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TECHNICAL CHANGE AND SOCIAL RELATIONS IN A WEST AFRICAN MARITIME FISHERY: A DEVELOPMENT HISTORY

by

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PREFACE

This paper is a revised version of a presentation made at the symposium on AFRICA AND THE SEA, convened by the African Studies Group at the University of Aberdeen, Scotland, March 16-17, 1984. The case study contained in this study primarily results from fieldwork carried out in Sierra Leone in 1982. The paper also includes some new archival documentation collected during July/August 1984 in the Public Record Office in Kew Gardens, London, England, and the Church Missionary Society Records stored at the University of Birmingham Library. It, therefore, updates information contained in an earlier ICMRD working paper in this series, entitled "Technology and Tradition in West African Maritime Fisheries: Tombo, Sierra Leone," (ICMRD Working Paper, #8, 83/84-003). My gratitude is hereby acknowledged to Dr. B. S. Benedikz, Curator for the Church Missionary Society Records at the University of Birmingham, for his permission to quote from the Society's papers. The information derived from these records provided much needed definition of the political and socioeconomic changes occurring in Yawri Bay fishing societies during the 19th century, and has thus added to the empirical richness of the research. The paper has also benefitted from readings by Professors J. D. Hargreaves of the University of Aberdeen, African Studies Group, and Christopher Fyfe of the Centre of African Studies, University of Edinburgh, and I am indebted for their commentary.

M. K. H.

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One of the major features of the West African physical environment is the large number of rivers, coastal lagoons and estuaries, inland lakes and swamps, and an extensive marine coastline. Recent paleo-archaeological and historical research have clearly established that an aquatic tradition in western Africa was widespread at a relatively early date (McIntosh and McIntosh, 1983; Andah, 1981; Sutton, 1974). Few historical studies have, however, focused on the marine environment. This paper looks at the historical relationships between technology, production, and socioeconomic development occurring in maritime fishing societies on the Sierra Leone Peninsula from the fifteenth century to about 1980, with a particular emphasis on the village of Tombo, which is situated on the north shores of Yawri Bay to the east of Kent village in the south. (See Map.)

The primary unit of analysis in this discussion is technological change. The basic assumptions made are as follows: (1) what people make in the present is based upon knowledge from past efforts; (2) all people make objects to obtain food; and (3) that technology can serve as a useful guide for determining the changing nature of an occupational group such as fisherfolk.

A NOTE ON TECHNOLOGICAL DEVELOPMENT

A complicated factor in the discussion of technological development in Africa is the notion that technological change remained in an archaic state until the introduction of stimuli and/or more advanced technologies from external sources. Unfortunately, much of the research on material culture has concentrated on the types of materials used for manufacture, rather than production principles related to form and construction. Wendell Oswalt, by contrast, argues that the principles of production are in themselves sufficient for analyzing technological change, explaining that

> Specific production methods and techniques are secondary results of the application of the principles, and materials are significant only in terms of such methods and techniques (1976:211).

More recently, McCulloch and McCulloch advocate for an analysis that takes into account a "complex and mosaic character of technological change in Africa," one in which indigenous innovation and diffusion is not an either/or situation (1983:218). In the context of development generally, Goran Hyden suggests that a "precondition for a self-sustained development process is the generation of an endogenous body of knowledge derived from the local experience (1981:253)." Within the context of technological development, I call this body of knowledge development intellection and define it as an endogenous body of knowledge established over generations from an indigenous experience that can be applied throughout the society in a language that is comprehensible in the context of local production. As Oswalt explains:

> All innovations originate from either the existing techniculture or ideas derived from the natural world. Techniculture includes all knowledge of the methods, principles, and the techniques for making, repairing, or using things, as well as ideas about the things themselves (1976:201).

In short, technology is a corollary of knowledge. It is upon this base that the physical equipment of a culture reflects both the state of technology and its social organization. The study of technological development is complex, and in order for historians to understand the basis for material changes, we must be knowledgeable about the local milieu out of which a particular technology evolves. In this examination of maritime technology, three key factors pertain: an aquatic environment that is potentially productive; an appropriate ethnoicthyology, or knowledge system for classifying and utilizing fish (cf. Pollnac, 1979 and Morrill, 1967); and the capacity to reproduce the vital ingredients that permit the industry to develop (i.e., manpower, means of production, materials, and remuneration).

