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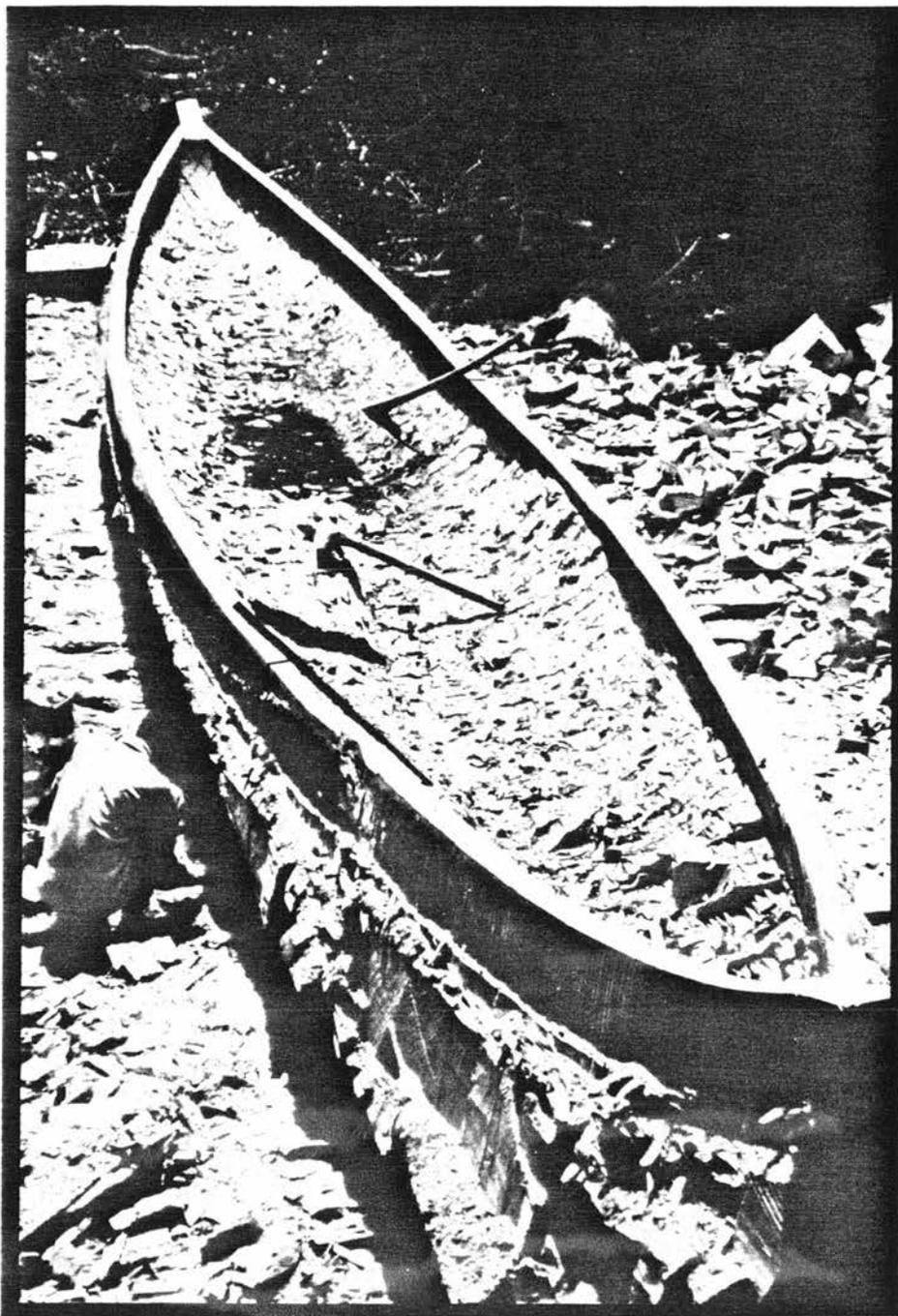


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THE COASTAL FISHING CANOES OF GHANA



NICOLA O'NEILL

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MASTERS THESIS



SCOTTISH INSTITUTE OF MARITIME STUDIES, ST. ANDREWS UNIVERSITY

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ABSTRACT

The coast of West Africa is home to what are possibly the world's largest dugout canoes, which are still being constructed and used as successful coastal fishing vessels.

Ghana is the country which produces the majority of West Africa's large dugout canoes and in terms of conservation there are only a limited number of trees remaining in Ghana's forests with which to make them. In January 1990 I went to Ghana to record the various stages of canoe construction. It is impossible to ignore the importance of the 8,000 strong canoe fleet, which account for some 70% of the marine fish landed on Ghana's shore, therefore I took the opportunity to record the fish processing and marketing. The canoe is not simply a boat but a concept which permeates many facets of the fishing community's life, including economic, social and cultural aspects.

There is much uncertainty about the future of what today is a thriving canoe fishing industry but, if the present rate of construction were to continue, the dugout, as a method used for the construction of artisanal fishing vessels over 15 metres in length, will be extinct within thirty years. This study serves as documentation of the canoe construction methods of Ghana's past.

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ABBREVIATIONS

ADB	Agricultural Development Bank
EEC	European Economic Community
FAO	Food and Agriculture Organisation of the United Nations
GNCFC	Ghana National Canoe Fishermen Council
IDAF	Integrated Development of Artisanal Fisheries in West Africa
ODA	Overseas Development Administration of the UK Government
UNDP	United Nations Development Program
UNICEF	United Nations International Children's Emergency Fund.
UST	University of Science and Technology

CURRENCY EQUIVALENTS

Currency unit in Ghana : Cedis (c)

