, Malabar Wynaad, in 1825 (United Planters Association of Southern India 1960: xxxi-xxxii). Coffee growing may then have spread eastward into the Nilgiri Wynaad. During 1838 Dawson started the first Nilgiri coffee plantation near Coonoor, and two other plantations were opened during 1840 in the Kotagiri area (Athrey 1953: 11). In 1860 Markham noted that there were 100 acres of coffee on Dawson's plantation, but the nearby 200-acre plantation with 250,000 coffee
bushes belonging to Stanes was the largest in the area. The Wynaad was a leading coffee region by 1860, with 7,358 acres under coffee owned by Europeans and 4,028 acres owned by native cultivators (Markham 1862: 373, 376). In 1960 there were 17,158 acres of coffee on the Nilgiris, 8,187 acres in the Nilgiri Wynaad, and 15,119 acres in the Malabar Wynaad (United Planters Association of Southern India 1960: 351, 390).

A step toward tea planting on the Nilgiris was taken in 1832, when Surgeon Christie ordered some tea plants from China. Christie died in the same year, but the plants which arrived were distributed for planting. During 1834 Lord Bentinck, Viceroy of India, sent a commission to China for some tea. A few plants grown from seeds brought back from China were planted in 1835 at Ketti and elsewhere (United Planters Association of Southern India 1960: xxxiii). Fortune, during 1854, brought some tea seeds off recently imported bushes from China and gave the seeds to Henry Mann. The planted seeds formed the nucleus of the first tea plantation near Coonoor, and in 1858 Cleghorn noted the presence of about 2,000 vigorous tea plants on the plantation (Cleghorn 1861: 18). By 1883 there were 78 Nilgiri tea plantations and a total of 3,322 acres of bearing tea (Hunter 1886, 10: 315). In 1960 tea covered 32,781 acres on the Nilgiris and 14,660 acres in the Nilgiri Wynaad (United Planters Association of Southern India 1960: 390). Assam (var. assamica) rather than China (var. sinensis) tea has, during this century, become the dominant type in southern India and the Nilgiris. The importance of this variety was not realized in Bentinck's time.

Temperate crops and trees. John Sullivan started construction of the first Englishman's house on the Nilgiris in 1819. Shortly thereafter he must have initiate the growth of temperate vegetables and fruits at Dimbhatti, near Kotagiri, for John Jones in 1821 wrote that "European vegetables attain to a high degree of perfection retaining all the original flavour and yielding abundance of the first seed. . . . Of European fruits, strawberries, peaches, and apples have been tried" (Price 1908: 124). Sullivan's gardener grew some large potatoes in 1824, and during 1826 Hough saw beets, cabbages, radishes, and turnips grown by the same man (Price 1908: 126). Baikie (1834: 35-36), Jervis (1834: 46), and Mignon (1834: 83) noted these plants: artichoke, asparagus, beet, cabbage, carrot, cauliflower, celery, kidney bean (Phaseolus vulgaris L.), kale, leek, lettuce, parsnip, pea, potato, pumpkin, radish, savoy (type of cabbage), spinach, tomato, and turnip. Baikie recorded that great quantities of high quality potatoes were being grown, while tomatoes were rare. He also saw apple, nectarine, peach, plum trees, and blackberry, raspberry, and strawberry plants. Ford (1851: 39) stated that the Nilgiris had become famous for their potatoes, which, along with beets, cabbages, cauliflower, celery, and peas, were easily obtainable in the market. In 1843 Cotton brought Chinese pears to the Nilgiris upon his return from China, and this fruit is now the most frequently grown temperate fruit on the Nilgiris (Price 1908: 125). Englishmen also introduced grains
and maize. In 1832 barley, oats, and wheat were sown at Ketti (Francis 1908: 203). Sullivan had grown barley, oats, vetches, and wheat, but Indians did not take to the cultivation of oats and vetches (Metz 1864: 152). Robertson (1875: 15, 18, 20) reported that Badagas were growing six-rowed barley, naked European wheat said to have been introduced by Sullivan, and Scotch two-rowed barley brought by Honeywell of the Arven Brewery (founded in 1857). Maize recently brought to the upper Nilgiris was being raised in their kitchen gardens. However, Kurumbas grew maize previously (Shortt 1868: 49). As to whether or not Europeans introduced broad beans (Vicia faba L.) and buckwheat (Fagopyrum sagittatum Gilib.) is debatable. Frequent use of broad beans in Badaga ritual indicates their early presence on the Nilgiris. Buckwheat was flourishing in 1875, and there is no reason why it should not have spread from inner Asia to the Nilgiris long before Englishmen arrived.
APPENDIX C
RECORD OF FIRES AND GRASSLAND FORMATION