TOWARDS AN ETHNOICTHYOLOGY OF PENINSULA FISHERFOLK, 1600-1800

From the latter half of the fifteenth century when the Portuguese arrived, identification of marine life in and around the Peninsula was a continual preoccupation. Journalists frequently noted that local diets included crocodile, hippopotamus, manatees, turtles and tortoises, as well as a variety of fish and shellfish. One of the first attempts to visually record marine fishes in the estuary was made by Richard Madox, chaplain on Captain Edward Fenton's 1582 voyage. Madox drew several sketches of marine fauna said to represent the dolphinfish (Coryphaena hippurus), sea urchin, flying fish, porcupine fish, and the Psettus sebae or angle fish, a species of monodactylidae (Taylor, 1959).

In the seventeenth century, Barreira (1606), Finch (1607), and Barbot (1678) together named about thirty species of fish and shellfish,

including oysters, sharks, barracuda, crocodile, sea-horses, manatees, crevallies (Carangidae), rays, wrasses, mullets, sea perch, sea bream, threadfins, guitarfish, spadefish, mackerel, swordfish, garfish, and tarpon (Hair, 1976:65-66; Astley, 1745:308; Barbot, 1678:96-108). All of these fish could be found within the estuary, some of whom migrated from the waters of the continental shelf to feed or breed.

The eighteenth century produced reports by John Atkins (1721) and Dr. Thomas Winterbottom (1803), who between them listed skate, ten-pounders, tarpon, sucking fish, sea bream, mullets, catfish, turtles, wrasses, oysters, mackerel, manatee, alligator, shark, pilot fish, crevallies, snappers, anchovies, electric ray, eels, gobies, and shad (Astley, 1745:316-21; Winterbottom, 1803:68, 90).

Thus, by the end of the nineteenth century over 50 genera of fish and other marine fauna had been named, although the taxonomy was not always precise. When coupled with the lexical material in Table 1, these observations are instructive about the richness of the marine environment around the Peninsula and the relationship of African fisherfolk to it. The purpose of this listing is not to present a complete ethnographic account, but to show the degree of elaboration in the maritime vocabulary of four significant ethnic groupings in the area as an indication of their specialized interests in fishing. These groups are the Mende, Temne, Bullom/Sherbro, and the Creoles.

The process of naming things is one of the most important means that people use to order their environment, and the relationship between

lexical elaboration and specialized cultural interests is well-established in the ethnographic literature (cf. Ehret, 1971; Bliese, 1980; Tyler, 1969; Greenberg, 1964). The word lists in Tables 1 and 2 are derived primarily from limited lexical materials in 19th and early 20th century lexicons compiled between 1812 and 1920. These sources have been augmented where possible with more recent lexical information.

This information suggests that fisherfolk in Sierra Leone have developed a relatively high degree of elaboration in maritime vocabulary in four areas where linguistic differentiation is essential: (1) in fish species; (2) in fish biology; (3) in production instruments, techniques, and activities; and (4) in the marine environment. *Table 1 reveals a basic fish biology, although expressed in general terms, but including fish fins, gills, bladder, and scales. Innes (1969) does list an elaborated term for a fish fin among the Mende, the dorsal fin, which is called ndi hu gaja. Most important, the lexical material contains a differentiated fish taxonomy. Nonetheless, further research must be pursued in order to develop a more viable synchronic description of this material, together with applying a diachronic analysis to detect sources of borrowing and innovation.

*Tables are located at the end of the document.

For the moment, the vocabulary suggests that Peninsula fisherfolk developed an indigenous means of constructing a taxonomic system for classifying the maritime environment. Although the age of this system is not presently understood, the word lists reveal that it was operative for the period under discussion. From more recent synthetic studies, we know that this taxonomy was complex and multi-dimensional, comprising categories for edible and inedible, salt and freshwater, color, shape and size, and so on (Irvine, 1947; Kup, 1962; Kamara, 1973; Hendrix, 1983b). Such information was, of course, vital to fisherfolk for specifically determining the use of various fish species as subsistence or income, as well as the means of production to be utilized in obtaining the species of choice.