Exchange Office rate at time of quoted prices : \$ = 350
f = 550

fig. 1

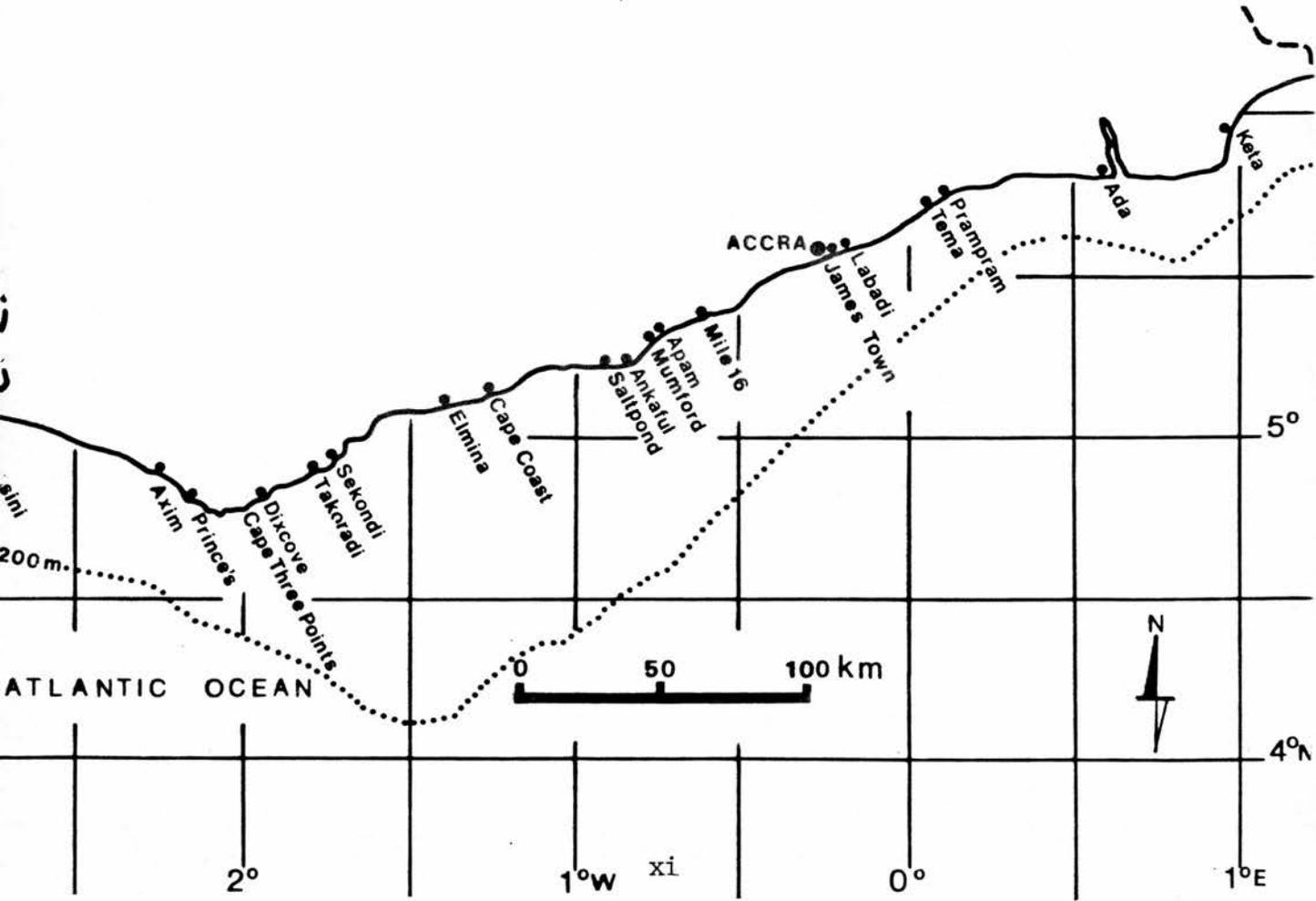
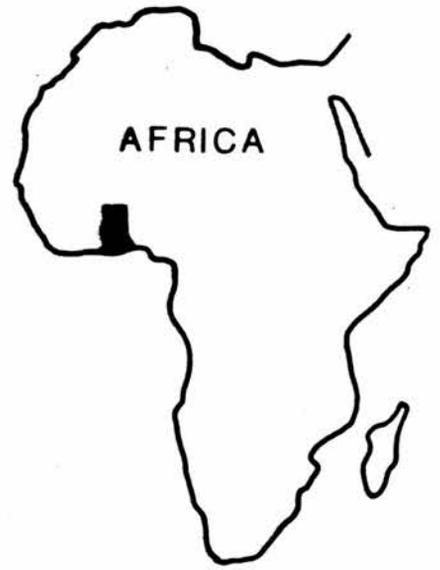
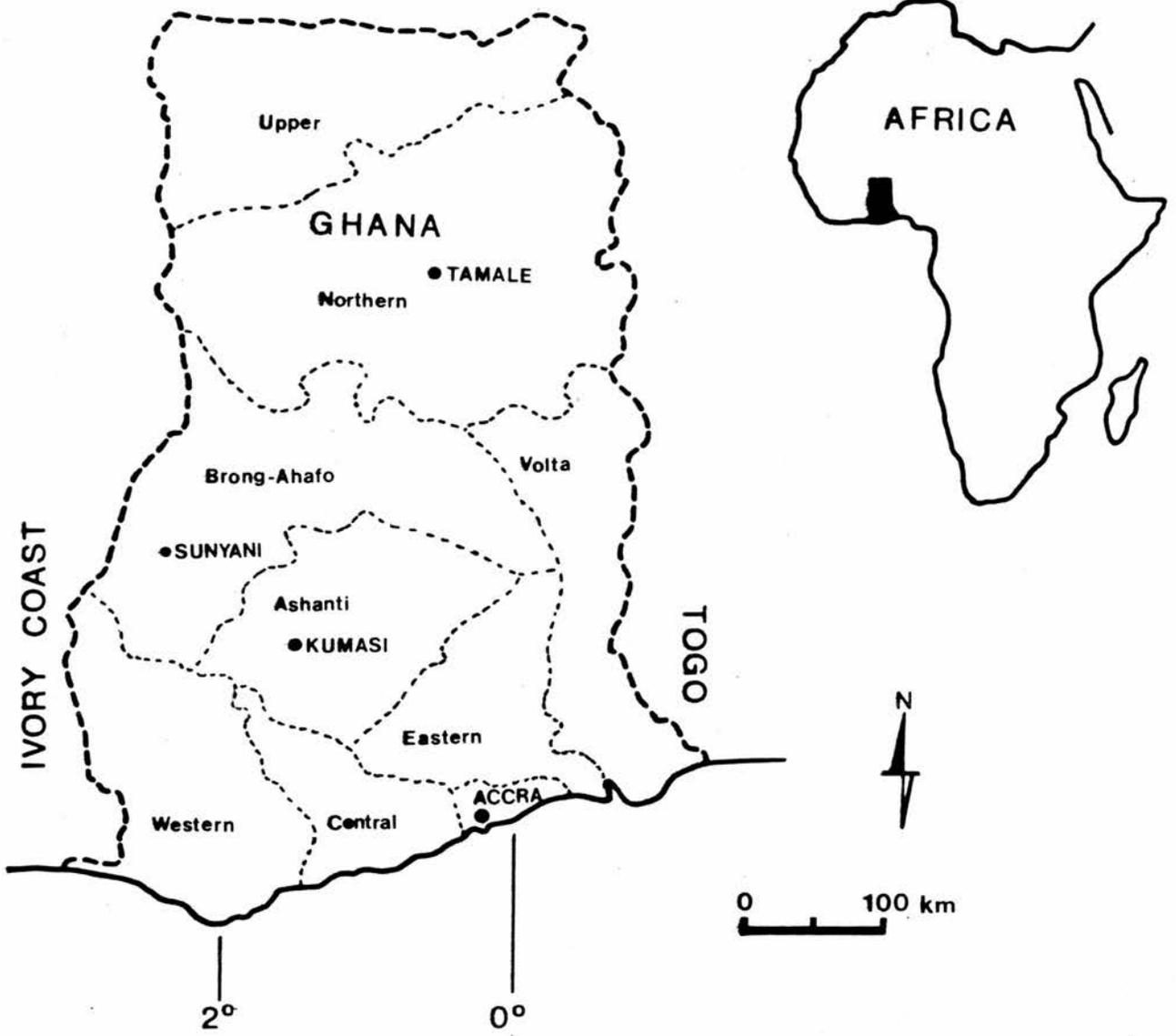


fig. 2



INTRODUCTION

Whilst working as a Development Officer in Ghana during 1986 I was struck by the size, number and diversity of the canoes beached along the entire coast. During my stay I gradually learnt more about the canoes and their significant role in the coastal economy. It also became apparent that the existing canoe fleet was under severe threat due to the diminishing number of trees left in the forests of Ghana which were suitable for the construction of ocean-going canoes. Thus there are a finite number of years remaining in which the dugout method of construction can be used for sea-going vessels over 15m in length.

The dugout has fulfilled a major role in the development of boat building and it evolved at an extremely early period of Man's history; a dugout of similar size, the Hasholme boat, has been carefully looked at in an archaeological context.¹ The dugout technique is still in use in Asia, South America and Africa,² and, by observing living people still using hand tools, we can relate this information to probable construction methods used on ancient logboats, thereby "studying the present to understand the past".³ Ghana has a warm climate and until recently, a plentiful supply of trees from which to build canoes. These factors have meant that the development from logboats to plankbuilt boats has not yet occurred and the country is a rich area for an ethnological study of this kind. Given that the large dugout canoe industry is doomed, it is vital to record the process of canoe construction in Ghana while the tradition is extant.

Fishing along the coast of Ghana is the most important occupation; at present the artisanal fisheries has a fleet of over 8,000 canoes, responsible for some 70% of

all marine fish landed on Ghanaian shores. There are also a number of secondary groups linked to the artisanal fisheries such as the carvers employed in providing the vessels to meet the needs and budgets of the fishermen. They in turn provide employment for the women who process and market the catch throughout Ghana. It remains to be seen if the volume of catch can be maintained when the larger canoes are replaced with modern-style fishing boats and it is clear that there will be much structural change within the industry in the near future. Planning for that change will be aided by an understanding of the current elements which make up the dugout canoe sector.

Upon my return to Britain I continued my interest in Ghanaian dugout canoes. However, information from secondary sources proved to be inadequate due to the scantiness of original research and observation on West African canoes in general, and Ghanaian vernacular craft in particular. Specifically, there is a lack of technical description on West African canoes compared to work published on dugouts in other parts of the World.⁴ This paucity of secondary sources further prompted me to act on my feeling that recording of current dugout canoes was imperative.

Given all these stimuli I decided that some intensive fieldwork was required to adequately record what could soon be an extinct tradition. I therefore returned to Ghana in January of 1990 to spend six weeks in the field recording the various stages of canoe construction. At each stage of the process I was able to question the people who carry out the carving of the canoes. Throughout the phases of construction I detailed progress by means of measured drawing and photography. I also took lines measurements from two large canoes and measured the length, width and depth of approximately 20 canoes, both extant and derelict. Aspects of the carved

decoration on the canoes and their local meanings, along with customs and rituals surrounding the construction and use of a new canoe, were also recorded.

The initial week was spent gathering information on how an order for a new canoe is placed and where the canoe carvers were operating in the forest reserves. In the second week I joined a team of canoe carvers in the forest and noted the initial stages of the construction of two large canoes. I then followed the story to the second team of carvers who completed the canoe by planking up and fitting out, ready for the carved decoration to be added by another craftsman. The final part of my study centred on an investigation of the maintenance and repair work to the canoes along the coast, the use of the canoes as fishing vessels and the related artisanal fishing industry. During this period in Ghana I was able to meet with Governmental Fisheries and Forestry Departments, various Fisheries Officers, Chief Fishermen and Development Agency Fisheries Advisors, along with botanists and historians within Legon and Kumasi University departments.

Gathering information by oral testimony is fraught with dangers, not the least of which is gauging the accuracy of statements given by witnesses. Fortunately, I was able to cross check my material with members of Fisheries Research Agencies. Indeed I may have had an advantage over them in that the nature of my research was informal and so I was able to build up a productive rapport with the canoe carvers and fishermen, who were less intimidated by my presence than they might be by representatives of official organisations. There was in fact little reason for dishonest material to be given to me. Due to the limited secondary sources I arrived with an unprejudiced outlook on the subject of canoe carving and was therefore less likely to ask biased questions.

The team of carvers I accompanied in the forest to record the felling and roughing out phase were not strictly typical of all canoe carving companies working in the reserves of Ghana. This team were fortunate to be operating within a reserve which still had a plentiful supply of mature trees; other canoe carving companies are now experiencing difficulties in locating suitable trees from which to carve the large canoes. Another fairly unique feature of this company was their ownership of a chainsaw with an operator, who originally came from the north of the country and had worked for timber merchants for many years before joining the team and learning their skills. The majority of carving companies either hire a chainsaw with or without an operator from the timber merchants, or a member of the team learns to use a chainsaw once he is familiar with canoe construction. This chainsaw operator was well educated and spoke good English, allowing me to gain a greater understanding of the constructional processes than if I had gathered my material through a translator.

