

Thatch Geographies in Liberia: An Introduction



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I wish to express my appreciation to two people who have greatly enriched this note: Gerlinda Rehberg whose German translations unlocked what was otherwise inaccessible to me and Carel Jongkind who has answered numerous botanical questions.

A Note about the Image on the Front Cover

This comes from a postcard in my possession which has not been used but carries a curious February 10, 1949 date stamp on it, which may have been put there by a collector. The card was produced by the Artvue Post Card Company of 225 Fifth Avenue New York.

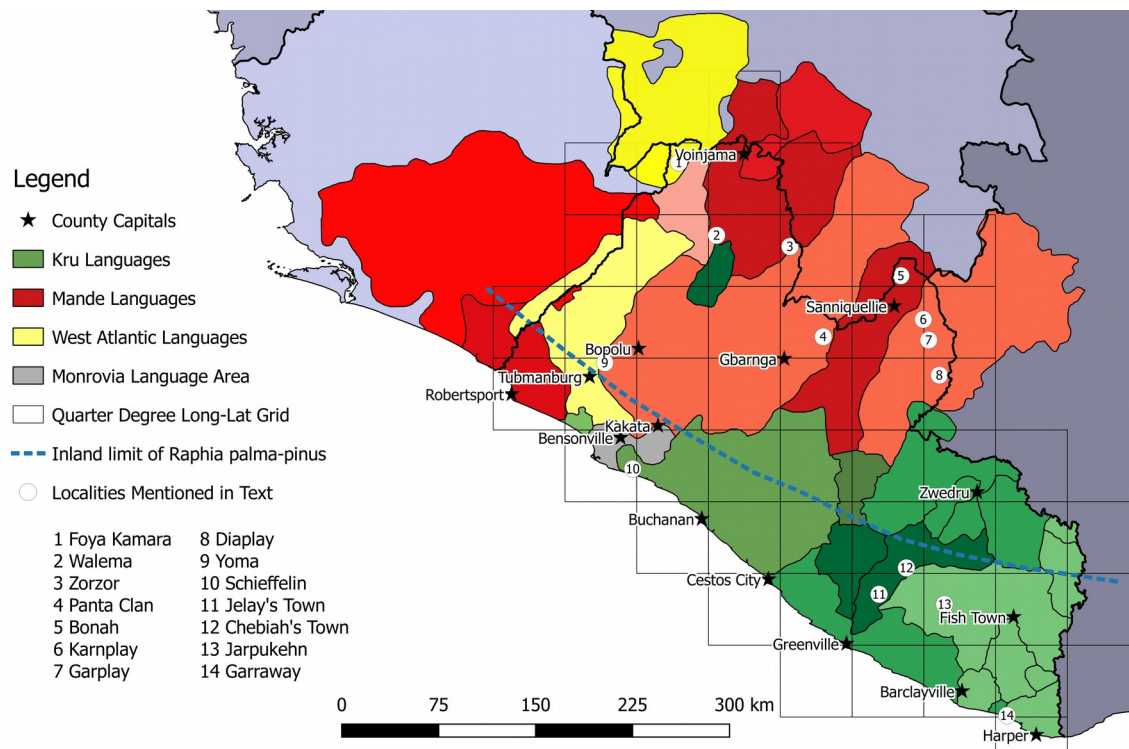
Introduction

Around the world various plants have long been used as roof coverings to provide shelter from the elements, but as a subject of geographical enquiry, the social and environmental factors which shape how they are used as thatch resources have largely been overlooked. As work continues sporadically on a south-east case study, this note will set the scene with a preliminary literature scan to establish what is known about the diversity of thatch materials and techniques across the country. The assembled data will then be reviewed to explore what closer attention to thatch geographies might reveal.

The focus of the literature scan is on thatch materials used for dwellings rather than the wider gamut of shelters they can be used on, such as rice kitchens, smithies and palaver huts. The literature is divided into four sections, with the first covering the small number of works that have taken, or come close to offering, a national overview. Information from more specific localities then follows, split where easily possible, according to language family: Mande, Western Atlantic and Kru. Map 1 shows, with all the weaknesses inherent in such mapping, the distribution of Liberia's indigenous languages and the reader is encouraged to visit the Ethnologue website to understand the data (<https://www.ethnologue.com/country/LR>). I have also included some material from Liberia's neighbours where this refers to populations spanning the borders. Within the four sections, the literature is arranged in historical order unless two or more sources are otherwise logically linked.

Map 1: The Language Families of Liberia & Localities Mentioned

Source: Languages traced from (Lewis *et al.* 2016) and *Raphia palma-pinus* line from (Russell, 1965)



National Overviews

Johnston, H. (1906) *Liberia* (Vol. 2). London: Hutchinson & Co.

Harry Johnston's experience of Liberia, which started in 1882 was sporadic but he gratefully acknowledges the contribution of several people in his work. He ineloquently expresses a simplified summary of the different thatch materials used across Liberia as follows:

P. 1004: "The roof, of course, is a framework of sticks or poles (very often the midribs of raphia palms) thatched with palm fronds, banana or other leaves, grass or reeds according to the district. In the forest region, of course, the thatch is nearly invariably of palm fronds or big leaves."

Schwab, G. (1947) *Tribes of the Liberian Hinterland. Report of the Peabody Museum Expedition to Liberia*. Edited and with additional material by George W. Harley. Cambridge, MA: Peabody Museum.

George Schwab's publication reports on the findings of the expedition that he and his wife undertook in 1928. Though in-country for over 7 months, the author reports that excluding 92 days of internal travel, they only spent 75 days among the nine ethnic groups reported on—17 of which were occupied in trying to measure people! In the introduction Schwab admits he had problems obtaining reliable information from people, though this is not evident in the style of presentation. Despite the subtitle, George W. Harley apparently contributed substantially to the work and according to his wife was disappointed not to be listed as a second author (Harley, 1973: 68). Harley was a medical missionary who resided at Ganta from 1925-1960 and is responsible for the strong Mano bias in this book.

P. 37-8: "The ends of mature raffia fronds (*dā* Mano) are in general used for thatch throughout Liberia. In the raffia swamps the fronds are cut and then cured. Immature fronds will be eaten by the roaches more readily than old ones. They are laid flat in layers until partly dry. If put on too green the leaflets will curl in the sun and the roof will leak. When it is ready the thatch is tied to the horizontal withes in rows of bundles, three or four fronds to a bundle. Beginning at the bottom, each row overlaps the one below exactly as do shingles. In tying the lower rows the men squat on the cross pieces and tie the thatch below them, but as they near the top they make a sort of boatswain's chair that is tied to a peg; the peg is fitted across underneath two rafters, the crossbar of the "chair" lying on the thatch already tied. The man squats on the bar and ties more thatch above himself.

In far northern localities where raffia is scarce, a grass is used called *mwi* in Mano. It grows in exposed, sandy places and on rock ledges with scanty soil. Sometimes the leaves of the *sa:lā* (*Thaumatococcus daniellii*) are also used. (Mano.) A house may have two or even three kinds of material in its roof if materials are hard to get. At the apex the rafter ends are frequently bound to a round billet a few feet long, the upper end of which is left projecting a foot or more. The final bit of thatching here is done by especially clever men, since much skill is required to prevent rain from penetrating at this point. The frond ends are bound about the projecting end of the billet and a sort of matwork woven around and over them. For a roof cap, an old clay pot or a useless old bucket is sometimes on top of the projecting end of the billet. It is more difficult to make the roof cap of the elliptical hut weatherproof. The thatch is put on very thick and doubled over the ridge, finally laced

down with vines, or weighted with heavy mats made of midribs and vines.”

P. 410-11: “One of our Mano interpreters told of a medicine horn that was formerly laid in the space before the hut for protection when a thunderstorm comes up. Another method of protecting a house is to stick up a bunch of green leaves in the thatch above the door....

While we were at Zorzor (Loma), lightning struck a house on the edge of the town. As it was facing us, we could see the house plainly from our own on the Mission grounds. Almost instantly, the locality swarmed with men who began pulling down the roof thatch and throwing it over the stockade. Fortunately, it was raining heavily at the time, so the danger to adjoining huts was at a minimum. We could not understand why the men continued their work of demolishing and throwing the debris outside the town after the fire had been extinguished; nor why two fires had been made, one near the stockade, the other near the fence surrounding the cult leader’s enclosure. Inquiry brought out the fact that it was necessary to destroy all material of which that hut had been made in order to prevent any of it from being used in building a new one. If the old material was used in the new house, it also would be struck. The Sapā have the same superstition and custom. They carry all remaining material from such a hut into the forest and burn it there.”

Moore, B. T. (1964) "Style and construction of Liberian indigenous huts." *Liberian Education Review* 3(1)

Not yet located, but potentially a rich source by Liberia’s distinguished poet-folk historian.

Zetterström, K. (1970) *House and Settlement in Liberia*. Robertspport: Tubman Center of African Culture.

Kjell wrote this hard to find report after his fieldwork among the northern Mano (1974—see later), Kru (1969—see later) and Sapo. Though not explicitly helpful on thatch, it has a useful discussion on settlement patterns, which can presumably have a bearing on thatch exploitation. I will reproduce only the opening line, in order to show how much updating it requires (p. 4): “Whereas house types have changed practically everywhere, the old settlement patterns remain almost in tact.” Apart from some snippets which will be quoted later under their specific ethno-linguistic groups, the following generalisations are useful:

P. 13: “It is no longer possible to talk about, for example, the typical Vai house, other than in the past tense, for styles have changed everywhere. It is an almost impossible task to account for all the different styles even within a single tribe”

P. 25: “Zinc roofs are also being adopted more and more, since they do not have to be changed so often. A thatched roof, depending on its quality, will last for 3-5 years. Its durability is also shortened by another blessing of civilization, namely, the kerosene-stove. This was stated by a Kru informant who complained that since his wife had begun cooking on a kerosene-stove, he had to change his roof more often. The smoke from an open fire, filtering through- the thatch, drives away the insects and thus helps to preserve it.”

Massing, A. (1972) "Rural House Types". Pp 58-60 in von Gnielinski, S. (ed.) *Liberia in Maps: Graphic Perspectives of a Developing Country*. London: University of London Press.

This publication, like the following, is in a style offering only short geographical summaries in the one tribe one style approach dismissed by Zetterström but nonetheless helps paint a national thatch overview. I have converted the house-type by ethnic group table in the original into a simpler list.

P. 58: "The common house type for all interior tribes was the circular house...The roofs are covered with raffia-palm leaves or grass, the eaves differing in length according to area.....A more recent type is the rectangular house with hip-roof...The hip-roof consists of grass or palm leaves, the eaves extending over the edge of the platform which projects about 3ft. (1 m.) from the walls. The pitch of the roofs varies with the area: the traditional Kru-style house has a rather steep roof.....Although the traditional house types still co-exist, with the modern ones, once in decay they will be replaced by more spacious, zinc-roofed house. Only the Gio (Dan) are still building large circular houses with steep, high-pitched conical thatched roof even in the larger villages along the highways."