TECHNOLOGICAL SYSTEMS OF MARITIME FISH PRODUCTION

As early as 1607, William Finch observed Peninsula fisherfolk taking "much good fish with waves [nets] and other devices" (Astley, 1745:306). Between 1600 and 1800, Sierra Leone fisherfolk were known to employ a variety of different methods in maritime fish production. These methods can be organized under two principal categories - onshore (tended and untended facilities) and canoe-dependent (cf. Table 2). Onshore methods included beachcombing, diving, line fishing, spearing, bow and arrow, various traps and fish fences, fish poisoning, and netting. Canoe fishing required different equipment and strategies, but was usually performed with hook-and-line or one or more of several important nets: drag-nets or beach seines, set nets, drift nets, and cast nets.

Further delineation in fishing practices was based upon gender, with men and women exploiting different terrain and type of catch. Women were mainly involved in beachcombing with children; constructing onshore weirs and fish fences; using dip or scoop nets; and using fish poisons and toxins. Women also utilized naturefacts to make traps, such as leaves to form funnels, which they used to catch jumping fish (Winterbottom, 1803:90). These leap funnel traps were known to the Mende as tola. Beyond these methods, a significant number of basket traps were also employed by women, even though they could be manufactured by men.

Canoe fishing was a culturally prescribed male activity, although women and children could assist in beaching nets. Moreover, men primarily operated the drag nets, set nets, and other large onshore nets. This division of labor predominated among the Bullom and Temne. However, McCulloch informs us that among the Mende men "make weirs and dams, [while] hand net fishing is women's work, and small girls help to make and mend nets" (McCulloch, 1950:11).

The dug-out canoe was the characteristic mode of watercraft among Peninsula fisherfolk. Captain John Hawkins made the following observation concerning Sherbro canoes during his 1564 voyage to Sierra Leone.

> In this island of Sambula [Sherbro], we found about 50 boats, called almadyes, or canoas, which are made of one peece of wood, digged out like a trough, but yet of good proportion, being about 8 yards long, and one in bredth, having a beake head, and sterne very proportionally made, and on the outside artificially carved, and painted red and blewe; they are able to carry 20 to 30 men, but they are about the coast able to carry three score and upwards. In these canoas they rowe standing upright, with an ower somewhat longer than a man...(Markham, 1970:18)

Smaller canoes, of course, were used for the purposes of fishing, and operated by from one to five men. Besides line fishing for large pelagic species, canoe fishermen generally employed the cast net, the drift-net (called yelifunfu by the Creoles), and seines, which are first mentioned at Sierra Leone by John Atkins (Astley, 1745:318). In West Africa, the seine is not indistinguishable from the drag net, except for size. Seines are usually rectangular and designed to envelope fish, while drag nets are designed to hold fish by their gills or by the net's motion through the water, and in West Africa was also rectangular, although in other parts of the world they can be cone-shaped (Oswalt, 1976:122). This is important because credit is often given Europeans for introducing this net type (Kup, 1962:177), although the function and design was already locally based.

These traditional methods of fishing and related technology on the Peninsula were skillful and complex adaptations to the prevailing economic conditions up to 1800. But, following 1800, African societies in the Peninsula environs had to confront the realities of European intervention and deal with the concomitant changes which resulted. Fisherfolk were forced also to adopt new modes of production and acquire new skills and tools. It is within this context that this paper will now examine the historical development of Tombo Village and its fishery, both of which come into existence during the colonial experience.

TECHNOLOGY AND CHANGE IN TOMBO VILLAGE, c1800-1980

The history of the southern area of the Sierra Leone Peninsula is not well-represented in published studies, but from what we can learn

from the several oral histories provided by village elders and the general historical works on Sierra Leone, Tombo was founded and settled sometime around 1800 by Sherbro immigrants. Traditions suggest that they migrated to the Peninsula to escape internecine conflict resulting from a "black man's war" in the Sherbro hinterland. The specific date and nature of this war is not clear, but this may have been the conflict mentioned by Lt. John Matthews in a letter of 1786 in which he noted that a "war in Sherbro arose from a quarrel between two chiefs, and involved the whole country in their dispute" (Matthews, 1788:89). A second possibility is the Caulker-Cleveland War in 1797 in which Chief Stephen Caulker seized the territory from around Cape Shilling, together with the Banana Islands from Bemba (Lord North), and William Cleveland in order to avenge the beheading of Charles Caulker twelve years earlier in 1785 (Fyfe, 1962:81).