The order for the canoe is placed by fishermen who travel to the forest reserves over 200 km from the coast to lay down their specifications. My research is simply a record of the relationship between these fishermen and two unrelated sets of carvers who contribute to the construction of a finished canoe, neither set of whom actually use the canoes they construct. The process is a complex series of specialised interactions between three separate groups of people. In order to set this relationship in context, it is necessary to investigate the geographical and historical background to the coastal canoes together with the social and economic factors bearing upon the canoe builders.

PART I

CHAPTER 1

1:1 The Geography of Ghana

In 1957 Ghana was the first equatorial black African country to gain independence from British colonial rule. English remains the lingua franca, but there are also seven dominant local languages. The country has endured much political and social upheaval and is presently under military government.

Ghana is situated on the southern coast of the bulge of West Africa. It extends 850km North from 4° 45' North of the Equator to latitude 11° 11', and stretches between longitudes 3° 07' West and 1° 14' East. The Greenwich Meridian passes 27 km East of the capital, Accra. Ghana is ringed by the three republics of Upper Volta to the North, Togo to the East and Ivory Coast to the West. In the South it borders the Atlantic Coast for 536km. The country has a surface area of 238,537km², divisible into five geographically distinct regions comprising plateaux of varying elevations, namely:²

- i) The coastal plains, 100km in depth, which are low lying, generally flat and covered in shrub and grass.
- ii) The forest dissected plateau, lies north and west of the coastal plain, with an elevation of between 250m and 300m.
- iii) The Volta basin, which covers 118,000km² with elevations of between 50m and 150m, and was

formed by the Volta river system.

- iv) The Savannah High Plains are north and west of the Volta basin, and have elevations between 150m and 300m.
- v) The escarpments and ridges bordering the Volta basin; average height 450m rising to 900m near the Togo border.

Ghana is well drained by rivers, all of which flow into the Atlantic Ocean. The rivers in the North are subject to highly seasonal rainfall, making their flow intermittent with periods of total dryness to floods. They are not navigable for long stretches due to rapids. Rivers flowing through the forest region have adequate rains and are permanent.

3

The coastline itself is relative unbroken, with very few islands offshore and no natural harbours. The shoreline is subject to varying degrees of erosion; some beaches have now eroded back to bedrock. Lagoons have developed at most of the river mouths along the coast, due partly to the absence of powerful tides which would have prevented an accumulation of sand. The tidal range is less than 1.5m along the coast. Two artificially constructed harbours exist at Takoradi and Tema and were completed in 1928 and 1951 respectively. Elmina in the Central Region provides the only sheltered anchorage along the coast for inshore fishing fleets. The coastline can be broken down into the

following four maritime regions:

	<u>Coastal Length in km</u>
Western	193
Central	148
Greater Accra	120
Volta	75

From West of Cape Three Points the coast consists of flat, wide beach backed by coastal lagoon; the average wave amplitude here is low. Between Cape Three Points and Tema there is a coastline of rocky headlands and sand bars enclosing coastal lagoons. Here there is a South Westerly prevailing wind which causes oblique wave approach to the shoreline and the surf zone is of medium to high energy, with wave heights frequently exceeding 1m. East of Tema to the border of Togo the shoreline is sandy and characterised by the eroding delta of the river Volta. Wave height again often exceeds 1m. ⁴

1:2 Historical sources relating to Ghanaian Dugout Canoes

The warm, wet climate of Ghana is naturally determined by its geographical location, however this humid atmosphere is not conducive to the long term survival of wooden artefacts; even those as large as dugout canoes. The life of the individual canoe is short, on average six years. It is unlikely that material remains will be found to substantiate a date for early use of sea going canoes and their associated equipment and it is unlikely that ethnographers will be able to link archaeological finds to the canoe building techniques in use today. ⁵ It is fairly certain that from at least the 15th century to the present day the dugout

canoe has played an important role in the history of Ghana. The canoe has been in use extensively throughout the inland waterways, probably a lot longer than the sea going canoes operating off the coast. We must, however, rely on written sources for insight into the historical past of coastal canoes. Early travellers to the West African coast, chiefly the Gold Coast (Modern Ghana), were discerning observers of maritime activities, and their writings appear to be careful and detailed, although much of the subject remains obscure. For Ghana there is no authority earlier than the 17th century; ⁶ the natives of Ghana have no literature preceding this time. Augmenting written sources there is a small amount of iconographic material available in the form of etchings depicting the coastal trading forts. These often include representations of canoes which were drawn to set the scene rather than objects of the illustration and thus are subject to a little 'artistic licence'.

The first authenticated landing by Europeans upon Ghana's coast was in 1471 by the Portuguese in their caravels. The first known English voyage to Ghana was in 1553, the Dutch arrived by 1595, the Swedish about 1640, the Danish soon after and the Prussians in 1683. ⁷ All the nations subsequently traded with Ghana and built their strongholds along the coast. As new ideas and materials became available these foreigners could have influenced the development of the Ghanaian canoe in terms of methods of propulsion and fishing techniques.

There are numerous references made by early writers to the types and sizes of canoes that were in use at the time of their travels to Ghana. Barbot, an early traveller who made several voyages before

fig. 3

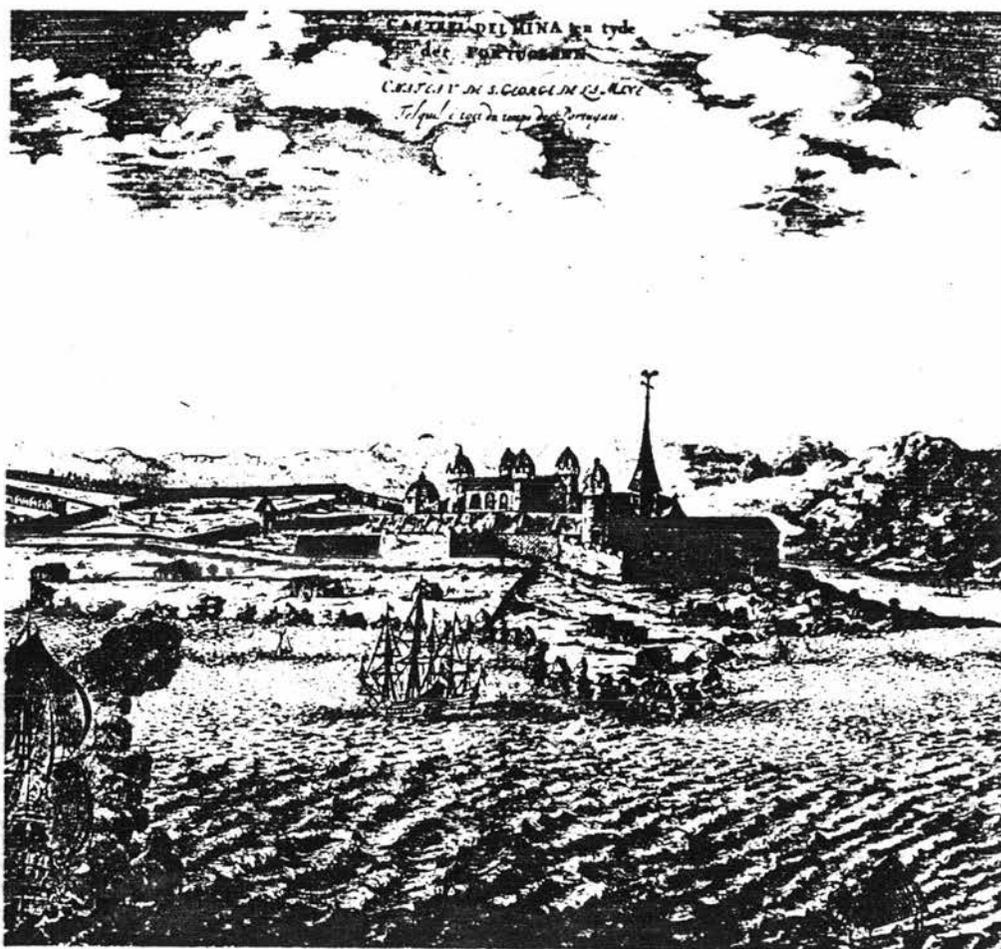
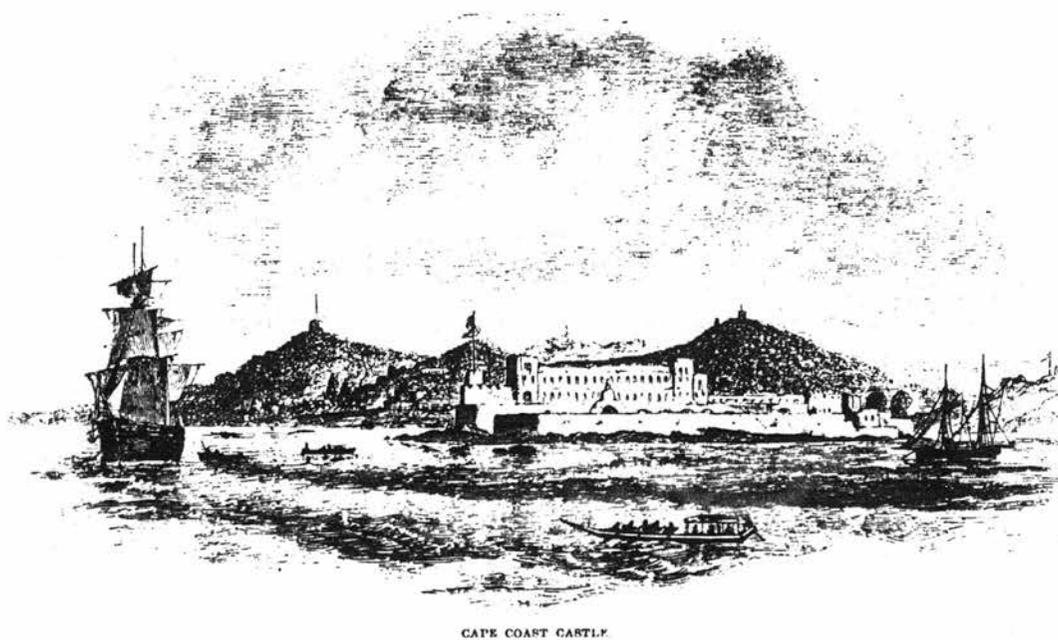


fig. 4



1682, noted that the inhabitants of the Gold Coast seemed most at home on the sea, passing over the bars, and carrying goods along the coast. The 'Mina' were the fittest and most experienced men to manage and paddle canoes, while the sailors of Axim and Winneba navigated their craft 'over the worst and dreadful beating seas'.⁸ This is one of the earliest references made to the use of sails along the coast of Ghana, these sails could have been made from cloth or rush mat as depicted by a Dutch artist in the 17th century. (fig 3) There has been some debate as to the origin of the sail on Ghanaian canoes. Dickson discusses the possibility that rush mat sails were the result of an attempt to copy the cloth sails on the Portuguese vessels. However, they may have been indigenous to the local people in the form of rush mat sails, which were then replaced by cloth as material became more widely available.⁹