Round, thatch: Gola, (Grebo), Gio, Belle, Gbande & Kissi

Square, thatch: Vai, Kru, Grebo, Krahn, Mano, Kpelle, Loma, Belle & Mende

Square, zinc: De, Bassa & Mandingo

Schulze, W. (1973) *A New Geography of Liberia*. Harlow: Longman.

P. 90: "The most characteristic building in the interior villages is still the conical hut made of sticks plastered with clay and with a thatch roof, preferably of raphia palm; only in the northern parts is grass put on the thatch base or used exclusively, for example, in the Kissi and in the Loma countries."

Mande Languages Area

Westermann, D. H. (1921) *Die Kpelle, ein Negerstamm in Liberia*. Göttingen/Leipzig: Vandenhoeck und Reprecht/J. C. Hinrichs'sche Buchhandlung.

The Lutheran Church in America invited the linguist, anthropologist and missionary Dr. Dietrich Westermann to analyse the Kpelle language. From September 1914 to January 1915 he conducted fieldwork in Fuamah District, lower Bong County, along the St. Paul River.

P. 39: “Die Bedachung besteht aus Wedeln der Öl-, Raphiaoder Rotangpalme oder anderen großen Baumblättern. Sie ist meist sauber gearbeitet und hat oft einen aus dem gleichen Material hergestellten kegelförmigen Aufsatz. Das kunstgerechte Aufbinden der Blätter auf das Dach erfordert besondere Geschicklichkeit. Als hervorragend haltbar gilt die als ‚Kongodach‘ bekannte Form, die von den an der Küste angesessenen Nachkommen befreiter ‚Kongosklaven‘ stammt.”

The roofs are made of fronds of the oil, raphia and rattan palms or other large tree leaves. The workmanship is precise; the roof has a cone-shaped structure on top made from the same materials. The artful threading of the leaves onto the roof demands particular dexterity. Particular longevity is associated with the form known as ‘Congo Roof’, since it was originally developed by the coast dwelling descendants of liberated ex ‘Congo slaves’.

The Congo thatching technique exchange references a specific sub-section of the settler population made up of recaptured Africans who had been intercepted on slave vessels by the U.S. navy before being brought to Liberia. These people were called “Congoes” since many originated from the Congo river basin (van der Kraaij, 1983: 15). Sawyer (1992: 115) notes they occupied the lowest stratum of settler society and were “settled in special frontier settlements on the fringes of territory occupied by the New World settlers or in expansions to already existing upriver settlements”. Many lived near the Lutheran missionary station at Muhlenberg, near the rapids on the St. Paul River (Shick, 1980: 70). Though it is unfortunate that Westermann doesn’t elaborate any further on what this thatch looked like, it is tempting to think it may be the same as in the photograph shown over. This was taken in a Congo village in Montserrado County in July, 1926 by Loring Whitman during the Harvard African expedition.

"Congo Town thatched house with inhabitants, Liberia"

Source <http://liberianhistory.org/items/show/2716>



Gibbs, J. L. (1965) "The Kpelle of Liberia." Pages 197-240 in *Peoples of Africa*. Edited by Gibbs, J. L. New York: Holt, Rinehart & Winston.

The Kpelle live in a large part of central Liberia and into Guinea Forestière and consequently thatching practises are likely to vary across their area. According to Bledsoe (1980: 88), Gibbs worked in Panta Chiefdom, which is in eastern Bong County.

P. 208: "The roof has a similar framework thatched with leaves of the oil palm or piassava. Men build and keep in repair the framework and roof; women, the walls. The traditional round, windowless house has in most towns been largely replaced by a rectangular structure divided into quarters to form three rooms and a porch."

Mengrelis, T. (1963) "Esquisse sur l'Habitat Guerzé." *Africa* 33(1): 45-53.

Illustrative of difference in thatching materials used among the Kpelle, Mengrelis provides the following information from Guinea, where they are called Guerzé.

P. 48-9: «Les gens de la Forêt ont l'habitude de couvrir leurs cases avec trois sortes de paille: la très fine (*pipila*), la fine (*dê*) et la grosse (*kean*). La paille est récoltée à une certaine distance du village et, attachée en bottes coniques, transportée, comme toute chose, sur la tête. Les feuilles de palmiers à raphia sont aussi utilisées comme couverture des cases.»

"The people of the forest cover their huts with three kinds of straw: very fine (*pipila*), fine (*dê*) and thick (*kean*). The straw is harvested at a certain distance from the village and tied in conical bundles, carried, like everything else, on the head. The leaves of raffia palms are also used to cover huts."

Germann, P. (1933) *Die Völkerstämme in Norden von Liberia*. Leipzig: R. Voightländers Verlag.

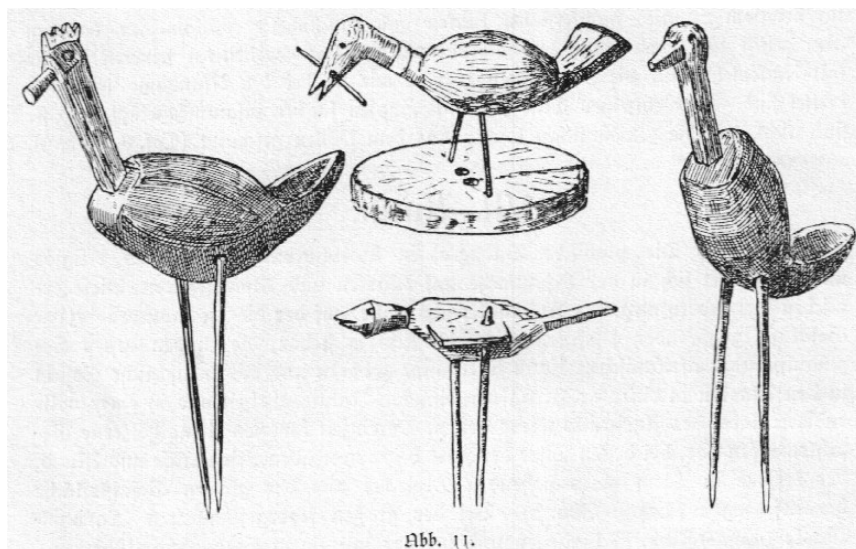
Paul Germann's work, printed in Gothic script, is based on three months fieldwork in 1928-29, during which he was obliged to collect ethological material for his sponsors, the Saxon State Research Institute for Ethnology at Leipzig (Herzog, 1935). His work focused on the Gbande, Loma—who he refers to as Buzi—and to a certain extent the Western-Atlantic language speaking Kissi. Westermann's earlier work among the Kpelle—see later—is apparently followed rather closely, to the extent that Herzog (*ibid.*) was uncertain whether he was quoting it or matching his data to it¹. Herzog does however praise his sections dealing with material culture and techniques, from which the following data about thatch are obtained on page 30:

Man nimmt zum Decken des Daches, je nachdem das Material vorhanden und bequem zu beschaffen ist, die Wedel der Öl- oder Raphia-Palme. Das Festbinden der Blätter erfordert eine besondere Fertigkeit, da nur bei gleichmäßiger Dicke und fester Lage des Materials das Dach den schweren Regengüssen für längere Zeit Widerstand leisten kann. Ein mit den Wedeln der Ölpalme gedecktes Dach hält in der Regel nur etwa 5 Jahre dicht und muß nach dieser Zeit erneuert werden. Wesentlich dauerhafter sind die Wedel der Raphia-Palme, aber als bestes Deckmaterial gilt Gras. Dieses wird an einem langen Seil in Büscheln verknötet, und danach führt man das wie ein endlos langer Schurz aussehende Seil von unten nach oben in Spiralen um das kegelförmige Dachlattengerüst herum bis man die Spitze erreicht hat. Es gilt nun an dieser Stelle einen dichten Abschluß herzustellen, der verhindert, daß das Regenwasser durch die undichte Spitze in den Dachbelag eindringen kann. Man löst dieses Problem am einfachsten indem man über die Spitze einen großen

1 Zetterström (1970: 16) does the same, seemingly borrowing from Westermann verbatim, without reference, regarding the use of carved wooden birds on roofs by the Loma.

umgekehrten Tontopf stülpt, an dessen Wänden das Regenwasser abgoleitet und auf die schräge Dachfläche gelangt. In anderen Fällen hilft man sich damit, daß man auf die Dachspitze noch eine Art Miniaturhüttchen setzt, dessen kleines Dach die erste Wucht der Regentropfen auffängt und ableitet. Sind auf dem Dach hölzerne Dachvögel angebracht, so stehen diese häufig auf einer runden Holzplatte, die demselben Zwecke dient. Über die Bedeutung dieser auf den Dächern stehenden hölzernen Vögel (Abb. 11) habe ich keine eindeutigen Angaben bekommen. Man findet sie verhältnismäßig häufig im Buzilande, seltener bei den Gbande. Auf jeden Fall gelten sie als Glücksvögel, denn, wie man mir sagte, sollen sie das Haus vor Blitz schützen und Fruchtbarkeit bringen.

“For thatching one uses whatever materials are available, the fronds of oil and raphia palms. The tying down demands particular dexterity, because only a firm structure of even thickness can provide adequate resistance to strong rainfall over long periods of time. A roof thatched with oil palm fronds stays generally water proof for just about five years and needs to be renewed after this period. The fronds of the raffia palm have much greater longevity, but the best thatching material is said to be grass. This is knotted in bunches onto a long rope, and then this rope—which now looks like a super long apron—is led in spirals around the battened framework of the roof structure, upwards and downwards until the top has been reached. It is now important that a watertight closure is constructed, to avoid rainwater penetrating the roof covering from this point. This problem is most easily solved by placing a large earthen ware cooking pot upside down over the top, so the rainwater drains down its sides onto the slopes of the roof. Elsewhere one resorts to adding a kind of secondary, miniature hut on the top, to brace against and to divert the initial impacts of the downpours. Sometimes wooden bird sculptures (Figure 11) are mounted onto round wooden plates for the same purpose. I have not managed to obtain any clear information about the meaning of these wooden birds on the roofs. They are relatively common in Buziland, more rarely among the Gbande. In any respect they are considered bringers of fertility, and harbingers of good luck due to their protective powers against lightning strikes.”



Himmelheber, H. & Himmelheber U. (1958) *Die Dan: Ein Bauernvolk im Westafrikanischen Urwald; Ergebnis drier völkerkundlicher Expeditionen im Hinterlande Liberias, 1949/50, 1952/53, 1955/56*. Stuttgart: W. Kohlhammer Verlag.