During this period, the Sherbro villages in the Peninsula were under the political administration of Chief Stephen Caulker (1797-1810) of the Bumpe Chiefdom. The Caulkers were an Afro-European family who dominated trade and politics for about a century (Fyfe, 1962; Anya, 1973). The immigrants were attracted to the north shores of Yawri Bay not only in quest for a more stable political environment, but also for a viable subsistence food economy other than farming. Anya (1973:3) informs us that Sherbro men preferred hunting and fishing to farming, which they considered menial, slave, and women's work. Furthermore, the north shore of Yawri Bay offered some protection from the slave trade, a sandy, protected beach and harbor, and ample fishing grounds. For sea fishing, fishermen generally used hook-and-line for snapper and other

large fish, or cast nets thrown from Sherbro canoes for smaller species, like shad.

In the late 1830's, Tombo was selected as a resettlement site for Liberated Africans. However, the Liberated African village was laid out on the Kent to Waterloo pathway near the original Sherbro town. Because of the confusion related to two different villages of the same name, government officials took to calling the Liberated African site, "New Tumbo," and that of the Sherbro, "Lower Tumbo" (Townsend, 1844; Wilson, 1844; Fyfe, 1962:209). Besides marking the formal beginning of colonial administration, the establishment of the New Tumbo also institutionalized the presence of Christianity. According to Rev. William Quaker, an African pastor with the Church Missionary Society: "This village before the year 1845 had never had any resident missionary agent although it enjoyed their occasional services. But before this date, it had a school which was under a government schoolmaster. [Now] the village contains about 400 inhabitants, and has no less than three distinct places of worship." (1854). These competing religious forces included the African Methodist, the Huntingdonians, and the Church Missionary Society, the former two churches founded by Nova Scotians in Freetown (Fyfe, 1962:201).

By the mid-19th century the fishing industry in the Peninsula was a key area of employment and production, with an estimated 120 boats and canoes employing crews of about 850 men. Fishermen could be found fishing the open sea, as well as the coastal and estuarial waters around the Colony. Given the high demand for fish during this period, one

source estimated that a boatowner was capable of making a monthly profit of between ten and fifteen pounds sterling on the sale of fishery products (Peterson, 1969:273). The most prominent means of production continued to be the use of vessels with cast nets, the employment of beach seines, and deep sea-lining. In addition, sails were now in widespread use, thus greatly expanding the range of maritime exploitation. The largest market was Freetown, and it attracted the majority of the total fish production in the Peninsula environs. Elizabeth Melville noted that the Fish Market in Freetown was always "well supplied with fish," naming mackerel, mullet, sole, snapper, and barracuda as being most accessible to consumers (1849:112).

The leading fishing production sites during this period were the villages of Aberdeen and Murraytown on the northern end of the Peninsula, and York and Kent to the south. Together, these villages are said to have supplied most of the dried fish for the Freetown market (Melville, 1849:112). However, York and Kent fishermen were not the only fishermen to be attracted by the market demand for fishery products. We know that Yawri Bay fishermen from Kent, Tombo, and the Banana Islands annually migrated to the Isles de Los from about mid-December to May or June, where they fished for snapper using longlines, as well as barracuda, carrying their catch either weekly or semi-monthly to Freetown for sale depending on the size of their catch (Bultmann, 1851; Davies, 1860).

An important socioeconomic feature of these migrations is that Yawri Bay fishermen were entirely responsible for the processing of

their catch, usually grilling or salting, as well as the marketing, labor that would later become the primary functions of women. This fact is demonstrated in the description given to James Hornell, a British colonial fisheries officer, in the 1920's. According to Hornell, Yawri Bay fishermen carried on deep-sea fishing in boats manned by five men, each with two longlines. The men carried enough food and water to last three or four days and firewood for cooking and for drying some of the fish on grids placed over a wood fire in a sand box. Each man also brought along a bag of salt for curing fish that they were unable to grill. The catch of each fisherman was kept separate and marked by cutting off the fins or some other distinguishing manner, and consisted primarily of large snappers, a fish highly prized in Freetown, together with barracuda, tarpon, and other large fish (Hornell, 1928a:50-51; Sibthorpe, 1970:192-93).

Tombo's geographical position made it an ideal port on the north Yawri Bay coast for sea traffic from the south at Shenge and the Plantain Islands, as well as by watercraft from the north. This factor together with its food economy, led to a dramatic increase in the village population by 1891. The first extensive colonial census for th Peninsula in that year reported a Tombo population of 438 inhabitants and 103 houses in a settlement by then divided into three sections -- Sherbro Town, Kassie, and Krio Town. This made Tombo the second larges village in what was then known as the Western or Sea District of the Colony.