It is not until 1701 that detailed accounts were made by William Bosman concerning the construction and use of fishing canoes (see 'A Description of the Gold Coast of Guinea' Let XVI and Let IX). The general commerce of the country was greatly obstructed by the lack of safe landing places for European trading vessels, thus they had to anchor offshore in the open sea whilst discharging and receiving cargoes. When they gained employment with the visiting Europeans, conveying merchandise through the surf in their paddled dugout canoes,¹⁰ the coastal people of Ghana were able to utilise and develop their existing maritime skills.

Early canoes were capable of travelling great distances on coastal journeys, both to trade and to fish. It is not known what distances were covered although Barbot made reference to Ghanaian canoes

A Description of the Gold Coast of Guinea.

LET. IX.

You must not take it ill that this Letter is filled up with a Medley of all sorts of Subjects; that, according to our Proverb, *I jump from the Ox to the Ass*; for I usually write what first occurs to my Memory. Having once mentioned their Navigation, which is not very considerable, I shall acquaint you they use a sort of Boats called *Canoas*; the largest of which are about thirty foot long and six broad: From this size they go down to the smallest sort, which are about thirteen or fourteen foot long and three or four broad. The biggest of these being capable of carrying a reasonable Merchant-Man's Boat lading; we generally use them in the transportation of our Goods from place to place: They are rowed in proportion to their size, by two, three, five, seven, nine, eleven or fifteen Rowers; which when they exceed two, must always be an odd number, because they are obliged to sit in couples, and an odd one is requisite to steer. Instead of Oars they use a sort of Paddles made like a Spade, having a Handle about the same length; with which paddling the Water with an under-hand stroke, they keep the *Canoa* in a very swift Course. With the least sort of *Canoas*, with two or three Men in each, they generally go a fishing; which leads me to their Fishing-tackling, consisting of great and small Hooks; also Harping-Irons, which they use when they have hooked a great Fish; They are besides furnished with casting as well as other large Nets; which last they plant in the Sea over Night, and draw them in the Morning; when they are frequently full of all sorts of Fish: But if a Sword-fish, or any other such rough Guest happens to get in the Net, 'tis sure to be torn in pieces with the Sword's Snout: But this Damage is easily prevented if the *Negroes* are timely informed of it; for they go two or three *Canoas* in Company well furnished with Harping-Irons; and considering they greedily eat this sort of Fish, if they can but take him, he makes amends for two or three broken Nets.

LET. XVI.

To return to my Subject, I averr that the whole Coast is filled with high and low Trees; and the charming shady Groves, serve to render the Malignity of this place more supportable; and so delight those who take their progress into the In-land Country, that they oblige them intirely to forget the intolerable badness of the Ways.

Here are some which naturally grow up in such a surprizing manner, as even Art it self must blushing own it could not have contrived any thing like it; others grow so thick and their shady Boughs are so wide extended that they form intire Alleys; which afford an amazing satisfaction to any who are enclined to take the Pleasure of walking.

I remember to have formerly read in *Olearius* and other Writers, of Trees large enough to shelter two thousand Men; and the Tree of which Father *Kirchen* (a Person, that, in my Opinion, should advance nothing but Truth) writes, that in its Fruit or Shell (I think it was a Chestnut) it could lodge a Shepherd and his whole Flock, must not be very small, but may very well pass for a wonder in Nature; but after all it is not in the least to be compared with the Trees of this Country. I have seen some here that twenty instead of two Thousand Men might stand under, supposing them close to one another: and if these Authors mean so, I don't scruple to believe them; nor I believe do you. But to pass over this; it is certain that here are extraordinary high and large Trees; which may be concluded from the great *Canoas*, of which I formerly wrote to you; and since these Boats must be made of a strait piece of Wood equally thick all over, and that very few Trees grow directly so, what I offer is not incredible, that the mentioned *Canoas* do not amount to above half the bulk of the Tree.

I have seen some of these Trees so high, that their tops and branches growing out of them were scarce to be reached by a common Musquet-shot. They are here called *Capot*-trees, because on them grows a certain sort of Cotton here called *Capot*; which is very proper for filling of Beds, especially in this country, where Feather-beds are much too hot.

The Wood of this Tree is light and porous, and scarce fit for any other use than making of *Canoas*.

travelling as far as Angola. Smith suggests that the canoe occupies a place of importance in the history of coastal, lagoon and riverside peoples in the West Africa equal to that of the horse in the history of Savannah states. ¹¹

Accounts of the coastal activities became more abundant in the 19th century. Notes were made of the numbers who paddled different sizes of canoes, ¹² of the helmsman who stood at the stern with a large oar to steer (fig 4) and of the smaller surf canoes with weather boards at the bow to fend off waves. ¹³ Hutton wrote in an account in 1821 of the trade the British made in the large canoes, which were procured in Ghana and supplied to the captains of Portuguese vessels, who made a point of calling for the canoes on their way to the Leeward Coast. They hired canoes and canoe-men to transport slaves from shore to ship. It was noted that the canoes were paid for with Portuguese tobacco and once the ships were loaded the canoes and their crew were set free to return by sea to their homeland. ¹⁴ This practice of transferring cargo from vessels waiting behind the surf zone, earned the Ghanaians a livelihood and continued until quite recent times, when they paddled European styled surf boats with their trident paddles in crews of eleven men, one man to operate the steering oar. These men were Fanti fishermen recruited from Cape Coast by the United Africa Company to carry all of Ghana's sea borne trade. ¹⁵ Once Takoradi and Tema harbours were open to trade and road and rail transport improved, the surf boats and their crew were no longer required and canoes returned to the sole function of fishing.

CHAPTER 2

FISHERIES

2:1 The Importance of Artisanal Fisheries

The majority of the 12.2 million population of Ghana live in rural communities and as many as 70% of these have been cited as being dependent on small scale and peasant agriculture for their subsistence. This figure includes those involved in artisanal fisheries.¹ The Continental shelf is wider along Ghana's coast compared to neighbouring countries (as much as 70 km wide) and the shallower waters provide greater scope for the canoe fishermen. Obviously large harbour based fishing boats are required for fishing offshore stocks, but there is little doubt of the importance of the artisanal fisheries within the fishing sector and to Ghana.

Table 1 shows the annual fish catches in '000 metric tons for each of the fishing sectors operating from Ghana.

Table 1	1983	1984	1985	1986	1987
Canoe fishery	137	171	150	190	262
Inshore fishery	20	15	18	22	15
Distant water fishery	17	16	22	22	20
Tuna fishery	31	29	34	35	33
Total catch	205	231	234	269	330

(figures reproduced from FAO Sector report 1989)

There has been a considerable tonnage catch increase since 1983, in stark contrast to that recorded by the other fishing sectors and canoe fishing accounts for about 70% of marine fish landed on Ghanaian shores. This increase in fish landed is due partly

to the greater productivity of labour, achieved by replacing the fleet of medium sized canoes with a growing fleet of larger canoes manned by a stable labour force. The introduction of outboard motors and multi purpose nets has also had favourable results on the catch from the canoe fleet since the 1950's ².

The industry creates more employment than any other fishing sector, and supports widespread settlement in coastal areas. The number of canoe fishermen alone was estimated in 1988 at about 105,000 men. The canoe fishing offers good local employment and a reasonable standard of living; the majority of the fishing communities do not belong to the really poor strand of the population of Ghana. In Ghana fish is by far the most substantial source of animal protein, as other sources are relatively scarce and comparatively more expensive. Fish consumption for Ghana is estimated at about 300,000 tonne per annum, although the government would like this figure to increase to 500,000 tonne for nutritional purposes. ³ Consumption is largely met from internal resources.

Ghana's coastline is populated by around 180 fishing communities, ⁴ and artisanal fisheries have been the traditional method of exploiting the marine environment. Fish are an important item of internal commerce and the small scale fisheries use less energy, require less foreign exchange and cause very little pollution. Their importance is reflected in the fact that Ghana has been one of the coastal African countries which has laid emphasis on the progressive development of its small scale fisheries. Such development has required the Ghanaian fishermen to develop the dugout over

decades and even centuries.