The Himmelhebers conducted research in and around Kample (Karnplay), Diaple (Diapley) Gable (Garplay) and then later in Nyor Diaple, near Diapley. The original text and translation below omits additional figure (and page) references that are not shown.

P. 55: "Die Dan wohnen in runden Hütten mit einem auffallend hohen Dach. Die kreierunde Wand ist aus einem Stangengerüst errichtet, das später mit Lehm verschmiert und weiß verputzt wird (Abb. 6a). Über dieses Wandgerüst wird aus den starken Rippen der Raphiapalme eine Decke gelegt. Das Dach sitzt sowohl auf der Wand auf, als auch auf einer niederen Pfostenreihe, die in einem weiteren Kreis um das Haus herumgesetzt ist. Das Dachgerüst wird für sich angefertigt, dann wie ein Hut auf das Stangengerüst der Wand gesetzt und nun erst mit Gras, Palmwedel oder Bitterwurz, einer palmwedelförmigen, im Sumpfe wachsenden Pflanze, gedeckt (Abb. 6b). Jeder dieser Werkstoffe hat seine besonderen guten wie schlechten Eigenschaften: Gras und Bitterwurz sind mehrere Jahre haltbar, machen aber dem Erbauer größere Mühe als die leicht zu beschaffenden und zu verarbeitenden Palmwedel, die aber ihrerseits nur ein Jahr halten. Das Damdecken ist eine besondere Kunst. Es kommt darauf an, das Gras so zu setzen, daß es dauert. Bisweilen ruft man sich einen Kundigen aus einem anderen Dorf. Aum das übrige Bauen versteht nicht jeder gleich gut, doch gibt es keine besonderen Baumeister. Das Haus steht auf einem Lehmsockel, der im französischen Dan-Lande bis zu einem Meter hoch gemacht wird, damit die Regenströme das Haus nicht unterspülen. Man tritt also über eine oder mehrere Stufen ein.....

Manchmal bauen sie jetzt ganz besonders große Hütten - aus dem einzigen Grunde, weil die liberianische Regierung die Familie nach der Zahl ihrer Hütten besteuert: je mehr Familienmitglieder also in einer Hütte Unterkunft finden, desto geringer die Steuer."

p. 56 "In der Mitte der Hütte ist die Feuerstelle.....Unser Hygrometer zeigte auch während der Trockenzeit über 90 % Feuchtigkeitsgrade. Aus diesem Grunde glüht das Feuer fast ununterbrochen. Die Hütte ist infolgedessen schwarz verrußt. Aber auch das scheint einen Vorteil zu haben: es hält das Ungeziefer fern, vor allem die Kakerlaken. In neuen Hütten wimmelt es davon.....

Dieses Dauerfeuer bedingt eine Bau-Eigentümlichkeit des Dan-Hauses: das übermäßig hoch erscheinende Daro. Der Rauch hat bei der offenen Feuerstelle keinen besonderen Abzug; er zieht nach oben und filtert langsam durch das Grasdach ins Freie, so daß der Europäer, der zum ersten Male in ein Dan-Dorf kommt, meint, es sei da und dort Feuer ausgebrochen. Je größer die Darofläche ist, die für das Durchsickern des Rauches zur Verfügung steht, desto besser zieht er ab. Die eingezogene Decke im Dan-Haus mag den Vorteil haben, die Funken vom Grasdach abzuhalten. In der Trockenzeit allerdings werden die Feuer im Dorf erst nach Sonnenuntergang angezündet."



Abb. 6A: Hausgerüst. Das Dach wird mit Gras oder mit Palmblättern gedeckt, die Wände werden mit Lehm beworfen

Fig. 6A: House scaffolding. The roof is thatched with grass or palm leaves, the walls are daubed with mud.

P. 55 “The Dan live in round huts with distinctive high roofs. The circular walls are constructed from pole scaffolding which is then daubed with mud and plastered white. A roof made from the strong ridges of the raffia palm is then laid above this wall construction (Fig. 6A). The roof is supported by the wall as well as by a lower row of posts which are positioned in a wider circle around the house. The roof scaffolding is constructed individually, then placed on top of the wall scaffolding like a hat, and only afterwards thatched with grass, palm leaves or bitter-root, a palm-leaf-shaped bog plant (Fig. 6b). Each of these construction materials has its own positive, as well as negative properties: grass and bitter-root last for several years, but are more cumbersome building materials than palm leaves which are both easily obtainable and usable but, for their part, only last a year. Roofing is a particular craft. It is important to arrange the grass in a sustainable manner. At times experts are called from other villages. Building, in general, is not equally understood by all, however, there are no especial master builders.....

Now they occasionally build particularly large huts, for the sole reason that the Liberian government taxes each family according to the number of their huts; which means the more family members can be accommodated in one hut, the lower the tax.”

P. 56 “In the centre of the hut is the fire pit..... Our hygrometer showed over 90% humidity even during the dry season. This is why the fire is kept glowing almost continuously. As a result, the hut is soot-blackened. However, that seems to have its

advantage: it keeps pests at bay, especially cockroaches. New huts are teeming with them.....

This permanent fire calls for a particular construction aspect of Dan houses: the roof seems substantially higher than average. There is no specific vent for the smoke from the open fire, it draws upwards and filters slowly through the grass roof into the open air, so that Europeans who enter a Dan village for the first time, assume that fires have broken out here and there. Smoke extraction works better, the larger the roof surface, to allow for the smoke to penetrate outwards. The threaded ceilings of Dan villages may have the advantage of keeping the sparks off the grass roof. During the dry period, however, fires in the village are only lit after sunset.”



Abb. 6B: Dadldecken. Palmblätter sind leichtter zu verarbeiten als Gras, aber weniger haltbar.
Fig. 6B: Thatching. Palm leaves are easier to work with than grass, but are less durable.

Zetterström, K. (1976) *The Yamein Mano of Northern Liberia*. Uppsala: Almqvist & Wiksell.

Kjell Zetterström conducted research in Yarmein from 1967-70 and was based for some of this period in the town of Bonah (Bonlah). There is a curious contraction between what he says and illustrates here about thatch material and what he said in his 1970 publication (page 18) “the most common material being palm leaves.” Were thatching practises in flux?

P. 35-6: “The roof is cone-shaped and about 5 m high, it ends about 1 m above the ground and protrudes around 1 m from the wall, thus forming a shady place.

The roof is built in the following way. Rafters are placed on top of the wall and are tied together, forming a cone-shaped framework resting on the wall. Sticks are applied horizontally to the rafters and tied to these with strings. On this framework are placed bundles of straw or leaves (see picture). These are laid in layers like roofing-tiles with the first layer at the lower end of the roof. At the top, there is usually an inverted bucket to keep the whole construction together. A roof of this type will last 3-5 years. As there is no chimney in the house, the smoke has to pass through the roof, thus giving the inner side a black, shiny colour. Because of the fire and smoke, there are few insects in the roof(1).”

(1) When working with the Kru on the coast I often heard the men complaining that their wives nowadays used to cook on kerosene stoves. These stoves do not produce any or at least very little smoke, and the roofs therefore soon became full of insects which destroyed them in a fairly short time.

p. 37 “The roofs of the older [square] houses are thatched in the same manner as that described for the round house. The roof has four sides, the ridge averaging 1.5-2 m. Over the ridge there is placed a “mat” of raffia-midribs to prevent the top layers from blowing off. The roof protrudes 50-70 cm from the wall and the whole construction attains a height of 5-7 m.”



Dennis, B.G. (1972). *The Gbandes: a People of the Liberian Hinterland*. Chicago: Nelson-Hall.

Though this book was rightly criticised (Currens, 1972-74), Benjamin Dennis provides an interesting description of thatching:

P. 70-1: "By and large, most of the huts are permanent and the thatched roofs are replaced on the average of every eight or ten year. Some new huts are built approximately every four years as the Poro graduates marry. When a new hut is built or thatch is replaced, almost everyone in the village has a part in it and all work together. Most of the huts are round but there are a few rectangular huts. The rectangular huts are fairly new to Gbandeland and are built for paramount chief and other privileged individuals, such as government officials. There is little or no distinction between the hut of a tribal chief, a village chief, a village headman, or a commoner. They are built of similar materials and in a similar fashion."

P. 72-3: "A certain type of smooth grass called *tuhuwe* is used for the thatch roof. This grass grows in a few rocky areas in Gbandeland*. The men cut the blades of grass, pile them, and let them stand at least three days to dry. The blades are then laid side by side in a row, their root ends even. The blades are then tied in small bunches to a long vine fiber with another fibre knotting each on to form a long strand resembling fringe. These strands of thatch are then rolled up and handed to the men on ladders to be unrolled and tied in successive overlapping layers around the roof, beginning at the bottom. The strand for the bottom-most edge of the roof also contains some stiff waxy leaves about ten inches long that form an eave to keep the rain from running down the clay walls of the hut. The blades of grass used for the roof pack together when they become moist and keep the rain out quite effectively.

*Bush cows graze on this grass. During the dry season these patches of grass sometimes catch fire. The Gbandes believe the fires are started when a bush cow scrapes its hooves on the rocks. These fires, however, do not engulf the thick moist forest."

The *tuhuwe* grass described above is perhaps the same as that described by Schwab (1947: 11) when he crossed 'Gbundeland' in 1928:

"Continuing onward from Walema for three-quarters of an hour, we climbed a hill of rock, bare except for patches of the short grass, used for thatch, growing where soil had accumulated."

Western Atlantic Languages Area

Duncan, N. H. (1960) *Family Life in Lofa County: Kissi, Gbandi, Loma, Mandingo, Kpelle*. Sponsored by USAID and the San Francisco State College Team with the cooperation of the Liberian Government and the Monrovia Consolidated School System.

This short, uninspiring report provides the only information so far found on thatching among the Kissi—it doesn't provide any for the other ethnic groups covered in the report. Information was collected in Kpandoni, Mede Goma, Foyah Kamara Airfield, Foco Fayia Quarters Airfield area, and Kpandani. Of these, I have only located Foya Kamara, which is shown on Map 1.

P. 19 “When building a house the men and women had special parts to play. The men cut the sticks and ropes, collected a special type of hill or mountain grass.....The name of the grass used for covering the house was not given but it could last up to twenty years without holes.

Presently, most people depend on the professionals to build their homes. Materials today include zinc, nails, sun-baked mud blocks and planks. A few families still use old methods and materials but the grass for covering is not used.”