In the first two decades of the 20th century major changes began to impact upon village socioeconomic relations in profound ways. The first concerns the enactment of the 1900 "house-tax" by colonial authorities, which was designed to integrate Colony and Protectorate inhabitants into the capitalist economy, while providing revenues for the administration of the colonial apparatus. Consequently, wives of Tombo fishermen would travel to Waterloo, Freetown, or Kent to trade processed fish for cash to pay the tax. This practice led to more formal arrangements between Tombo women, who acted as wholesalers, and Waterloo women, in particular, who assumed the role of fish retailers (Oral Interviews, 1982:Pa Johnson).

The historical importance of this trading practice is that it reinforced the gender-based aspects of the division of labor within the Tombo community. The production of fresh fish became a more strictly defined male activity, while the primary functions of women became solely one of completing the process by "cooking" and marketing the fish. Consequently, women were asked to assume a far greater economic responsibility within the total production system (Hendrix, 1983:83-84).

A second important change began to occur in Tombo following World War I. The prolific fishing grounds, good beach, and an increased standard of living on the Peninsula led to an in-migration of several ethnic groups from the Protectorate. The most important of these was that of the Temne during the 1920's. Temne fisherfolk initially arrived in small familial groups, and gradually increased during the interwar period. According to local traditions, the first Temne reached Tombo

from the shores of Yawri Bay by canoe via the Ribi River. The Temne had a profound impact on the language and culture of the village, as Temne came to replace Sherbro as the lingua franca, and Islam gave institutionalized credibility to the re-establishment of polygamous households (Oral Interviews, 1982:Pa Adikali Kamara).

A third important change in the Tombo fishery that was apparent during this period occurred in the area of the production system. Tombo fishermen had made a decision to specialize in the bonga (Ethmalosa fimbriata). James Hornell tells us the reason:

> The bonga is essentially the food of the poor and of the inland (Protectorate) natives, people of low purchasing power. Very little fish goes inland in Sierra Leone except bonga. (Hornell, 1929:4)

Peninsula fishermen used gill nets, draw nets, staked weirs (especially during the rainy season), and beach seines were also employed to harves bonga (Hornell, 1929:4). The traditional set nets could be employed as gill nets, and anchored or buoyed in off-shore fishing grounds overnigh in order to catch bonga. Drift nets may also have been utilized at times in bonga fishing (Brainerd, 1984).

The processing of bonga for market by Tombo women was primarily accomplished using two methods, by smoking or grilling over a wood fire of frying in palm oil. Each of these methods was observed as early as the 1790's by Winterbottom (1803:64n) being practiced. Hornell informs us that the early 20th century version of the smoking oven or banda consisted of

> a framework made of two parallel poles about 6 feet distant from one another, supported at about 20 to 24 inches from the ground upon short stout posts having a crutch or fork at their upper end. (Hornell, 1928:17)

The frame was then covered with wooden sticks placed perpendicular across the width. By 1928, the wooden sticks were replaced by wire mesh or iron grids in some parts of the Colony, a factor that probably increased the amount of fish that could be processed. Nonetheless, while the demand for fish in the Colony and Protectorate remained high, this post-harvest technology was inefficient. Processing consumed enormous amounts of a woman's time, requiring about three days to complete the smoking/grilling, and the quality of the product varied greatly (Hornell, 1928:17-19).

Besides the problems related to the utilization of a simple processing technology, Tombo fisherfolk had to overcome the obstacles of poor marketing infrastructure, particularly the lack of roads. The sale or exchange of fishery products was the primary means by which they could acquire goods and services beyond subsistence, including modern gear and equipment. Thus, another significant contribution to economic change in Tombo was the construction and completion of the Peninsula Road during WWI, and the Kent to Waterloo road shortly thereafter in 1920. Together these arteries greatly facilitated the movement of processed bonga from Tombo into Waterloo and Freetown. With cash, Tombo fisherfolk could more readily purchase canvas sail, fishing line, fish hooks, and wire mesh for the fishery, as well as processed goods for household consumption.