The canoe fleet is an important marine producer and unlike other types of fishing vessels the canoes cost little to service as they do not require harbours or jetties to unload their catch. The canoes can operate solely from beaches, where they can be manually hauled up for repair and maintenance. At present the canoe fishing industry is thriving and has not been affected by the recently developed capital intensive inshore fleet; rather the canoes co-exist with the modern craft.

5

2:2 Dugout Canoe Typology

The constant and successful evolution of the dugout canoe has kept it at the forefront of the artisanal fishing industry and today, artisanal fishing in Ghana is practised essentially with dugout canoes of varying sizes. They utilise various types of fishing gear that has been well adapted to this type of craft and local fishing conditions, meeting the specific economic demands within the canoe fleet. There are basically four types of canoe in use from the shores of Ghana. The size of the canoe is delineated by the maximum beam and overall length. Each type of canoe is used for a particular method of fishing and they are locally identified in the following categories: ⁶

- 1) Small one man canoe; the smallest of coastal canoes, 4 to 5m in length and 40 to 50cm wide. These canoes are symmetrically shaped, the stern being identical to the bow. This is a popular craft in the Western Region and is principally used to operate bottom set long lines and

handlines for fish such as snapper, grouper and other medium to large fish found over rocky seabed areas. These canoes are propelled by a single trident paddle.

- 2) Medium size line and net canoes; these are from 5 to 12m in length and 70 to 100cm wide. These canoes are used to operate bottom set and floating gillnets. The medium canoes are propelled by paddles, sail or 25 hp outboard motor. A 40 hp motor is carried on canoes when they stay at sea for three to four days, with a crew of up to twelve men to operate handlines. They maintain the quality of valuable fish, such as grouper, snapper, shark and others by keeping them on ice in an insulated ice box built into the mid section of the canoe. These canoes often carry sail as well as paddles on long fishing trips.
- 3) Large beach seine canoes; these are often old 'ali' canoes which have been converted for beaching seining operations (fig 5). Their size is approximately 12 to 15m long with raised bows to avoid taking on board water when crossing the surf. They use paddles or 25 hp outboard motors as method of propulsion. As these canoes work from firm, non-rocky beaches up and down the coast and have a range of 1.5km, they catch all fish from pelagic to demersal species including juvenile stocks.
- 4) Large ali poli canoes; these are the largest of all Ghanaian canoes and their length is between 15 and 18m and their width from 1.30 to 2m. The weight of these canoes has been estimated at 3

tonne. This size of canoe operate the 'ali' gillnet/driftnet as well as the 'poli' purse seine nets of different types. These canoes are propelled mainly by 40 hp outboard motors although paddles are used in the event of engine failure. The ali poli canoes carry a crew of between fifteen and twenty-five men, catching mostly small pelagic fish, sardine, herring and anchovy. Most of the fishing canoes with the exception of those handling stay out at sea from 3 to 12 hours. The ali poli canoe takes its name from the type of gear used.

2:3 Impact of Improved Fishing Technology on Canoe Design

When compared to other traditional branches of social production such as peasant farming, canoe fishing as a productive activity requires a substantial amount of capital and other resources in terms of craft, fishing gear and manpower. Equipment ranges from a canoe, paddle and handlines for the lone fisherman, to the substantial investment needed for the ali poli canoe and its gear, outboard motors, nets and larger crew. These modern, capital rich, Ghanaian canoes are the outcome of past improvements in fishing gear such as the introduction of the ali net just before the turn of the century. ⁷

At this time increasing population and subsequent urbanisation gave rise to bigger demand for cheap food, hence the need for larger catches. It is not clear from where the net originated or where it was first introduced. Historical sources suggest the net was brought by Europeans as it was similar to those in use as large drag nets around the British

coast at the turn of this century. The beach seine net came into use along the coast at the same time. These nets met with protest from some fishermen, but on the whole they were accepted and adopted. The ali net, for example, initially met with some resistance at the time of its adoption; it was notably larger than anything that had preceded it. Since then, its length and width have constantly expanded, forcing reciprocal increases in canoe size.⁸ During the 1930's the largest canoes had an overall length of 8m and a beam of 1.5m and these canoes had a raised box like structure at the bow to give the extra freeboard necessary when ploughing through the surf with heavy nets on board.⁹

Vercruijsse stated that the average size of canoe in 1948 was 7.5m in length, but by 1970 the average size had increased to 13m.¹⁰ This marked enlargement of canoe length reflects the introduction of nylon netting in the late 1950's and the outboard motor in the early 1960's. The alacrity with which Ghanaian fishermen adopted these modern inventions is reflected in the 1986 canoe census; 'Canoe Frame Survey' by W. Odoi-Akersie. This establishes the number and structure of the canoe fleet. In the following table the canoes are named after the type of gear they use.

Table 2

Type of Canoe	Total no. canoes	Motorised	Crew Size
Ring ali net	3,969	3,449	15
Beach seine	797	77	33
Set net	1,852	141	4
Line	1,004	401	6
Drift gill net	450	369	6
One man canoe	142	0	1

Of the total number of 8,214 canoes some 54% are motorised and 48% of the entire fleet comprises large and modern ring ali net canoes. ¹¹

2:4 The Mechanics of Modern Fishing in Ghana

As has been stated, the introduction of the ali net at the end of the 19th century had a radical effect on the development of the Ghanaian fishing canoes. This in turn had many ramifications on the human aspects of fishing such as ownership, employment and labour relations. Prior to the introduction of the larger nets at the turn of the century, canoe fishing had the characteristics of the 'petty commodity' mode of fish production ¹². The introduction of the ali nets had many implications; the cost of the canoes and gear was relatively expensive, thus preventing a lot of fishermen from owning canoes and gear as easily as they had previously. Consequently, many fishermen began to earn a livelihood by working as crew members for canoe or net owners, sharing the catch to help cover the costs of canoe and net. A division of labour came about with each fisherman contributing a share of his catch to the canoe owner.

A more hierarchical system has evolved in response to these changes and it is now the canoe owner's responsibility to organise the crew for his canoe. One person may own more than one canoe; 'as many as his pocket can buy'. If the canoe owner or net owner (who may not be the same person) do not themselves go to sea, they appoint a 'bosum (boatswain, corruption of 'bosu'n' ¹³). In Ghanaian canoe fishing the word refers firstly to the owner of the net and secondly to the owner of the canoe and net. In the past when it was more common for

the net and canoe owner to join the fishing himself he would command the crew and be the bosum. Today the canoe and net owner is increasingly replaced by a second in command. If, apart from the outboard motor, the crew own either the canoe or net, then the person owning the net or secondly the canoe will be the bosum; since without his individual ownership the crew could not be constituted and could not become the collective owner of a motor or canoe or the gear. There are no figures available which could show this relationship between the canoe owners, net owners and those who work the canoes.

It is the acting bosum's task to select a crew; in the fishing villages the crew member's performance is now considered to be of more importance than ascriptive criteria like kinship or friendship. Today there is greater supply and demand of fishermen and the recruitment of crew is more open. A bosum may ask an experienced and able fisherman to help him choose the selection of crew members. Once formed the crew on an ali poli canoe may stay together and work as a team for several fishing seasons. Occasionally crews are reshuffled when new canoes are required, but generally the crew continue in their established composition.

It is the bosum who notifies the crew of the times they will go to sea and the duration of each trip and he has ultimate command on board the canoe. All conflicts among the crew are settled by the bosum or taken to the chief fisherman. Once back on shore the crew members are free to criticise the bosum's navigational and fishing decisions. With the exception of the youngest members of the crew, if they are taken on board, all crew members are from the same background, equally trained and often of

similar ages. The decision on which fishing ground to go to is made by the bosum but it is the crew's authoritative decision on any modification made to the number and length of the fishing trips undertaken in the hope of increasing the catch. The bosum will not succeed without his crew's co-operation and a larger catch results in a proportional increase in the crew's share of the fish. 14

The sharing of the catch is made to a predetermined formula used in Ghana since the introduction of the ali net. The labour of the crew is not purchased in exchange for a money wage; instead the crew member is remunerated with his share of the catch and often the processing and selling of his share is his own responsibility. The share will fluctuate seasonally depending on the size of the catch and the selling price of fish on the open market. If there is no catch from a poor fishing trip or the canoe did not go to sea for any reason, the crew have no income for lost fishing days. The sharing system not only divides the product but shares the risks of production between the capital owner and the primary producers, the crew. Canoe fishermen today believe that they are all equal and the bosum is a member of the team like anyone else, even though he may receive a larger share. The crew treat ownership of the canoe, net and motor as fairly incidental, and consider the one share for the canoe and two shares for the net as shares for the instruments of their labour rather than directly to the owner of the canoe and net. All members of the crew are aware that once the catch has been landed and shared, they, along with the bosum, face the same task of getting the fish processed. 15

With the introduction of the outboard motor to the canoe fleet, the share of the catch became more complex, mainly due to the high cost of the loans taken out to purchase the outboard motors. With ali poli fishing there are larger canoes and nets with much higher reproduction costs demanding more shares from the catch, i.e. a variable number of shares for the outboard. There are also two or three shares for the fuel and running costs of the outboard which are called 'petrol fish' (fish with which fuel is purchased) ¹⁶. Today the share system and its subsequent changes are deemed to be detrimental to crew members, as the total catch is to be divided into many more shares, thus there is less income for each member of the canoe's crew.