To make up for the limited material on this language family, a recent dictionary of the Kisi language (Childs, 2000), which is also spoken in neighbouring parts of Guinea and Sierra Leone (see Map 1), hints at the diversity of thatching materials used with the following vocabulary:

cìèi-pùiyó	house with thatch roofing
fýóḡndó	thatch used on houses (general name)
núḡgóó	thatch which is found on flat rocks*
pàpèí	a grass used for thatch which grows in the forest
wòkòlòó	grass used for thatch, grows where a fire has mistakenly burned an area
yèndèfúyèí	thatch (that burns very easily)

* Burkill (1995: 606) gives the Sierra Leonean Kissi name *nunḡo* for *Afrotrilepis pilosa*, a perennial sedge which grows in thick mats on bare rocks such as inselbergs. About the use of this species he notes (with reference numbers removed):

“The leaves vary from about 10 to 40 cm long and are used in Guinea and in northern Sierra Leone for thatching hut-roofs. Also in northern Sierra Leone in the Mabonto-Bumban area, a plant of this species is put on the top of the main post of each house. This is presumably in a superstitious sense similar to the practice in Upper Cavally of Ivory Coast where the turf is planted on the top of huts to ward off lightning. The English name 'devil grass' from Sierra Leone implies magical attributes.”

Kru Languages Area

McAllister, A. (1895) *A Lone Woman in Africa Six Years on the Kroo Coast*. New York/Cincinnati: Eaton and Mains/Jennings and Pye.

Agnes McAllister worked as a Methodist missionary at Garraway from 1889 to 1894/5. Her publication includes the image shown below on page 254, but note the source² which makes its relevance a little suspect, even though the image fits the description.

P. 227: “The thatch used for roofing often has to be brought a long distance, and always on the head; for the people have no wagons or carts, not even a wheelbarrow, and no roads except narrow footpaths”

P. 258-9: “The leaves for the thatch are large, and when four or five of them are put together they look much like a shingle. They are tied down with the rope. The thatchers begin at the eaves of the roof and work up; and when the top is reached a cap is made for it and securely tied on.

As soon as the roof is completed a fire is built inside the house, and kept burning to smoke and dry the leaf. The house will not last long unless the leaf is thoroughly dried and cured with the smoke. The women on the beach make salt by boiling the sea water in large, flat brass pans; and when a man has put up a new house he often gets two or three of them for a few weeks to boil their salt in it, claiming that the steam from the salt water is good for the roof.”



² This was a missionary magazine, see: <http://guides.library.yale.edu/c.php?g=296315&p=1976887>

de La Rue, S. (1930) *The Land of the Pepper Bird*. New York & London: G. P. Putnam's Sons.

Sydney de la Rue served in Liberia from 1921 to 1928 as Auditor, General Receiver, and Financial Advisor as per the 1912 International Loan Agreement (Farmer, 1991: 3). How widely he travelled in country is unknown, but his observations of the careful placing of folded palm leaves only by the Kru is interesting. This technique sounds identical to what can be seen in the Himmelhebers' photograph 6a above among the Dan, albeit twenty years or so later.

P.198-199: "Native houses vary according to tribal customs. The Krus usually build great square houses with an "A" roof. This has a framework of poles strongly lashed together with vines. The walls are covered with heavily woven mats of rattan, palm or other durable fibre, and every effort is made to weave the light and dark coloured strips into a pleasing design. The roof is generally thatched with folded palm leaves placed like shingles. This type of roof provides a cool dry interior, because when it is sunny, the palm thatch will quickly dry and curl up, permitting the air to pass freely; but it expands and so closely flattens in the wet that it completely keeps out the rain.

Natives farther inland sometimes build square huts, but more usually round or oval ones with a high pitched roof. The walls of these are made of palm fronds roughly woven together with vines to hold them in an upright position. This interlacing makes a very comfortable hut in the daytime; but it is cold at night. In these huts the thatch is piled on in a mass, and protection from rain depends on the thickness. None of the other tribes have adopted the Krus' accurate and methodical way of placing the palm thatch. For more permanent construction in the villages, the walls of the huts are usually built of wattle, with the mud plastered on until it is one or two feet thick. These better houses have a heavy thatch of fibre laid on after the manner of the straw thatch used in many parts of Europe."

Zetterström, K. (1969) *Ethnographic Survey of Southeastern Liberia: Preliminary Report on the Kru*. Robertsport, Liberia: Tubman Center of African Culture.

Zetterström confirms de La Rue's house shape preference but indicates more diversity in terms of thatching material:

P. 8 "All the houses are rectangular with four-sided roofs with fairly short ridges (in German: Walmdach).....The old type is built on piles, rectangular with walls of woven mats and roofs covered with straw or leaves.....A zinc roof is regarded as a sign of wealth."

Ross, E. (1919) "Climate of Liberia and its effects on man." *Geographical Review* 7(6): 387-402.

Emory Ross served as a missionary with the Disciples of Christ in Liberia from 1913-16 and the article suggests that he was mainly, but not entirely, occupied at the Christian Women's Board of Missions at Schieffelin (Schieffelinsville). This is a Bassa-speaking area only about 30 km east of Monrovia along the Junk river. The article also mentions a three month expedition he undertook to the north-west of the country and he may have travelled or worked elsewhere. Unfortunately no location is given for the impressive photograph on page 397, shown below, entitled, "Native architecture, adapted to the heavy rainfall. The thick thatch roof is brought practically to the ground as a protection to the mud walls."

P.398-399: "The houses, being of mud, are necessarily low and squat and of cramped dimensions so that a thick thatch roof of but medium size and within the power of one man, or of two or three, to make and to renew, will adequately cover it almost down to the ground all around and thus protect the mud walls from the soaking and disintegrating rains. Only the chiefs can afford the labor necessary to thatch and re-thatch, every second or third year, a really roomy house."



Schwab, G. (1947) *Tribes of the Liberian Hinterland. Report of the Peabody Museum Expedition to Liberia*. Edited and with additional material by George W. Harley. Cambridge, MA: Peabody Museum.

P. 41 "For roofing dwellings the Half-Grebo use the raffia "mat" common to central Africa. This is locally known as Congo thatch, because it was introduced by liberated slaves from the Congo who were landed in Liberia"

Whilst Schwab seems to be repeating Westermann's earlier remarks on Congo roofing, it is probably geographically misplaced. So far I have found no evidence for any Congo settlements in the area referred to: a report of a visit to this area in 1898 by four colonists makes no mention of any nearby (Seton, 1899). Other means of a Congo exchange, *sensu* Schwab, are however possible, perhaps especially via missionary stations—da Silva *et al.* (2014: 356) claim that "A disproportionate share of the newcomers worked for and participated in church missions thanks to the US government subsidizing the indentures".

As intimated earlier, Schwab's account needs to be handled with some care and one alternate theory is that members of the local population brought back the technique from the Central African coast. Such a possibility finds favour in the history of migrations of 'Kroumen' down the coast, with McEvoy (1971:54-55) quoting the famous explorer Henry Stanley's reports of scores of Kru labourers at the Banana Point trading factories at the mouth of the Congo River in 1879. Behrens (1974) provides further detailed evidence and Martin (1985) provides a more accessible overview of these migrations.

Genevray, J. (1952) *Éléments d'une Monographie d'une Division Administrative Libérienne (Grand Bassa County)*. Dakar: IFAN.

On the basis of his rainfall data, Dr. Jean Genevray was probably based in Buchanan from August 1946 to April 1948, where he was probably working at the hospital. He has left one of the thicker descriptions on thatch in Liberia. At the beginning of his chapter on l' Habitat, a footnote (page 45) states that the write-up generally follows Richard-Molard's questionnaire, but without a reference. Richard-Molard was a French geographer who died on the Nimba peak in Guinea named after him. His obituary lists a possible reference in a chapter of the *Livre d'Or de l'A.O.F.* but is poorly cited (Blanchard, 1952). I have so far been unable to locate the Kpessé (Kpelle) swamps Genevray refers to. The name Clubine in the footnote refers to Percy Clubine, an English Baptist missionary who translated parts of the bible into Bassa.

P. 48-9 «Dans la confection du toit l'armature ne constitue jamais un grand problème, car les bois ne manquent pas ; il suffit de choisir des tiges de différente grosseur qui vont, en diamètre, de la branche à la brindille. Contrairement à ce qui a été écrit le bambou n'est pas utilisé par les Bassa, du moins pas sur la côte, puisqu'il n'y existe pas. Fabriquer la couverture est beaucoup plus délicat ; aussi y a-t-il une tendance, surtout chez les Kru, à renoncer au toit végétal pour adopter de vieilles tôles rouillées. Il faut en effet des feuilles spéciales larges et denses: presque tout le «thatch» vient de l'intérieur, de la région des swamps Kpessé car les lagunes côtières plus ou moins en communication avec la marée ne possèdent pas la végétation qui convient. Le Bassa a donc recours aux feuilles de piassava (R. vinifera) abondant loin de la côte et à 3 ou 4 espèces [sic] différentes de thatch. Les unes sont extraites de marécages; les autres poussent dans la brousse; ces dernières sont

plus appréciées, car elles sont seules à fournir des toits qui durent plus de 5 ans, mais elles sont peu utilisées sur la côte à cause de leur prix dû à l'éloignement des lieux de pousse. Aussi dans la région de Buchanan on utilise surtout le thatch de marais; il est tout proche, il est gratuit; et bien fumé il est d'une qualité suffisante pour durer de 3 à 5 ans.

Même si le toit est de belle qualité, il reste à rendre étanche son sommet. Quand la maison est rectangulaire avec toit à arête, il est facile de la garnir d'un renfort de palmes et de frondes. Parfois aussi, de plus en plus, on se contente de renforcer l'arête en la couvrant d'un morceau de tôle plié en V renversé. Mais quand la hutte est carrée à sommet ponctiforme, il est fréquent de voir attache du toit renforcées selon le vieux système indigène: un petit toit miniature est juché sur le grand; deux larges fibres souples, incurvées en demis cercle, à concavité inférieure, sont disposées l'une dans un plan frontal, l'autre dans un plan sagittal au sommet du toit. Attachées et ensemble et au toit, couvertes du même thatch que le reste du toit elles assurent son étanchéité.»

p. 51 "Coût moyen d'une case de taille moyenne en 1948. Dans l'intérieur, la dépense est modérée car les matériaux sont bon marché ; sur la côte la recherche d'un bon thatch est onéreuse ; il faut payer aussi les bâtons, les charpentiers, les menuisiers et jusqu'au sol quand on construit près d'un «centre ». En définitive, le long de la mer, seul le mur de termitière est gratuit.

En moyenne les frais sont les suivants :

20 à 30 «bunches» de thatch (chaque bunch, \$ 0.40) \$10.00»

P.104: «Maison civilisée (en tôle) : *zî b̀̀o*.

Case: 1° à toit de feuilles de broussailles: *muà b̀̀o*(1).

2° - - grandes arbres: *kā b̀̀o*.