From about 1930 to 1950, the Tombo fishery was in a state of socio-economic equilibrium, as fisherfolk continued to meet their subsistence needs, pay taxes, and purchase some of the necessary tools to maintain

production levels in the fishery. Consequently, there was no appreciable change in the production technology nor, perhaps, the capital accumulation which would have enabled them to develop new means of production to expand the fishery. Moreover, there was a lack of commitment by colonial authorities to improve the conditions of Peninsula fisherfolk. Hornell's recommendation set forth in the 1928 report on the state of Sierra Leone fisheries were never acted upon, and were reiterated in 1945 by G. A. Steven, another colonial fisheries officer. Steven's report is interesting from the standpoint of describing European activity in commercial fisheries using modern trawling methods, but this sector required intensive capitalization in which Western District fishermen were at a disadvantage (Steven, 1947; Hornell, 1928a).

The most important modern socioeconomic development of the Tombo fishery was the arrival of the Fante fishermen from Ghana in the 1950's. They are credited with introducing almost all of the significant innovations that promoted the fishery into a viable commercial industry. The Fante introduced the modern ring net, or Ali net, primarily designed for the harvesting of herring, a fish that Yawri Bay fishermen had previously used only as bait; larger dug-out canoes, and new ideas about crew size, division of labor, and canoe construction. They introduced an entirely new boat design requiring even larger crews, and outfitted with the larger Ali net. This was the 10- to 14-man plank canoe with motorized power, measuring about 35 to 40 feet in length with a depth of over four feet and a beam of about six feet. These boats had an almost immediate social and economic impact. First, they made it increasingly impossible to maintain a crew solely of patrikin or matrikin relations.

Further, the increased boat and net sizes increased the initial capital outlay, costs of operations, and maintenance (cf. Christensen, 1977).

In the processing sector, the Fante were responsible for the introduction of the present banda design of mud bricks, topped with a wire-mesh grill, and framed and supported by wood or, ideally, iron poles. This new grill was larger, ranging in lengths upwards to about twenty-five feet with widths from three to eight feet, and permitted a hotter fire and more rapid smoking. While the capacity of the new ovens (400 - 1200 dozen bonga) greatly expanded production, they also increased the risk, since much more heat was required, as well as the expense since they also increased the consumption of firewood. Thus, the fire had to be keenly watched for the first three or four hours of smoking in order to avoid substantial losses (Oral Interviews, 1982).

As a result of Fante competition and technology, the Tombo fisherfolk were forced to reorganize their socioeconomic relationships in revolutionary ways. But, by the 1960's, Tombo fishermen had acquired the necessary skills and adopted the new technology. However, because of the high initial capital outlay demanded, non-fishing boatowners became more prevalent. Women, for example, began to use their economic position in the market to finance boats, some of whom migrated to Tombo from up-country (Oral Interviews, 1982). Merchants and traders, like the Fulas and Krios, also began to participate in the industry directly as boat-owners or in partnership with master fishermen.

The larger crews required a master fisherman as captain, who might also be a boatowner; a "net-boss" responsible for the net; and regular crew members to help carry out the fishing operations. The crew was drawn from a labor force of drifting men, organized in the village under the traditional system of patron-client relations, as well as from kin groups. Client fishermen received a share of the crew's share and could choose to sell it for cash to fisherwomen or, if married, give it to their wives. Commonly, wives of client fishermen function as cooks in the community, selling "chop" (meals) to fishing households. Kin fishermen generally received no wages, but lived in the boatowner's or master fisherman's household, often receiving major compensation later in the form of bridewealth. Some boatowners could permit the crew to fish one day a week for themselves (Oral Interviews, 1982; Kotnik, 1981).

With the introduction of the new production technology, the catch during the peak season (November-May) was often greater than Tombo women could process even with the larger bandas. This led not only to the construction of multiple ovens by single households, but encouraged fish sellers from Waterloo and Freetown to buy directly from Tombo fishermen and process the fish themselves. These relationships were formalized arrangements and reinforced with presentations, such as food, cigarettes, tobacco, and liquor. The economic relations adduced by such gifts can be seen as part of a scheme of social relationships permitting the expression of traditional values of reciprocity and redistribution within a new socioeconomic and technological system (Hendrix, 1983a: 93-94).

The increased production also had a profound impact on the family. Because the division of labor is largely gender-based, monogamous families appear to have been unable to meet the labor demands placed upon females in the processing and marketing sectors. Consequently, over a period of about twenty-five years, Tombo began to move from a predominantly Christianized community with monogamous family units to a predominantly Islamicized community (95 percent), where polygamy (79 percent) today is the most prevalent familial system (Kotnik, 1981).