The non-crew shares make more money available for the payment of bank and private loans, consequently accenting the hierarchical tendencies within the industry. There are several credit facilities open to canoe fishermen. Two major financial institutions provide assistance to the canoe fisherman of Ghana:

- i) The Agricultural Development Bank, established in 1965 which has branch officers in several fishing communities, facilitates credit for the development of agriculture and related industries.
- ii) The Rural Bank; a division of the Bank of Ghana was set up in 1976 for both the credit of rural industry and to mobilise savings. Again branches of the bank are set up in major fishing communities. ¹⁷

However, for many canoe fishermen, a large share of

the credit available to them is provided by female entrepreneurs known as the 'fish mummies', who provide a more flexible deal than that of a bank. In return for the informal loans the fishermen are obliged to hand over their catch to the mummies who help finance their canoes and gear. The Ghanaian women's relative economic independence has been attributed to the kinship system where there is a distribution of work and income between husband and wife. ¹⁸ This helps to maximise their earnings from fishing. The wife's independent earnings enable her to provide banking functions which act as a buffer between the fisherman and indebtedness. Nevertheless, the fluctuating nature of fishing ensures a high proportion of defaulters on loans and a consequent concentration of canoe ownership in fewer and fewer hands.

People outside the canoe fisheries who belong to the fishing community, such as artisans, traders and drivers, may invest in canoes and nets, but not actually go to sea themselves. This form of ownership of a canoe is considered a good and proper investment for surplus money and is seen as a sign of respectability, showing the owner to be creditable enough to provide a livelihood for other people. It also provides the owner with a means of making a living during a period of unemployment.

Changes in canoe design thus have serious social and economic ramifications throughout the artisanal sector. This is not least because for every fisherman there is a woman onshore waiting to process the catch. The trend has been towards larger boats, requiring larger crews. As these grow fewer in number due to depletion of timber reserves, this trend will reverse with a consequent impact on

the male and female labour market.

2.5 Fish Processing

There is a well defined clear cut sexual division of labour between the fishermen and the fishwives who take over the processing and selling of the fish. Generally when a canoe is operating from its home fishing village each member of the crew will have his own fishwife who may be his wife, sister or mother and he may even have more than one wife relying on his share of the catch. The estimated number of women involved in the artisanal fisheries is equal to the number of men absorbed in the canoe fishing industry.¹⁹ There appears to be several methods of disposing of the catch to fishwives. The most straightforward procedure, when the canoe is operating from its home landing beach, is for it to be met after each fishing trip by the fishwives who then take their man's share, directly given by the bosum into her aluminium basin. Women are considered a separate economic entity (a fish trader) unlike their fisherman partners.

When the canoe is not met by related fishwives, the bosum organises the selling of the catch to fish mammies, most of whom form an attachment to particular canoes and again will meet the returning canoe at the beach. The fish is sorted into species; larger more valuable fish are sold separately, while smaller fish like herring are sold by the basket.

No matter how the fish are acquired by the fishwives and mammies, it is the women who exclusively process and market the fish; a small percentage of fish will be sold for fresh consumption, the rest is preserved

by drying, smoking or salting.

The canoe is the focus for the entire commercial exchange of the fish; without it trade would become concentrated in formal markets and the social infrastructure which underpins the exchange would be irrevocably altered. I saw this complex set of socio-commercial inter-relationships take place at Elmina and had the bewildering events explained to me by the Area Fisheries Officer. As soon as the canoe is dragged up the beach it is met by the fish mammies and the fish for sale is piled up on plastic sheets. The bosum usually has a secretary, who may not have gone to sea but will keep account of the fish sold (often this is a mental note). The formal bargaining for measured baskets of fish commences between the bosum and one of the mammies; she is well aware of the general feelings about market prices which her sisters are prepared to meet. The bosum then names his starting price and the women answer by stating theirs; the bargaining proceeds and quite often heated arguments take place. Hill wrote that "to an outsider the whole process appears threatening, until after an exhaustive bout of bargaining a price is fixed".²⁰ The bosum hand-scoops the fish into his basket which is then placed into the fish mummie's basin where the customary 'dash', an extra amount of fish, is added by a given number of hand scoops. The fish mummie pays either the bosum or his secretary and the whole deal is conducted so quickly that the change is often paid back once all the fish are sold, even if this means change returned later that day. To a bystander the whole system of fish selling seems a little disorganised and unfair, given the irregularity of the quantity of fish per basket. Within the canoe fishing sector no written accounts are kept of

fig. 5

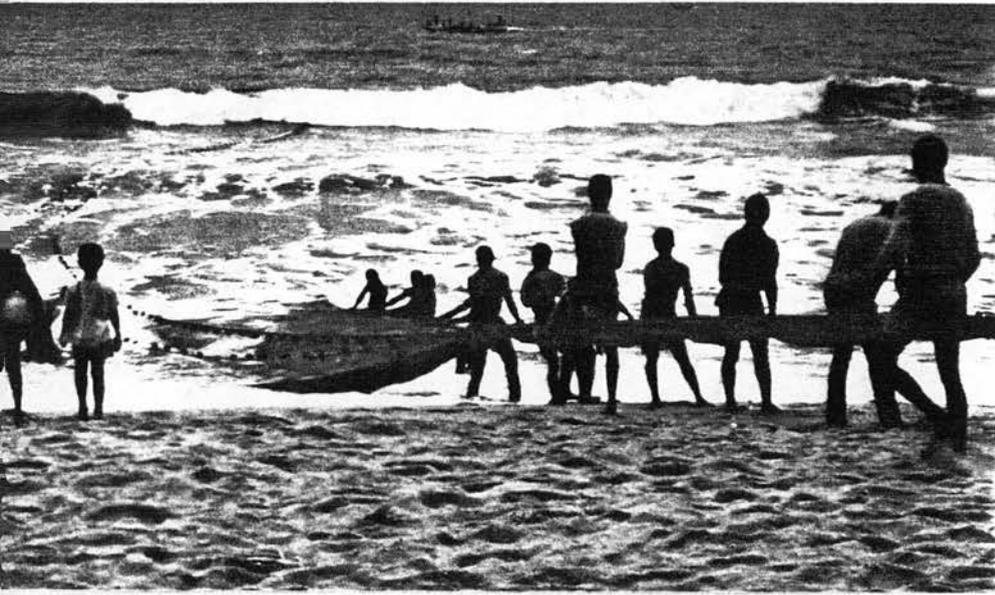


fig. 6

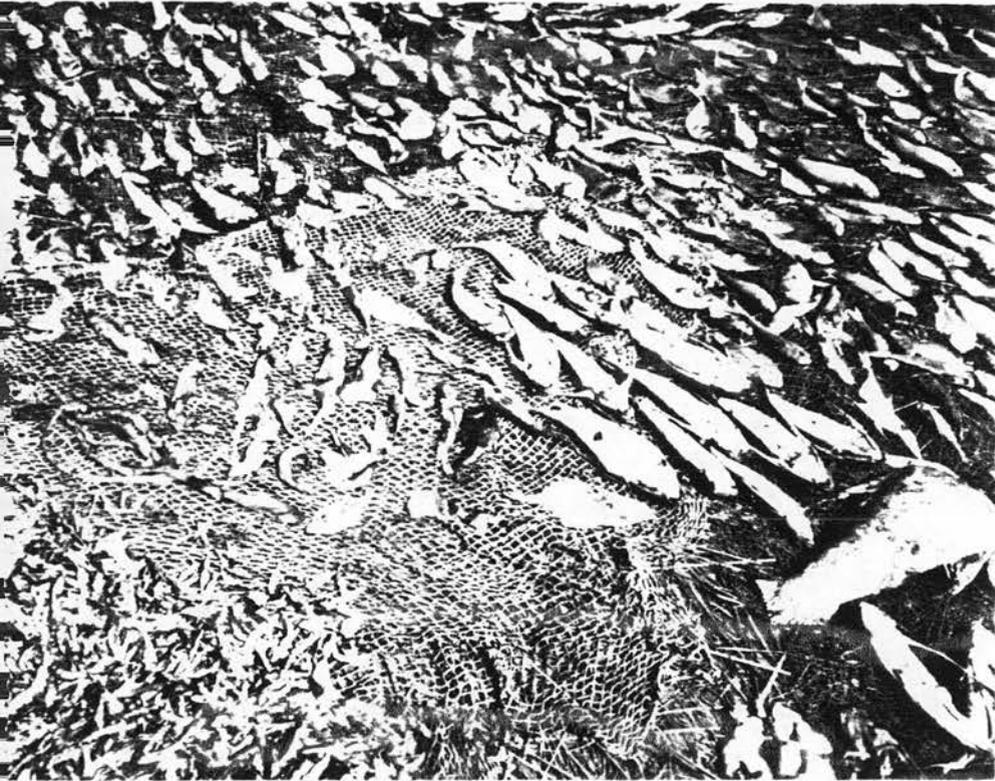


fig. 7



individual catches, although the bosum and his secretary seem to know the quantity of fish caught and sold on return from each trip. If the mammies have a good relationship with their canoes they are able to work on a system of credit which they settle weekly or at pre-arranged intervals.

The traditional systems in use in Ghana today for catching, processing and marketing fish are deeply rooted in the people's social structure and work adequately well, given existing economic conditions. Both the canoe fishermen and fishwives have a part in the control over fish production, although it is the women who make the necessary exchange value for the fish, and it is the processing and marketing of the fish which are the essential elements in the preparation of fish as a saleable commodity. The systems used for processing and marketing of fish are flexible and capable of absorbing considerable quantities of fish during the bumper seasons and yet still make protein available to the people of Ghana during the lean seasons. It is this traditional and flexible system which is threatened by impending changes in canoe size, design and availability.