3° - - Piassava: *cā b̀̀o*. »

(1): Qui devient *bõ* dans certaines secteurs de G,B. Co. (Clubine)

P. 48-9 "In roof making the framework is never a big problem as there is no shortage of wood; it is just a case of choosing stems of different diameters, from the branch to the twig. Contrary to what has been written, bamboo is not used by the Bassa, at least not on the coast since it is not found there. Making the cover is much more delicate, so there is a tendency, especially among the Kru, to give up plant roofing material and adopt rusty old metal sheets. One must have large, dense special leaves: almost all of the "thatch" comes from the interior of the Kpressé swamp region because the coastal lagoons, being more or less tidal, do not have the appropriate vegetation. The Bassa therefore fall back on the leaves of piassava (*R. vinifera*) abundant far from the coast along with 3 or 4 different types of thatch. Some are extracted from marshes and others grow in the bush. The latter are more appreciated because they are the only ones to make roofs that last more than 5 years but they are infrequently used on the coast because of the expense of bringing them from where they grow. So in the Buchanan region, people mainly use swamp thatch, which is found very close, is free and if well smoked, is of sufficient quality to last from 3 to 5 years.

Even if the roof is of good quality, it needs to be made watertight at the top. When the house is rectangular with a ridged roof, it is easy to trim it with a reinforcement of palms and fronds. Sometimes, and increasingly so, the ridge is covered with a piece of sheet metal folded in an inverted V. When the hut is square with a sharp peak, it is frequent to see attached to the roof a means of reinforcement from the old indigenous system: a small miniature roof perched on the big one. This is made of two broad flexible fibers bent in

half circles, attached one over the other at right angles and covered with the same thatch as the rest of the roof in order to ensure its water-proofness."

P. 51 "The average cost of a medium-sized hut in 1948. In the interior, the expenditure is moderate as materials are cheap. On the coast looking for a good thatch is onerous; You also have to pay for the poles, joiners, carpenters and even the ground when you build near a "centre". Ultimately, along the coast, only the termite mound mud walls are free.

On average, the costs are as follows:

20 to 30 "bunches" of thatch (each bunch, \$ 0.40). \$ 10.00 "

P.104: "Civilized house (in sheet metal): *zi b̀̀o*.

A house with (1) A roof of brush leaves: *muà b̀̀o* (see footnote)

(2) A roof of large tree leaves: *k̃̀ b̀̀o*.

(3) A roof of Piassava leaves: *c̃̀ b̀̀o*.

Footnote: This becomes *b̃̀* in certain sectors of Grand Bassa County (Clubine)"

Siegmann, W. (1969) *Report on the Bassa*. Robertsport, Liberia Tubman Center of African Culture.

"P. 10 "The roof is hipped and is quite steep. The roof is the object of particular care because of the heavy rainfall, and it is the ability of the roof to withstand rain which largely determines the lifetime of the house. Roofs are usually thatched with piassava palm fronds or the leaves of a particular species tree (name unknown) when piassava is unavailable."

P.11: "Sheet metal roofs are everywhere in Liberia regarded as a sign of wealth and progress and can be found even in villages five days walk from a motor road. While new houses often have metal roofs, most old houses, and some still under construction, still have thatch roofs."

Voorhoeve, A. G. (1965) *Liberian High Forest Trees*. Wageningen: Pudoc.

A forester comes to our aid in identifying the tree providing the large thatch leaves which Siegmann was unable to name and Genevray noted makes houses called *k̃̀ b̀̀o* in Bassa.

Stachyothyrsus stapfiana (Kahn in Bassa)

P. 212. "USES: The very large leaves are used for thatching roofs. Locally a kind of coppice forest exists which is solely used for the production of large leaves for thatch. The neighbourhood of old town sites may be marked by the presence of pure stands of *Stachyothyrsus* in the secondary bush"

Zetterström, K. (1970) *House and Settlement in Liberia*. Robertsport: Tubman Center of African Culture.

P. 8 "The Belle build round houses with walls of wattle and daub. The roofs are cone-shaped and covered with piassava."

Schröder, G. and Seibel H. D. (1974) *Ethnographic Survey of Southeastern Liberia: The Liberian Kran and the Sapo*. Liberian Studies Monograph Series No. 3. Newark, Delaware.: University of Delaware.

P. 149: "According to all available evidence the original house type among the Kran was round with a conical roof. In recent times rectangular dwellings have come into vogue. The round huts varied in height from ten to twenty feet, with the walls usually around seven feet. The conical roof often reached below the walls and was covered with thatch prepared from local reeds or palm leaves."

Hauenstein, A. (1979) "Le palmier dans les rites et coutumes de certaines populations ivoiriennes." *Genève-Afrique* 17(2): 83-110.

Though Hauenstein's study covers four supposedly Ivoirian ethnic groups, two also live across the Liberian border where they are known by different names. Both get a mention in his section on construction, the Guéré or Krahn and the Yakouba or Dan.

P. 94-6: « La couverture même du toit est généralement faite avec de l'herbe ou des «papo» de raphia. Mais il n'est pas rare que les Guéré ajoutent une couche intermédiaire avec des branches de palmier dont l'extrémité est dirigée vers le bas du toit. C'est une manière de consolider la charpente et aussi d'assurer une plus grande étanchéité. L'herbe est ensuite attachée par-dessus. Selon certains de nos informateurs ce serait là le type idéal de toiture (voir photo 6).

Il existe néanmoins des cas plus rares, où les branches de palmier ne sont pas recouvertes d'herbe; on en met alors plusieurs couches attachées solidement les unes aux autres (voir photo 7). Pour ce type de toiture adopté par les Yakouba, on ajoute au sommet une espèce de grand chapeau protecteur solidement fixé aux branches de palmier qu'un vent violent ne risque pas de les arracher. De nos jours il n'est pas rare qu'un pot dont le fond est percé remplisse ce rôle. »



“The roof cover is usually made with grass or raffia "papo". But it is not uncommon for the Guéré to add an intermediate layer of palm branches, with the ends going towards the base of the roof. It is a way of consolidating the framework and also of ensuring a greater water tightness. The grass is then tied over it. According to some of our informants, this would be the ideal type of roofing (see photo 6).

There are, however, rarer cases, where palm branches are not covered with grass; Several layers are then firmly attached to one another (see photo 7). For this type of roof adopted by the Yakouba, a protective hat is attached to the top, securely fastened to the palm branches so that a violent wind will not detach them. Nowadays it is not uncommon for a pierced pot to fulfil this role.”

Kurtz, R. J. (1985) *Ethnographic Survey of Southeastern Liberia: The Grebo-speaking Peoples*. Liberian Studies Monograph Series No. 7. Philadelphia: Institute for Liberian Studies.

In the last of the four southeastern ethnographic surveys conducted in 1968-69 to be published, an opportunity to examine thatch differences among the 26 predominantly³ Grebo-speaking groups covered has probably been missed by adoption of the blunt coding of Murdock’s (1967) *Ethnographic Atlas* to report the data—unless field notes can be located and prove more accurate. The *Ethnographic Atlas* format has two questions of relevance:

82. Prevailing Type of Dwelling: Shape of Roof

83. Prevailing Type of Dwelling: Roofing Materials

On page 227 of Kurtz’s report, the five code letters labelled questions 80-84 only make sense if they are read as questions 79-83, and a similar error is found on supplementary data for six extra groups presented on page 96. From this, all we learn about the roofs and roofing materials of these 26 groups is:

Shape of Roof: All conical (C) except a hemispherical (H) record for the Glebo and a blank return for the Jidepo

Roofing Materials: All ‘grass, leaves, brush, or other thatch’ (G) except for the Polupo who use mats (M)

3 The Glaro, a We speaking ‘Kran’ group were included in the survey.

Though this all seems rather banal, the exception of the Polupo using mats is potentially interesting when one realises that under the synonyms Padebo or Palepo, they fall among Schwab's aforementioned "Half-Grebo" who were recorded using such mats in 1928. My suspicion is that these mats may refer to the raphia 'papo' mentioned by Hauenstein, which is a panel made of raphia fronds folded and pinned around two stiff raphia petioles. This remains to be verified and as Atolagbe (1996) illustrates for the Yoruba, various styles of roof matting may be used.

Stephens, C. (1988) *Environment and Nutrition Survey Sapo National Park. Situation Analysis for Community Development, February-August 1988*. Monrovia: World Wide Fund for Nature.

Carolyn Stephens conducted research in three study areas around the park, in two Sapo towns, Jelays and Chebiahs, and around the Jedipo Grebo town of Jarpukehn.

P. 28 "Kitchens are variously located. Many families build a separate structure for the kitchen, usually wood and mud walled with thatch roof. The resilience of the building is very important since it acts as storehouse to the rice and dried crops which are kept over the cooking fire. This keeps the crop aired and deters rodents to some extent (stored crop losses can be extensive: one farmer estimated that he can sometimes lose up to 25% of the stored rice harvest to rodents). The fire not only deters animals and dries the crop but the accumulated soot on the ceiling has the effect of 'sealing' the thatch and making the roof more watertight.

For these reasons households with thatched roof dwellings may choose to situate their kitchen in the main building: personal comfort is improved with the increased weather resistance of the roof and the rice crop is kept near at hand in case of pests."

P. 29: "The houses vary in structure and in upkeep: while the common fabric is mud and wood for the walls and universally mud for the floor, roofing material varies. Zinc roofing is the desired fabric of most households - it is watertight, long-lasting, and does not host rodents or insects. The cost of zinc roofing makes it an item accessible only to those with a cash reserve. Even with available cash it is extremely difficult to transport zinc roofing materials into the eastern communities of the region. Its cost and its usefulness have given zinc roofs an additional value of prestige. Unlike the traditional prestige focus, livestock, the possessor of a zinc roofed home is able to display his prosperity and enjoy its benefits....

.....A thatched roof must be replaced or at least repaired every two years. Since the farmer has a busy labour schedule at most times barring the height of the rainy season, the durability of zinc is a big point in its favour. This is particularly relevant since the thatching process is time consuming, and is necessarily done before the rainy slack period in order to use dry materials."