In short, the period from about 1955 to 1965 can be characterized as a period of radical social and economic development in the Tombo fishery in which the village and the fishery underwent significant change. During these years, the increased production led to the creation of new long distance markets at Makeni, Sefadu, Kenema, and Koindu, in which Tombo women directly participated. Also, lorries packed with fishmongers began to appear from Freetown and elsewhere to purchase the surplus production, reaching even more provincial outlets. Not surprisingly, this increasing activity led to new ethnic migrations, the most important of which was that of the Fulas from Guinea. The major contribution of this group has been their ability to organize the woodcutting activities and firewood supply, which together with their small shops, created a new occupational subgroup in the Tombo economy (Kotnik, 1981; Hendrix, 1983a:95).

By 1967, Tombo Village had grown to a population of about 2500 inhabitants at peak fishing season. While the Fante fishermen were forced by the Sierra Leone government to repatriate from Sierra Leone by

the government in the 1960's, they nevertheless left behind them an active and viable production system. Besides woodcutting, new service sector employment was created for local inhabitants as well as new immigrants. In 1980, about thirty percent of the population (male) were involved in fish production; 33 percent (women and small children) were in processing and marketing; and another approximately 33 percent were engaged as boatbuilders and carpenters, mechanics, woodcutters, cookers, and oil and petrol suppliers. The rest of the population provided retail and community services, and included petty traders, farmers, tailers, government employees, teachers, and palm-wine producers (Kotnik, 1981). This diversity in employment was created by the adoption of new technology which demanded formation of new socioeconomic relationships, while availability of capital attracted new labor resources and new community services. Together, these factors helped to make Tombo one of the three major industrial centers for the production and marketing of fishery products in Sierra Leone today.

SUMMARY

This paper attempts to explore the dynamics of technological development within the context of maritime fishing practices on the Sierra Leone Peninsula from about 1600 - 1980. It posits that technological development in Africa derives from a number of complex but interrelated factors. Among these are an existing techniculture, appropriate natural resources, and a concept of development intellection. The paper argues that the physical equipment of a maritime techniculture existed within the environs of the Sierra Leone Peninsula among several

ethnic groupings prior to the advent of Europeans, as well as the knowledge of how to use it for economic purposes. From about 1600 - 1800 this technicultural base and its applications were characterized and documented. The colonial experience which follows this period had no appreciable effect upon the technology of Peninsula fisherfolk outside of the Liberated African communities.

As an example of this process, the fishing village of Tombo, founded about 1800, is utilized as a case study. This examination reveals a fishing community that had an essential capacity to change its social relations as it simultaneously adopted new technologies and fishing methods for economic betterment. It not only accepted such changes, but also provided economic opportunities to new immigrants, and, in turn, benefitted from their inclusion. Until quite recently, Tombo's economic development was only partly restricted by its technoculture. Two other factors were also important -- the general underdevelopment within the Colony and Protectorate, particularly poor roads and poor consumer purchasing power, problems which still continue to plague the fishery.

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Table 1: LOCAL NAMES FOR SIERRA LEONE FISH SPECIES

English	Mende[1]	Temne[2]	Bullom[3]	Krio[4]
fish (n.)	nye	ka-lop	yu, yenchek (pl.)	fish
catfish	gbele	ka-ten	gbokbo	sea cats
	gbokobo	ka-ton		
	hala	a-lolbuko		
	kata	a-kat		
	kpelo	a-tamaru		
	makonde			
	ndegbe			
snapper (dried)				kaugar[6]
grouper	kole-nye			grooper
barracuda			?bekune[5]	couta, kenny (juv.)
sea crab	ngaku	k'arankes		crab
crocodile	ndamba	a-kwi, a-futo	kew	crocodile
bonefish				tenny
hippopotamus		u-ka		
torpedo (electric fish)	dani	ra-niñk		skeete
eel	cupu	ka-'bal		
	tupunye			
	kotonye			
	hema			
electric eel	kpikpi			
garfish	bobo, njengbe			adarei
croaker				gwangwa
skate		a-fak		skeete
herring	poli			lati
jumping fish	kondo	ka-bup		
manatee	gbuani	a-peram		
crawfish	gbende, folema	ka-samp, k'ampti		
crocus				krokos
mullet	tombo	a-sek	sek	mollid
oyster	nwoni	ka-bola	evai	
shrimp	pepe			
lobster	kpaa			
shark	tumu	a-tumu	ubullo	shark
shell, mussel	noto	ka-bola		
tilapia	ngoka			mangopage
tortoise	haku	akunsese	kong, tékun,	
		a-sabani	gburrukump	
cutlass fish	ndanye			
sawfish		a-kañk		