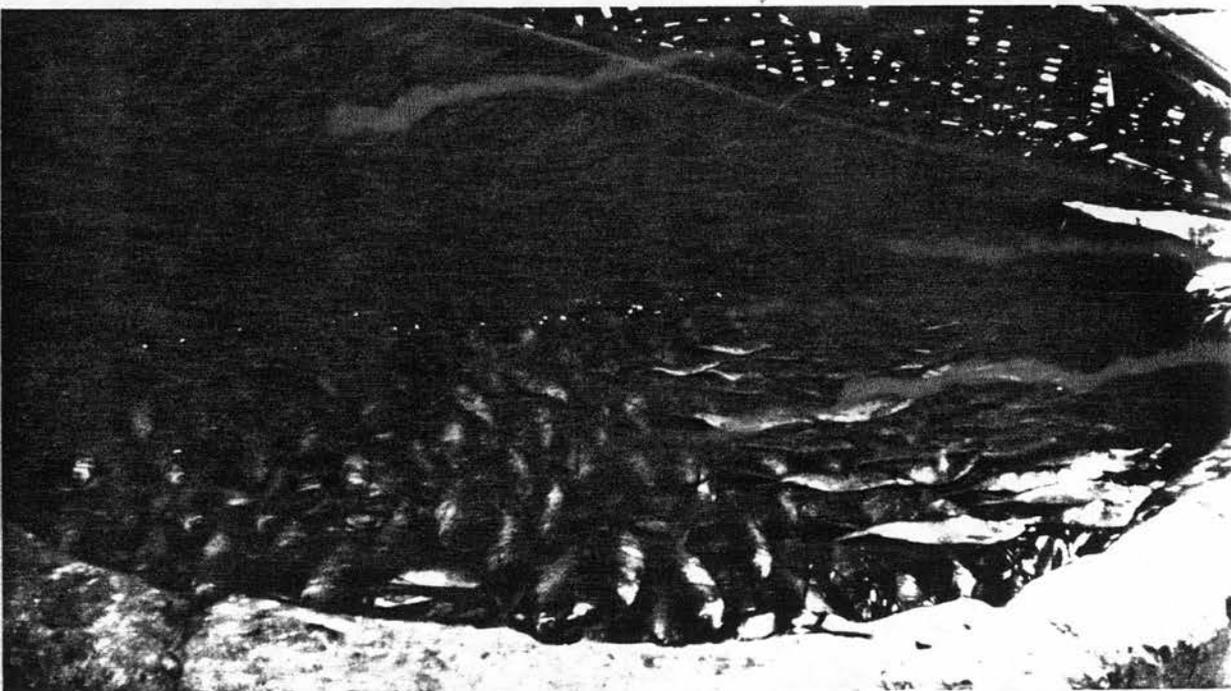
2:6 Fish Preservation

The three main methods of preserving fish in use in Ghana today include:

1. Sundrying (fig 6), which removes the water content in order to destroy the autolytic enzymes that result in the growth of bacteria. This process must be done as quickly as possible. The most common method is to lay the fish either directly on the ground or on plastic sheets; the fish are then regularly turned for



fig. 8



about one week. This method is suited to small pelagic fish, such as sardine, small horse mackerel, bumper, burrito and shad. While the cost of sundrying is low, there are significant losses due to spoilage from contamination by dust and insect infestation. Fish dried in this method will keep for about six weeks. ²¹

2. Salting is a process on the decline in Ghana due to the high cost of imported salt. The method of salting is suited to large fish like shark, grouper and snapper. The most frequently used method is to gut the fish, remove the scales and rub salt into the inner and outer flesh. After this the fish is sundried for a couple of days then packed (fig 7) into barrels or boxes ready for transportation. ²²

3. Smoking, either hot smoking or cold smoking, is particularly suited to oily fish and a great variety of other fish. Again the process must begin as soon after the fish is landed as possible. Large fish are gutted and cut into steaks while most fish are smoked whole. Fish are washed in clean water, fresh or salt, and often sundried for an hour before being smoked in one of two types of oven commonly used in Ghana; the traditional circular oven (fig 8) or the improved 'Chorker' oven. The fish are laid on drying racks or trays and the trays are stacked on top of each other; the uppermost tray is covered with palm frond and corrugated tin sheet, thus creating a smoking chamber. The fire for the cooking phase is made of hardwood which produces a temperature of about 80c in the fire chambers, for about an hour for each of the trays, which are rotated. The final smoking

procedure requires a fire made from sugar cane, coconut husks, sawdust or grass which provide plenty of smoke at low temperature and give the desired colour and flavour to the fish. Depending on the fish species and intended length of time the fish are to be stored, the smoking takes from two hours to two days, producing a moist versatile product which, depending on the temperature and time smoked, can last for several months. If the fish are resmoked they can last up to nine months in the tropics. ²³ Smoking is the most common method of preserving fish in Ghana, since the distribution process of fish to market places in distant parts of the country can take several days.

2:7 Fish Marketing

The marketing of fish is solely in the hands of women; the processed fish is packed into cane baskets or wooden boxes made locally by the fishermen, wives or members of the fishing community. The women prefer to sell the fish in large quantities and when the price of fish is at its highest during the lean season when fish are scarce. As the price for fish is proportionally higher the further away from the coast, the fish mummies will either individually or collectively hire a truck to transport their fish to markets away from the coastal villages. During bumper seasons there is very little demand for smoked or dried fish along the coast so the price is only slightly higher than fresh fish even though smoked fish is twice as concentrated in terms of nutritional value. During the lean season far up country away from the coast, the price of fish may be more than five times the

value of the fresh fish at the time of purchase from the fishermen. ²⁴ Most of the women do not keep written records of the hours of labour involved in the processing of their fish or the price involved in material costs.

With large quantities of fish the mammies operate through their own marketing agent, who is also a woman. If the fish is to be sold through an itinerant wholesale agent the fish mummie does not have to go to market in person to accompany her baskets of fish. Instead the price she requires for the fish is indicated by the number of small beads, pebbles, corn or other suitable counting material tied in a piece of cloth and placed in the basket of fish. The baskets have identification marks known to the mammies, the agent and the driver who delivers the fish. Once the fish is in the hands of the agent it is within her interest to continue to resmoke and redry the fish to minimise deterioration, until the whole consignment is sold out to other fish market woman who actually sell the fish to consumers. A fish mummie will periodically travel to visit her agent to close her accounts. ²⁵

More than half the fish produced at the coast is transported to distant markets in the interior of Ghana or to neighbouring countries where smoked fish is in great demand as the only source of protein that many low budget families can afford. For small quantities of fish, the fish wives and fish mammies will carry a few baskets or basins by public transport to markets where she will wholesale or retail the fish herself. Or she may prepare a headload of fish, fresh smoked or dried on a circular wooden platter, and walk to a nearby market to sell the fish.

PART II

CHAPTER 3

A FIELD STUDY OF CANOE CONSTRUCTION: THE FOREST PHASE

3:1 The Carvers

The canoe carvers operate in what the Forestry Department define as the 'Unreserved Closed Forest Zone' in the Ashanti, Brong Ahafo, Central and Western Regions. As the carvers work in remote locations they are accountable to no-one and there is no official monitoring of the canoe carving activities within Forestry Departments. ¹

Knowledge of where canoe carvers might be operating is of necessity gained by 'word of mouth'. I learnt of a canoe carving company's operation in the Desere Reserve in the Ashanti Region from vehicle drivers in the Kumasi Forestry Commission car park. I hired a car and took along a translator, who was able to guide me through the protocol involved in locating the carving company. He also helped me with the translation of local dialect and terminology used in canoe carving.

It is the tradition for specialist canoe carvers from the coastal community of Pram Pram to carry out the first phase of canoe construction in the forest. It is widely believed that the carvers learnt their skills from 'Fanti' fishermen in the 19th century. Many fishermen and carvers adhere to the story that: 'Over a hundred years ago, seafaring canoes were obtained from the Fanti people in the Western region of Ghana; around 1870 a fisherman from Pram Pram in the Eastern region travelled with his son to the forests in the Western region to learn the skills

involved in canoe carving from the Fantis. Once the two men proved they could successfully build their own canoes, other fishermen from Pram Pram were encouraged to learn the construction process. ²,

Pram Pram is now the established centre for the people involved in the first phase in the construction of coastal canoes. There are no official figures compiled for the number of men involved directly with carving canoes in the forest zones; however, the figures of approximately 400 to 500 men are given by two individual carving companies. Coakley stated a figure of plus or minus 600 men, using information from a census taken among the canoe carvers in August 1982, when many carvers return to Pram Pram for annual festivities which coincide with the rainy season which prohibits work in the high rain forests from June through to August. The company I followed were predominantly from Pram Pram and were titled the K.K. Company, taking their name from the team's Master Carver, Kwabina Kabu. ³

3:2 The Carving Company

A canoe carving company usually consists of between four and thirteen men, comprising a blend of experienced carvers and apprentices. If the company has a large number of men, they may divide into teams of four to five men who work on individual canoes. A company is headed by the most experienced carver who is known as the 'Master Carver'.

As with the fishermen, canoe carvers are often inter-related, and where possible a young man from the Eastern region aged 16 to 20 will apprentice under a family relative, or his father will approach

a Master Carver to take his son as apprentice. If the master accepts the young man as a member of his team, the father will pay the master one bottle of schnapps and a sheep or goat. The young man will commence his apprenticeship with an initiation ceremony of libation poured on his forehead. He will then begin work by carrying tools and cooking for the carvers in the forest, generally helping out and learning the skills involved in canoe carving. He may remain an apprentice for two or three years; the time taken to learn the trade. A team usually has two apprentices, who each cost the master c600 to c650 per day to keep; this figure includes the c200 to c300 spent on their daily food, the rest of the money goes to the apprentice himself.