Hough 1829: 72-73

... During the dry season, i.e. from December to May, they [Todas] burn the grass, which, in the darkness of the night, presents a grand spectacle, the sides of the entire hill being illuminated at the same time; but it greatly disfigures the scenery by day, as in a few hours a verdant mountain is transformed, in appearance, to a barren, sombre rock. This improves the grass for the buffaloes, making it coarse, and causing it to grow in tufts: but it is hereby rendered unfit for smaller cattle and sheep, of which however the Thodawurs keep none. . . .

Harkness 1832: 62

After nightfall, the scenery around us was grand beyond description. Much of the grass, fern and heather, being frost bitten and withered, the Tudas had taken this opportunity, before the setting-in of the rains, to fire it; and many of the ridges of mountains now presented an undulating and apparently endless line of flame.

Ouchterlony 1848: 56

... The grass upon which they [Todas] pasture their buffaloes is of coarse rank description, fit only for those hardy and powerful animals; but by burning it down, as is their practice, just before the rains set in, when they are about to migrate to another mund, a fine tender young grass, highly nutritious as pasture, has replaced the ashes of the old grass by the time they return to the mund, round which they have set their fires.

King 1870-71: 25

... During the dry season—that is, from the beginning of January to the end of April—they [Todas] are in the habit of setting fire to the grass, with a view of promoting its better growth; another Kaffir custom, and one, moreover, the beautiful effect of which at night will be remembered by all who have ever seen it on so large a scale.
Marshall 1873: 53

... Wherever, in fact, rich soil and a perennial supply of moisture may be found, there are the ever silent woods; for the periods of annual draught are long: the monsoon rain flows quickly off the hard surface of the exposed hills, and the scorched grass containing the young saplings is yearly fired.

Grigg 1880: 10

... It is, however, to be remembered that the present park-like appearance of the higher plateau, with its down and woodlands, is also, in a great measure, due to the annual recurrence of fires which sweep over the hills, burning the grass and outlying shrub and even the smaller sholas, and checking the larger woods in their persistent efforts to extend their domain further along the sides of the valleys.

Jennings 1881: 8-9

The country [between Ootacamund and Nedivattam] is undulating and grassy, bare of timber except in such hollow places as afford the necessary moisture and shelter. In these spots there are lovely groups of trees, and often a delicious undergrowth of ferns—veritable oases in a desert of uninteresting slopes, covered at this season with burnt-up grass...

Morgan 1887, 2: cccxxiii-cccxxxiv

The whole of the Wynaad plateau must have been covered at no very remote period with dense forest, the greater portion of which, more especially in the center of the taluk, has been swept away by the system of cultivation known as "tuckle" or punam in Malabar, leaving a fringe of deciduous teak forest all along the eastern frontier, from whence it extends into the province of Mysore. On the north and west, the steep declivities of the Western Ghats, covered with primeval growth of evergreen forest also escaped destruction.

... They [deciduous forests] are more or less open, and there is little undergrowth, except in one or two tracts where fire has been artificially excluded. Thousands of acres are covered with a growth of coarse grass from 4' to 8' high...

Francis 1908: 212

1.

In the case of the Kundahs and the Downs an exception to the usual forest rules was made, after much discussion, in 1905 in that the annual burning of the grass was permitted. These areas are chiefly of value as great grazing-grounds;
and it was considered that burning was essential to the pro-
duction of the young green grass so desired by the graziers and
did no appreciable harm to the sholas as long as it was done
early in the year while the undergrowth and bracken in and
round them was still green and if precautions were taken to
prevent the fire from spreading to any inflammable growth which
ran up into them.

2.

... On the northern border, next Mysore, large areas are
covered only with coarse elephant grass [unidentified] through
which fierce fires sweep annually, but in places the rather un-
common Shorea Talura grows gregariously... In the ravines
the teak does splendidly, but the forest has suffered in the
past from frequent fires and from indiscriminate felling...

... The forest is of little use for grazing as, the grass
is long and rank. A few local cattle use it and the bullocks
belonging to the numerous carts which ply from Mysore to the
Wynaad and Ootacamund are grazed in it in considerable numbers
on daily permits...

Note: Part two quotation pertains to the Mudamalai Forest covering
easternmost portions of the Nilgiri Wynaad and extending into
the Mysore Ditch. The area is now within the Mudamalai Wild
Life Sanctuary.