Exploring Thatch Geographies: From the Plant to the Roof

One entry point to reading thatch geographies is to start with the plant selection process: why is a particular plant harvested to fulfil a roofing role? Choices may exist against other specimens of the same species, and relate to factors such as maturity—recall Schwab/Harley referring to the selection of mature raphia fronds—or proximity and resource access rules. The choice may also be weighed up against other species options, or different plants may fulfil different roof functions. Whereas Schwab/Harley relate the use of two or even three kinds of plant materials in the same roof to scarcity of materials, others note an explicit mixture, with different materials used for example on the eaves—as noted by Dennis among the Gbande and Hauenstein among the Guéré (Krahn). Harry Johnston’s simple environmental determinism (species used “according to the district”) overlooks, where there is a range of choice, selection factors such as transport costs. Whilst such costs are perhaps most evident in urban settings, as exemplified by Genevray’s Buchanan account, McAllister reminds us that they may pertain elsewhere. Thatch choices may also be shaped by what the American geographer Gilbert White (1961: 28) has described as “the most elementary form of choice—the reaffirmation of the past”. Are alternate thatching species ignored because tradition favours others? Without a good understanding of the various species used across Liberia and their distribution, this cannot yet be answered. We also have to be mindful, as many of the accounts remind us, that thatching is not an immutable roofing tradition. This will be examined after looking first at thatch species and then thatching practises.

Species Used for Thatching in Liberia

The majority of the reviewed references tend to use common family names rather than identify to the species, which can sometimes cause confusion. To examine the species more closely below, I have maintained the two lay categories commonly used in the accounts, palms and grasses, and created a residual category, other leaves and reeds.

Palm Thatches

Raphias/Piassavas: Genevray is the only author to attempt an identification of the frequently cited raphia thatch, but is mistaken: *Raphia vinifera* is found no closer than southern Benin (Russell, 1965). However, according to Tuley (1994:40) this name was often given in the early literature to *R. hookeri*, which produces wine, unlike the real *R. vinifera* which, despite its beguiling latin, is rarely used for this.

Only two raphia species are found in Liberia, *R. palma-pinus* and *R. hookeri*, with the latter the only wine producer and extending further inland than the former. Russell (*ibid.*) mapped the distributions of these two species at the regional level but I have reproduced only that for *R. palma-pinus* on Map 1, since I have drunk local raphia wine in Liberia much beyond the limit he shows for *R. hookeri*. His distribution limit for the “thatch palm” as *R. palma-pinus* is called in Sierra Leone (*ibid.*) must also be considered tentative.

Genevray’s quasi identification of *R. hookeri* as a thatch material of the Bassa in the 1940s is

fascinating because it may be the least preferred of the two raphias where an equal choice exists. For example, in a study of plant uses just over the border in Sierra Leone, Davies & Richards (1991:33) report; “The preponderant position of *Raphia palma-pinus* as the main local source of roofing material should be noted. It is said to be the most durable⁴ of three palm species (*Elaeis guineensis*, *Raphia hookeri* and *Raphia palma-pinus*) used for thatch.”

As *R. palma-pinus* is more tolerant of salt water and found closer to the coast, why was it seemingly not used for thatch in Buchanan in the 1940s? My suspicion is that it relates to an alternate, though by that time probably declining use of *R. palma-pinus* in the vicinity, namely the export-orientated production of piassava fibre. Tuley (1994) provides a rich account of this trade, noting among other things that the first export of African ‘bass’ came from Grand Bassa in 1889-90, with this area becoming a trade name for material shipped mainly (?) out of Buchanan and that Liberia dominated the world market in the early 20th century. Though both raphias can produce piassava fibres, the suckering habit unique to *R. palma-pinus* is stimulated by cutting, and when done on a regular cycle, permits a higher level of production (*ibid.* p. 41.). As far as I am aware, the extraction and management of piassava in Liberia has never been studied. Though no longer produced, it may in the not so distant past have shaped thatch geographies in certain parts of Liberia. As alternate or parallel uses may influence contemporary raphia thatch choice, closer attention to the species is to be encouraged. Enquiries regarding their local names will often reveal the distinction, at least where they co-exist.

Oil Palm *Elaeis guineensis*. Local oil palm contexts vary significantly across Liberia: in some places high densities of semi-wild trees proliferate whereas in others there may only be a few scattered groves and then, increasingly, there are the settings where planted hybrids dominate the landscape. The use of oil palm thatch needs to be set in the context of its local distribution, tenure and other uses. It will be interesting to learn under what conditions it is ever a principle thatching resource.

Rattans: Included within the family *Palmae* are various multi-use rattan species, of which at least eight are known from Upper Guinea (Sunderland *et al.* 2005). Their use as thatching material whilst not cited in any of the literature examined here, is recorded in one of the best Liberian language dictionaries, that for Kpelle by Leidenfrost & McKay (2007). This distinguishes *láawo laa* rattan leaves, which are good and durable as thatch but thorny from *táme-laa* which are leaves of a type of rattan that grows near water, that is good as thatch. On the basis of these descriptions and reported uses within Sunderland *et al.* (2005) it is tempting to suggest that the former is *Laccosperma secundiflorum*, and the later, with more certainty because of its riparian preferences and similar Mande name, *Calamus deerratus*.

Understory palms: An as yet unidentified species of *Sclerosperma*—see Figure 1 below—is a highly appreciated thatch material around parts of Sapo National Park (Manvell, 2011). Having briefly visited Garraway in 2017 and seen it used there I am almost certain that this is the thatch described there by McAllister’s over a century beforehand. Lebbie *et al.* (2009) provide the only other known mention of the use of this genus for thatching in Liberia at

4 Interestingly however Ouattara *et al.* (2015) indicate that in Ghana, *R. hookeri* petioles are preferred over *R. palma-pinus* as thatch supports because they are more resistant to insect attack. Davies & Richards (1991: 32) nonetheless noted a slightly higher opposite preference in Gola in their category rods and poles.

Zangar in the Marshall wetlands and interestingly note the use of two unidentified species. It is however the material shown in the postcard from an unknown locality that features on the front page of this note. For the specimens seen around Sapo, the botanist Dr. Carel Jongkind suspected they were *S. mannii*, but without fertile parts, could not be sure. In their review of the genus, van Valkenburg *et al.* (2008) describe two Liberian records for this species just east of Monrovia, which are about two thousand kilometres away from the nearest part of their main range (in southeast Nigeria) which extends south into Congo and eastwards to near the Rwanda border. They offer no explanation for this “rather disjunct distribution” but my work around Sapo documents anecdotal evidence that at albeit smaller scales, it’s superior thatching qualities have encouraged the transportation of seeds to new sites.

Figure 1: *Sclerosperma* sp. Used for Thatching near Korjayee, Sinoe



Grass Thatches

All the references gathered so far have avoided identifying the thatch grasses they observed and this is understandable. Nevertheless, species identification would be helpful in better understanding their habitats and distributions in local landscapes, which may be contingent on certain land uses or even plantings⁵. The availability of some grasses may also be closely linked to fire patterns. In the far north, Dennis hints at this among the Gbande as does one of the Kisi names, but it may also be the case in the coastal savannas and patches of geomorphologically derived grasslands. As Fairhead & Leach (1995) have documented among the Kisi over the border in Guinea, fire management regimes are both often misunderstood and subject to change.

To foster thatch grass identification, below is a list of candidate species recorded in Liberia with known thatching uses, though these haven't to my knowledge been documented in-country. These hail from the only known guide to the grasses of the country, albeit of limited geographical coverage, Poilecot (2015), which is available online.

- *Anadelphia leptocoma*
- *Andropogon gayanus*
- *Andropogon macrophyllus*
- *Ctenium newtonii*
- *Eragrostis atrovirens*
- *Hyparrhenia diplandra*
- *Hyparrhenia rufa*
- *Imperata cylindrical*
- *Pennisetum purpureum*

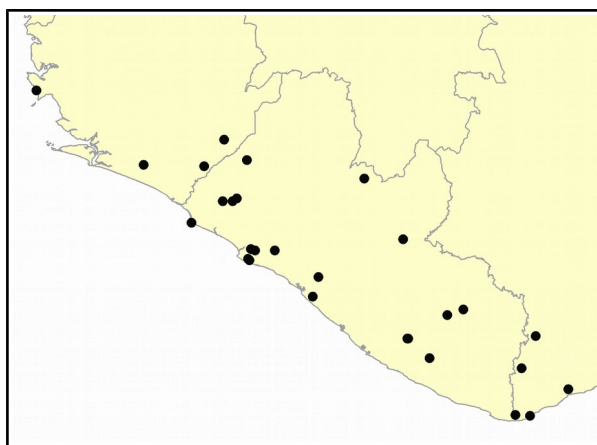
Other Leaves & Reeds

Fortunately we have some identifications for this group of thatch materials. The case of the evergreen tree *Stachyothyrsus stapfiana*, known as *kahn* in Bassa, provides the only direct evidence of active management of thatch resources in Liberia. More details about the contexts of this practise are desirable and it would certainly be interesting to know more about the linkage Siegmann noted between its use and the unavailability of raphias: Which raphias? How are they unavailable and what about other potential thatching species? A Bassa link with the use of this tree for thatch can be seen in the literature scan, but as the map below of most voucher specimens around the world shows, it is more widely distributed. An examination of thatch terms in other languages may reveal a wider use, though other wide-leaved tree leaves may be used. In this regard, it would be very helpful to identify the tree called *goon* in Kpelle whose leaf, *goon laa*, Leidenfrost & McKay (2007: 104) note are “considered the best, most durable material for thatch, but not commonly used, because it is hard to cut in quantities.”

5 On 3rd August, 2017, the Yamein District Commissioner, Hon. Thomas S. Gonolee, told me how his grandfather at Kinnon would take an unidentified grass called *dahn* to their farm village to plant so they could thatch their kitchen.

Map 2: The Distribution of *Stachyothyrsus stapfiana* According to Voucher Specimens

Source: Jongkind (2016)



The perennial erect herb with the super sweet red fruit, often found in dense groups, *Thaumatococcus daniellii*, is found widely in Liberia. Under what conditions it is used as the primary thatching material on dwellings remains to be determined: Schwab/Harley state that it is only sometimes used. In eastern Democratic Republic of Congo (former Zaire), it has been reported as an under-thatch (Yamada, 1984).

Two sources mention the use of reeds for thatching (Johnston and Schröder & Seibel) but provide no further details. The term reed captures a range of grass-like wetland plants. Holmgren, *et al.* (2004) indicate that the sedge *Mapania linderi* is used for thatching in Liberia and a web extract from Burkill (1985)⁶ provides the following further information:

Common names: LIBERIA: *GOLA* pa (AJML) *MANO* suru la (Har.)

Uses: leaf Products: building materials

Description: A robust, fibrous-rooted, almost stemless plant with a crown of leaves to nearly 1 m long by up to 5 cm across, of shaded situations in riverain and montane forest, from Guinea to Ivory Coast. In the Yoma area of Liberia the leaves are reported used for roof-thatching (1).

Reference: 1. Leeuwenberg 4838, K.