Table 1, continued

English	Mende[1]	Temne[2]	Bullom[3]	Krio[4]
other fish species (unidentified):	mbola	a-bilan	chok	
	ligboligbo	a-benkabenk	kuamus	
	vulu	a-belan	piath	
	gbou	a-beti	tol	
	ndigbi	a-benten	gbampo	
	baateema	e-boyo	velsok	
	yokende	a-bama		
		a-banba		
	kaama nye	ka-baren̄		
		a-bampo		
		ra-bos		
		a-kem		
		a-fere		
		a-keria		
		a-kut		
		a-kwoti		
		ka-wil		
		kukun		
		a-yoso		
		a-rokrok		
		a-sapso		
		i-pit		
		ka-fore		
		tokti		
swordfish	mbowa nye			
shad				bonga awefu (juv.), kawaifu

[1] Migeod, 1939; Schön, 1884; Innes, 1969.
[2] Thomas, 1916; Schlenker, 1861, 1880.
[3] Sumner, 1921; Nyländer, 1814.
[4] Kamara, 1973; Kup, 1962.
[5] Barbot, 1746.
[6] Sibthorpe, 1970.

Table 2: MARITIME TECHNOLOGY AND CULTURE

English	Mende[1]	Temne[2]	Bullom[3]
fish (v.)	nye gbe ndoli wili	kor koras (fish for) lam (ith net) loma , vith hook and line)	hoth
fish hook	noli, fugba	a-namp	molen
fishing rod, pole	vugba	ka-tróktia k'antr ka-lomana	tai
angle		trókti	
float (for hook)	kpengbe	fói	pung
fisherman	nye gbema	u-loma, u-lam	
canoe	bomu lende menge ndende	a-bil	wom yongru
broken canoe		a-bento	
boat		a-yal	
mast		ka-túli	
harpoon	kpaa	a-bala	
oar	lala, laa	a-lalá, nas	lala
canoe seat		a-tal	
rudder	gbi	a-kora	gbeak
anchor	gbi hou	a-fatr (iron)	tù
sail	fefe kule	a-bella	bella
steer		kor	
helmsman		o-kor	
crew		a-yama	
caulk		suntr, kok	
landing place, port		ka-báke	bondo
bough			ula
smoke (fish)		kul	thé
capsize (a canoe)		loná	
beach	kaku	a-bonolo	
sea coast	njagbenga	lánè	
sea	kpoye	ka-bañ	hélé
row		nása	yátta
rowers		a-nás	
water, tide		m'antr	'men
salt water, sea water	kpolo-ya	ma-pak	'men nhel n'fulung
brackish water		pampa m'antr ma-pak	
high water (tide)	hele, hee	ma-las	
ebb tide		ma-boi	
neap tide	gbili, gbii	a-kap	
deep water		a-yol	
fathom		tunt	
race (in canoes)		sorane	

Table 2, continued

English	Mende[1]	Temne[2]	Bullom[3]
gills	nye baa bu	a-kaiikaii, kakai	
fish fin	kpakpa, ndi hu gaja	a-nasane	
fish bladder		a-foia, o-foya	
fish scales	nye ga	a-kampita	
bait	tomo	a-wont	bet
fishing nets	nye gbe bora	ka-pel	pel
casting net	kamande, kamanti		
drag net	kende	ka-pel ka-lin	
seine net	sae		pel
set net	saga		pel banka
			pel baha
			pel bobo
woman's net	mbembe	ka-bembe (timo)	pel tumo
drift net			pel kuku
draw net			pel bono
fish baskets	piya	ralama	
	ka-buloko		
fish traps	mbumbu(i) kpava	ka-tunk	
	vaimai kulu	ka-yon	
	ndosi vanyama		
	vaa		
to hoist (as a sail)		yisa	
narrow sea		ka-ban ka-sénka	
fish fence, pen	nye kata	a-bañk	biñg
fishing line, twine	kale	ra-pol	bank
roll (waves)		kumle[4]	
fish poisons	tawi[4]	katol[4]	

*For references, see Table 1.