Fletcher 1911: 40-43

... Most of these properties [in southeastern Wynaad]
were practically abandoned from the time of their transfer to
the various gold companies, who... took no heed of their
fine coffee.... As a result of this wholesale neglect, the
weeds soon overtopped the coffee, and as these became as dry
as tinder in the hot weather, fire got in when the hills were
burnt according to the annual custom, and the cultivation was
so effectually destroyed that over an area of possibly ten
thousand acres, once covered with fields of glossy, well kept
coffee, not one single tree remains. For mile after mile,
nothing but an interminable sea of dhubbay grass marks the site
of what were smiling estates.... Here and there, on some
commanding hilltop, a lichen-covered chimney rises above the
tangle of lantana—sole relics of the bungalows occupied by
the cheery, hospitable planters in days of yore, when coffee
was king....

... The large cinchona estates in Wynaad shared the same
fate as coffee when the gold mines were on the ascendant.
They were allowed to get higher in weeds, fire crept in, and
completed their destruction.... As I write, one estate of
six hundred acres rises up before me. It was opened in grand
forest, and is now merely a sea of dhubbay grass. This is
burnt off annually, and in April, when the hills are covered
with a fresh crop of grass after the spring showers, the place
forms a veritable paradise for bison [gaur], lying as it does
remote from all other estates and surrounded on three sides by
dense forest.

Lawley and Penny 1914: 218-221

It is only above a certain height that the forest remains
evergreen. Below that line the foliage is deciduous. During
the hot season, when no rains fall for three months, the trees
drop their leaves; the undergrowth becomes sear and dry; the
sap goes down, and nature takes a rest.

Then is the opportunity of the forest incendiary. He fires
the dry vegetation that he may have spaces for planting a little
corn and for a patch or two of fresh grass for his cattle. The
ground only serves for one year, or two at most. Then the
jungle takes possession, a mean thorny jungle that cannot boast
a single tree worthy of the name, and that can only offer a
prolific crop of thorns.

. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .

Seen from the plains the forest-fire is a long thin red
line, ever working its way upward along the length of the
range. It extends for many miles without a break, now blazing
high where it finds fuel, now dying down where it has only
grass to feed it, but never expiring till it has reached its
furthest limit.

Note: This description refers to forest and sections with changed
vegetation below the Droog near Coonoor.

Champion 1935: 141

In the dry season in February-March the grasslands get very
dry and inflammable and the greater part of them are burnt
annually. This has happened as far back as we have any infor-
mation and has unquestionably exerted a very great influence
on the present distribution of the very fine tender evergreen
forest. Burning completely stops regeneration of practically
every tree species except Rhododendron and every fire eats in
a little all along the periphery of the sholas. . . . Graziers
have occupied the plateaux for a very long time and have burnt
the grass for the sake of the early flush of new growth that
follows a fire, and it is unquestionable that the forest occu-
pies a far smaller proportion of the area than it once did.
Ranganathan 1938: 527-528

... Burning the grass is an immemorial custom of the Todas which has been officially recognized and is now being officially regulated. ...

Bor 1938: 608

... I believe that the shola forest is the relict of an evergreen forest climax which has been pushed back to its last stronghold by fire and grazing. The grassland I consider to be a biotic climax rendered stable by firing and grazing and only one more proof of the stability of grassland under such conditions.
VITA

William Allister Noble was born on April 20, 1932, in a mission hospital at Nagercoil, Travancore State, India. He later attended Hebron School and Breeks Memorial School in the Nilgiri District, Madras State. Graduation took place in 1949, after the Senior Cambridge Examination was passed. Upon returning from India, Emory University in Atlanta, Georgia, was first attended. After earning a B.A. degree in geography with history minor at the University of Georgia in 1955, an M.A. degree in geography with sociology minor was earned at the same institution in 1957. Three years of teaching at Longwood College, Farmville, Virginia, was followed by doctoral work at Louisiana State University. From August, 1962, to September, 1963, data for the dissertation were gathered during fieldwork in the Nilgiri District. Then a one year teaching assistantship at Louisiana State University was followed by two years of teaching at Southeastern Louisiana College. In September, 1966, William A. Noble started teaching in the Geography Department at the University of Missouri, Columbia, Missouri.
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Title of Thesis: Cultural Contrasts and Similarities Among Five Ethnic Groups in the Nilgiri District, Madras State, India, 1800–1963

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EXAMINING COMMITTEE:

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Date of Examination:

December 15, 1967