More details on the use of this sedge around Yoma, as well as following up the Maawe (Mano) and Gola names to check thatching usage would be helpful. The use of this species for thatch has also been reported from Basse Côte d'Ivoire (Lorougnon, 1972:67) and may be quite widespread. I suspect that the bitter-root mentioned by the Himmelhebers and described as "a palm-leaf shaped bog plant" is a *Mapania*, but there are at least four other species found in Liberia⁷, though this use is only noted for *M. linderi* by Burkill (1985). My reason for this suspicion is that the unidentified *Mapania* shown over (Figure 2), was indicated to me as one of five plants used for thatching in Bonlah (northern Nimba, where Kjell Zetterström worked) along with the remark that it's roots are added to cane juice. In the Maawe dialect spoken here it is called *wey-wo-mah-ley* "monkey (non-specific) tail leaf" and Marshall & Hawthorne (2013) elicited a similar name in the same district for both *M. linderi* and *M. poecilolepi*.

6 http://plants.jstor.org/stable/10.5555/al.ap.upwta.1_1318?searchUri=filter%3Dname%26so%3Dps_group_by_genus_species%26Base%26Query%3DMapania%2Blinderi

7 *M. baldwinii*, *M. ivorensis*, *M. minor* and *M. rhynchocarpa*.

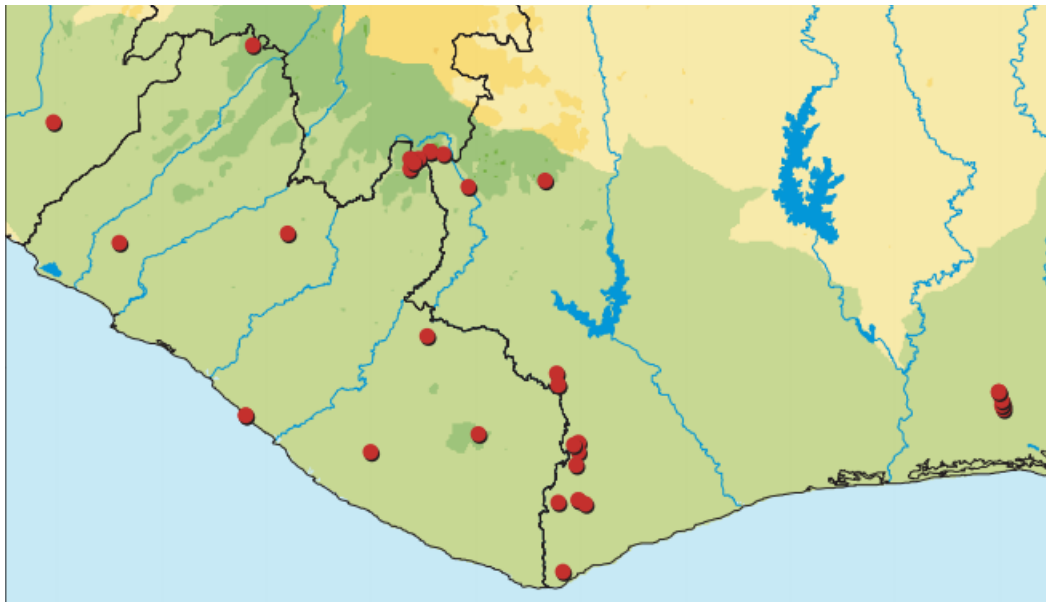
Whether there is a preference for any particular *Mapania* species for thatching is unknown.

Figure 2: *Mapania* sp. Used for Thatching Near Bonlah, Northern Nimba



Map 3: The Distribution of *Mapania linderi* According to Voucher Specimens

Source: Holmgren, *et al.* (2004: 277)



Passing reference has been made to the use of another perennial sedge for thatching (as well as special roof uses), *Afrotrilepis pilosa*, which has a particular distribution linked to bare rocks and especially inselbergs—see Figure 3. Gatter (1997) provides the following details of the distribution of these landforms in Liberia:

P. 29 “The inselbergs of Liberia, a few hundred in number, surrounded by both rainforest and savanna, are isolated to varying degrees. In the extensively

deforested region of northern Lofa County they are separated by only a few kilometres, creating veritable inselberg landscapes. They become increasingly rare towards the southern forest zone, though near the Wonegizi and Kpo Ranges in the west of the country they occur in lines, extending southwards to around 7°N. They are more unusual in the east, where only a few are found south of 6°N and near the coast, where they are in many cases completely covered with forest very similar to that which can be found on the top of isolated inselbergs in savanna.

Some rise to a height of several hundred metres while others are only a few metres above the surrounding country. Inselbergs can be shaped like high domes, their sides steep and inaccessible, but they can also be gentle humps.”

The use of this sedge, which is often mistaken for a grass, for thatching is therefore most likely in northern Lofa, and hence my suspicion that *Afrotrilepis pilosa* is the *tuhuwe* grass of the Gbandes (Dennis) and the special mountain grass of the Kisi (Duncan).

Figure 3: *Afrotrilepis pilosa* on a small, isolated inselberg near Palala, Bong County



Finally Johnston mentions the use of banana leaf thatch. Whilst not unheard of elsewhere in the world, this is not recorded by Abbiw (1990) for Ghana and more documentation of the context of its use as a primary thatching material on dwellings is required.

Thatching Practises

Who thatches?

The scanned literature suggests that thatching is largely an unspecialised male occupation, though Schwab/Harley's reference to 'especially clever men' doing the pinnacle thatch, should be recalled, as should Westermann's need for special dexterity⁸. The social contexts in which thatching is practised are of course variable. Whereas Ross related thatch roof size to differential labour acquiring capacity, Dennis presents an image of mutual thatch help and equal roof sizes among the Gbandes. In a nation-wide study of cooperative labour organisation, Seibel & Massing (1974; 54) note:

"Building cooperatives as found among the Kpelle and Belle may be formed for constructing or thatching the houses of all members in turn. But in most cases such work is done by informal work groups."

For a thatch geography we might also ask where do men who come together to thatch, informally or otherwise, first meet the plant material they will arrange? At the plant? Not necessarily so, since thatch can travel as at least two authors have noted and this may lead to a distinction between harvesters and thatchers. Thatching may involve going to infrequently visited parts of the local landscape to acquire the material, but in other settings it might not. Following thatch from the plant to the roof with an eye on where it is, and who is involved along the way would deepen understanding on how it is exploited, perhaps tended, as a resource, which can sit anywhere along the communal to individual property spectrum.

Thatch Temporalities

Two entwined rhythms are bundled up in thatch geographies, seasonality and the material's life span. The literature hints that thatching is a time-consuming affair: sufficient material may take time to harvest and transport and may also require drying time. Some thatch materials may only be available at certain periods of the year, due to their phenology or their accessibility, e.g. materials found in seasonally inundated habitats. In Guinea and Sierra Leone, Freudenberger *et al.* (1997) document a common property institution that regulates seasonal access to resources such as thatch to ensure they reach maturity before being opened to harvesting. I am unaware of any similar documented cases in Liberia, but it is something to bear in mind, perhaps especially for some grass thatches, and more in relation to protection from fire than from grazing. Access rules however are influenced by factors shaping resource demand and if a plant material loses its primacy as a thatch resource, these may change.

Labour availability and weather conditions are intuitively other important factors influencing the timing of thatching. The sources are however rather mute on this with only Stephens making reference to a seasonal thatching pattern (before the rainy slack period). The Himmelhebers however elsewhere in their work present a seasonal calendar (pages 36-7) which indicates that around the 1950s, January was the time when men mend or build huts. Thatch labour may be subject to different temporalities today.

⁸ Lancy (1996: 64) notes that children in the Kpelle town of Gbarngasuakwelle (Panta District, Bong County) were also involved in thatch preparation, something he observed to be a "truly pleasurable type of work".

From a materials perspective, the effective life span of thatch depends on the qualities of the plant, how they are arranged and the intensity of factors leading to their decay. Several authors provide data, which are united in Table 1. Though the identifications of the thatching material are limited, the longer duration of grasses is interesting to note⁹.

Table 1: Thatch Life Span Estimates

<i>Source</i>	<i>People/Area</i>	<i>Thatch Material</i>	<i>Lifespan (Years)</i>
Stephens, 1988	Sapo National Park	Not stated	2
Genevray, 1952	Buchanan	Marsh thatch	3-5
Zetterström, 1976	Mano, Yamein Clan	Straw & leaves	3-5
Germann, 1933	Gbande, Loma	Oil palm	just about 5
Germann, 1933	Gbande, Loma	Raphia	> 5
Genevray, 1952	Buchanan	Bush thatch	>5
Dennis, 1972	Gbande (Northern Lofa)	<i>tuhuwe</i> grass	8-10
Duncan, 1960	Kisi (Northern Lofa)	Special hill/mountain grass	Up to 20

Schwab/Harley's account of the discarding of thatch struck by lightning reminds us that the assessment of thatch properties may involve other considerations than just keeping out the sun, wind and rain. Several authors also make the point that thatch life is maintained by smoke within the building, which seals or cures the thatch and keeps insects and other animals out of the roof.

Thatch life is intimately tied up with how a house is lived in and a host of factors can cause this to change, both from within, e.g. the change in cooking stoves noted by Zetterström as well as from the outside. In the *long durée* of Liberian history, a constantly occupied house experiencing several cycles of re-thatch may be a rarity and a more unstable norm could have influenced thatch material choices and thatching styles. The population displacements of the recent civil wars are a stark reminder of this. Genevray gives a flavour of this temporality in the 1940s a little later on in his monograph (p. 53-55):

P. 54 «Même quand il existe depuis longtemps sur le même emplacement, le village Bassa se recrée sans cesse; dès que plus de 20 huttes son amalgamées, on en trouve toujours 2 ou 3 en démolition et un nombre égal en construction à quelques mètres des premières. Sur place, également, le village s'enfle et se contracte tour à tour non pas toujours pour des raisons humaines (mortalité et natalité s'équilibrent) ou économiques(1), mais parfois pour des raisons administratives: en effet, la pulsation du village, son rythme d'expansion et de repliement ne sont pas saisonniers; c'est tous les trois ans, au rythme des recensements que les familles s'empilent dans de grandes huttes ou cases en choisissant pour les détruire, celles dont les murs sont lézardés, et dont les toits ployant laissent filtrer la pluie(2).

9 There is little reason to doubt the upper figure of 20 years—Atolagbe (1996) reports elephant grass (*Pennisetum purpureum*) thatch in Nigeria lasting 25 years. This grass is found in Liberia (Poilecot, 2015).

(1) L'étendue des surfaces cultivables en riz, la richesse d'une mare en poisson ont, depuis longtemps attiré le nombre nécessaire et suffisant d'individus, crée un *modus vivendi* tacite et tous comprennent qu'un afflux en masse sur une source de profit fragile et épuisable ne servirait à personne.

(2) Pour éviter la supercherie le Gouvernement libérien fait de plus en plus numéroter les cases.

P. 54 "Even when it has long existed on the same site, the Bassa village is constantly recreating itself; as soon as more than 20 huts are amalgamated, one always find 2 or 3 in demolition and an equal number under construction a few meters away. On the site, too, the village swells and contracts in turn, not only for human reasons (deaths and births equilibrating) or economic⁽¹⁾, but sometimes for administrative reasons: the village's pulsation, its pace of expansion and contracting are not seasonal; every three years, at the rhythm of the census, the families move into the large buildings or huts, choosing to destroy those with cracked walls and sacking roofs that allow the rain to enter.⁽²⁾

(1) The extent of rice-growing areas, the richness of a fish pond, have long attracted the necessary and sufficient number of individuals, which creates a tacit *modus vivendi*, and all understand that a mass influx into a fragile and exhaustible source of profit would serve no one.

(2) In order to avoid fraud, the Liberian Government has increasingly numbered huts.

Thatching Changes

Two roofing changes stand out in the literature examined, shape and material, and whilst at times they have been synchronised, they have probably more often occurred separately. Before looking at these, it is worth briefly dwelling on the lack of data on less obvious shifts in the use of thatching materials. Until case studies on thatching practises at the settlement level are available, it is difficult to judge the ranges of choice people have, and how these may have changed, across Liberia in terms of what plant material to cover their roofs with. Some evidence has been presented in relation to the Buchanan hinterlands to suggest that alternate uses of a thatch species can influence thatch choices and it is likely that shifts in local landuse, fire practises, tenure and labour availability could also colour them. Some basic data on the variable quantities of thatch used in house construction mapped to where it was acquired within a landscape would be an interesting means of revealing the room for manoeuvre people have in how they thatch. Thatching is typically described as an immutable practise, but in all likelihood it has always been subject to variations.

1. The Round to Rectangular House Style Change

Though this architectural change¹⁰ has been something of a fascination to outsider observers, nobody, as far as I am aware, has dwelt on its possible thatch implications. Though the generally described thatching technique of using small bundles of material, sometimes laced into a fringe, laid out like shingles, works on both a curved roof face and a flat one, the house shape shift may also have entailed a more profound change in roof pitches and surface area.

10 I have simplified the shape change: oval, square and mixed shape houses were also involved. On what drove this change, Zetterström (1970: 14-15) provides some evidence that it was not always a voluntary one.

Could a flatter, wider roof area have required a change in thatching style so the roof remains watertight without over-straining the roof beams with heavy thatching? Did a roofing profession start to emerge with the demand¹¹ for more challenging structures? Furthermore, are rectangular houses lived in differently with implications for the thatch? Closer attention to thatching styles in relation to house form and how they are lived in could be interesting. The literature examined here provides few details and the intriguing “Congo” form reported by Westermann and Schwab/Harley is especially minimal. In this regard, Forlacroix (1970: 134) makes the following interesting observation from over the border in Côte d’Ivoire when eliciting information from 19th century photographs from old informants in the localities where they were taken:

“En regardant ces photographies, à propos de tel ou tel détail, un dialogue très instructif peut naître entre en quêteur historien et les vieux notables. Par exemple nous avons pu constater que la méthode de fabrication des toits de *papo* était plus la même autrefois ; aucun jeune était capable expliquer comment étaient faits ces vieux toits ; seuls quelques vieux ont pu montrer les feuilles qui étaient employées et expliquer les procédés de tressage permettant obtenir un résultat comparable celui que on voit sur les photos”

“When looking at these photographs, with regard to this or that detail, a very informative dialogue can come about between the historian and the elders. For example, we noticed that the method of making *papo* roofs was no longer the same; no young person was able to explain how these old roofs were made; only a few old people were able to show the leaves that were used and to explain the weaving methods to obtain a result comparable to the one seen in the photographs.”

2. The Rise of Zinc

Corrugated galvanised iron roofing, known widely in Liberia as zinc, was invented in the 1820s¹². There is a rich geographical story to be told of its arrival and spread across Liberia. The settlers are an important element and it is noteworthy that they had, perhaps from the outset, already eschewed thatch as a roofing material before adopting zinc¹³. Referencing settler architecture at the close of the nineteenth century, Herman (1988: 112-114) notes:

“The exterior siding for houses was generally sawn weatherboard or shingle. Roofs of finished buildings were covered with wood shingle, the walls typically whitewashed or painted. In later years the most popular choice for both roofing and siding was corrugated zinc-covered metal sheeting.”

As a visual statement, Herman later adds:

P. 129: “In settler culture even modest framed houses stood as dramatic counterpoints to circular, mud-walled, and thatched conical-roof dwellings of the native population.”

11 One demand may have come from a desire to reduce hut taxation, as reported by the Himmelhebers.

12 https://en.wikipedia.org/wiki/Corrugated_galvanised_iron. For the record, it should be pointed out that other metal sheets have been used as roofing in Liberia and may pre-date zinc’s arrival: Zetterström (1976: 20) reports the story of one man using flattened brass buckets for this purpose in northern Nimba. These were formerly a common article of trade.

13 The American settlers may have been no different in their roofing choices to other outsiders who established themselves in West Africa.

The spread of zinc is therefore inevitably a story steeped in the multi-faceted complexities of Liberia's history: beyond the mobilities of the material, lie shifting geographies of aspiration as well as the dynamics of the labour and capital to bring it home. Another part of this story is the role of specialised roofing craftsman as indicated in Zetterström's account (1976: 38-9) below, which, as suggested above, may have pre-dated the use of zinc.

"The new houses have roofs of corrugated iron, "zinc roofs", which is bought from the Lebanese stores at \$5 a bundle. Some old houses are now being reroofed with corrugated iron. A zinc roof can amount to well over \$150 before it is finished. The material will cost \$60-100 depending on the size of the roof. The zinc used in Bonah is brought to Lugbeh by car and from there it is carried by hired carriers. The total cost of transportation is from \$20-40. The roofing is made by special craftsmen who receive their pay in cash; for a big house, the cost of labour can amount to some \$40.

Before they start building a new house, a pig is killed and eaten by the embers of the town. Except for the craftsmen laying the roof, anybody who fells like it, will help the owner in building a house without pay."

Early hybrid uses of zinc with thatch, as pointed out by Genevray, are also part of this story. Prestige and durability have been emphasised in the accounts as factors in zinc's rise, but there are doubtless others to consider depending on the setting, e.g. planning rules, perhaps ostensibly to reduce fire¹⁴ or health risks.

Thatching Forsaken?

The assembled material on thatching in Liberia has, I hope, demonstrated how thatch resources and their use may vary in time and space across the land. The scant record covers a period of over 120 years in which thatch has lost its position as the only roofing material in town. Consequently contemporary thatch geographies may be a faint shadow of their former, but probably never fixed selves. Thatch nevertheless remains a widely used resource in rural areas and there are still some interesting geographies to explore.

Figure 4 provides data from the 2008 National Population & Housing Census on main roof construction material of each household enumerated. Among the seven options offered for the roofing material question on the census form, "bamboo, leaves or thatch" covers all plant material options¹⁵, which I have simplified to thatch in Figure 1. The 2008 census was the first, as far as I know¹⁶, to record roof material and hopefully the question will be retained in future rounds. Unfortunately the definitions of rural and urban settings are not provided, but we can see that in certain counties, such as Grand Kru, River Gee and Grand Gedeh, more than half the houses enumerated were thatched in urban areas. The top five counties in terms of

14 Zetterström (1976: 31-32) briefly discusses the rules in Bonah to reduce the risk of fire among the largely thatched, densely spaced houses and Ford (1991: 148) notes "The chance that burning slash might ignite thatch roofs precluded farming near town."

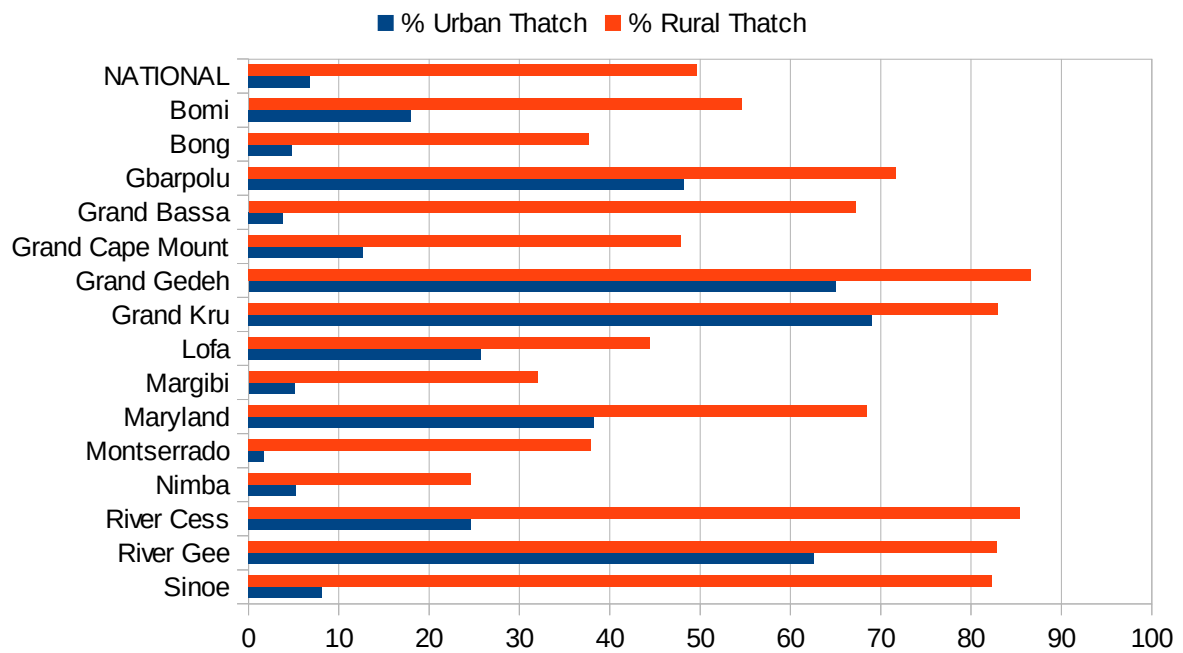
15 The remaining options were: concrete, tiles, asbestos, zinc, tarpaulin and others.

16 The 1974 population & housing census only recorded the construction material of outer walls. The manuscript and most of the data for the 1984 population & housing census went missing during the civil war (LISGIS, 2009). A historical baseline may nevertheless exist in early aerial photography.

highest percentage of thatched rural housing are all in the southeast, where a closer look at thatch geographies will hopefully be presented in the future.

Figure 4: Thatched Roof Percentages in Liberia, March, 2008

Source: Data derived from Table 9.4, LISGIS (2009: Appendix 9, pp. 247-250)



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