Within the K.K. Company, the Master Carver, aged about fifty, learned his skills from his father; the master has a younger, experienced member of his family working alongside him who is in his thirties. Two apprentices in their early twenties have worked under the master for two years. A chainsaw operator completes the carving team; he is the only member of the team to have come into canoe carving in later life from the timber industry. In the mid 1980's he came to canoe building but was already an experienced chainsaw operator and was often hired out from the timber merchant to fell trees for canoe carvers and carry out the stages of construction which utilise the chainsaw. On joining the K.K. team he learnt the skills involved in the use of hand tools for the roughing out of a dugout and has thus become a valuable member of the carving team. The K.K. team own their own chainsaw as this saves both time and money which they previously spent on hiring from the timber merchants; a secondary benefit is that they are now able to hire out the

services of chainsaw and operator for their financial gain.

The carvers are migrant workers who specialise exclusively in canoe construction. They scout the forest reserves to locate an area with sufficient trees to allow them to settle in that area for at least a year. They arrange to rent rooms in the nearby villages where they will spend the greater part of the year. The carvers who have immediate family fetch their wives, who farm locally while their children go to school. The profession of canoe carving remains a pursuit of the coastal people, as the local people in the forest areas have no interest in learning the skills of the migrant carvers. As the carvers have to spend most of the year in often quite remote forest areas, they maintain connections with their fishermen customers by sending company representatives down to visit the coastal communities. The carvers are also contactable through agents or relatives living permanently in Pram Pram, thus allowing the fishermen to place an order for a new canoe with the carvers.

3:3 The Timber

The large coastal canoes are made exclusively from the tree *Triplochiton Scleroxylon*; Wawa is the common alternative standard name for the tree and its timber in Ghana. Wawa is widely distributed throughout the deciduous forest reserves of Ghana and is one of the most common timber trees available. At maturity the trees reach a height of 45 to 55m, with a narrow buttress that extends up to 6m up the straight, cylindrical bole. This bole is free from branches up to 25m and the diameter above

the buttress can be as great as 2.5m. The sapwood is between 5 and 10cm wide with no clear distinction between the sapwood and the heartwood. When cut the wood is creamy white to pale yellow in colour, it has a rather open texture with an interlocked grain that is moderately coarse but even. The cut wood has a strong odour which disappears on drying. Brittleheart may be present in large logs and the older the tree becomes the more susceptible it will be to heartrot. Wawa has a weight of 380 kg/m³ at 12% moisture content, and specific gravity of 0.39.

The Wawa is classified as a non-durable hardwood; it is not resistant to decay or stains by fungi. The sapwood is liable to attack by powderpost beetles whilst the wood is reported to be non-resistant to West African termites. Freshly felled logs are also extremely prone to attack by pinhole borer beetles. The heartwood is said to resist preservative treatment. Although the wood is described as a hardwood, it is easily worked with both machine and hand tools. The wood is quite firm under tool but does not blunt cutting edges of tools very quickly. When end grain working the timber may show a tendency to crumble and to avoid this the tools must be kept sharp. Wawa dries well with little tendency for the worked wood to split or for existing shakes to extend, although very slight distortion may occur and knots tend to split a little. ⁴

Biologically there are no male or female Wawa trees, although Ghanaian people do consider that the difference in colour is associated with gender of the trees; the lighter colour being female and the yellow wood male. There is some discrepancy as to the preferred wood for the construction of canoes; both are considered suitable for canoe carving by

fig. 9

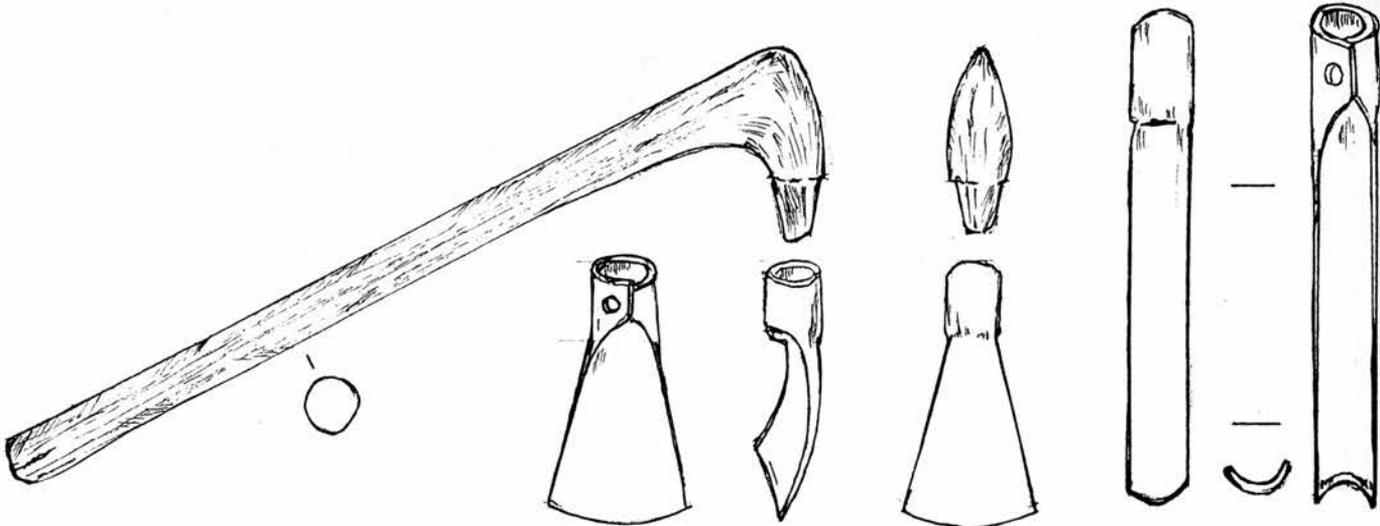
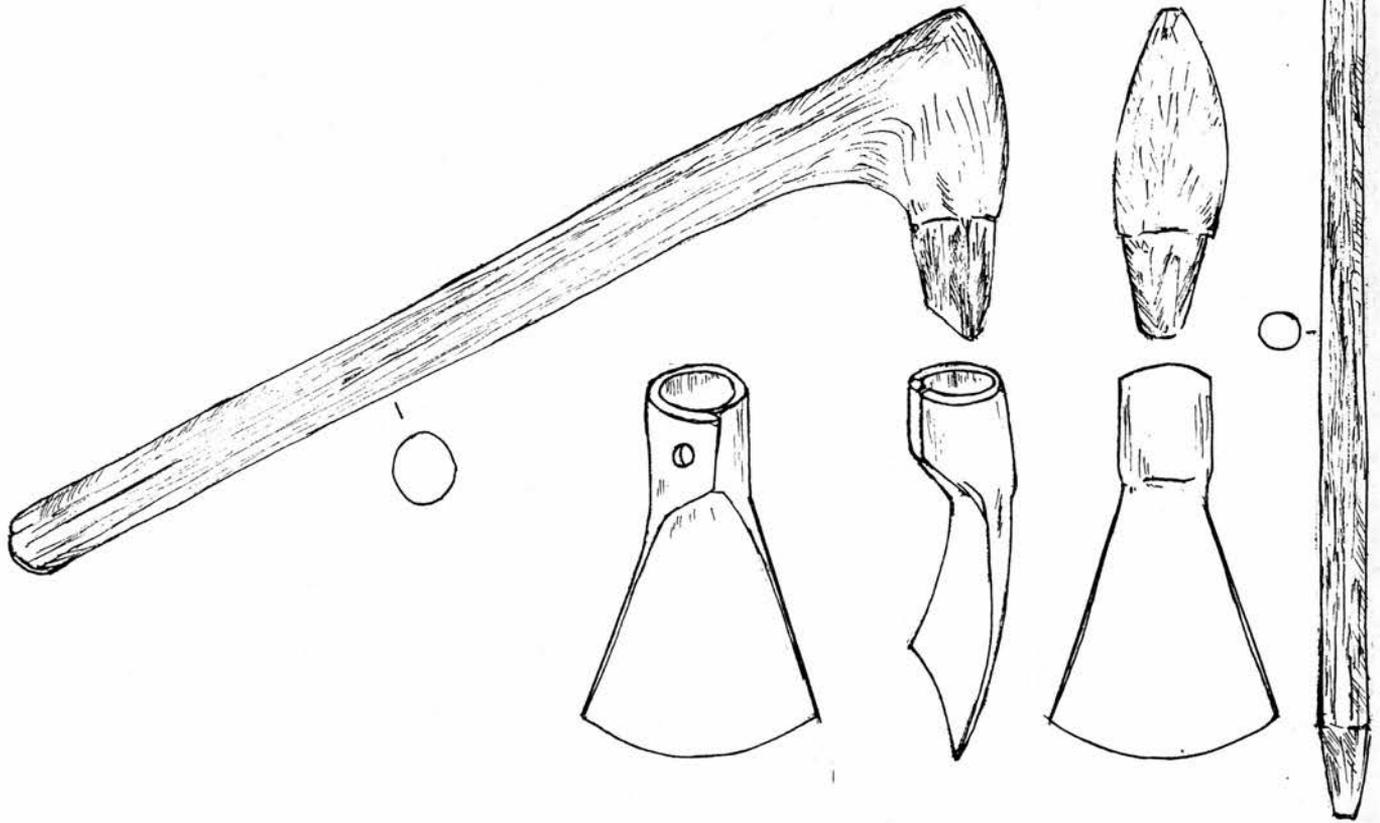
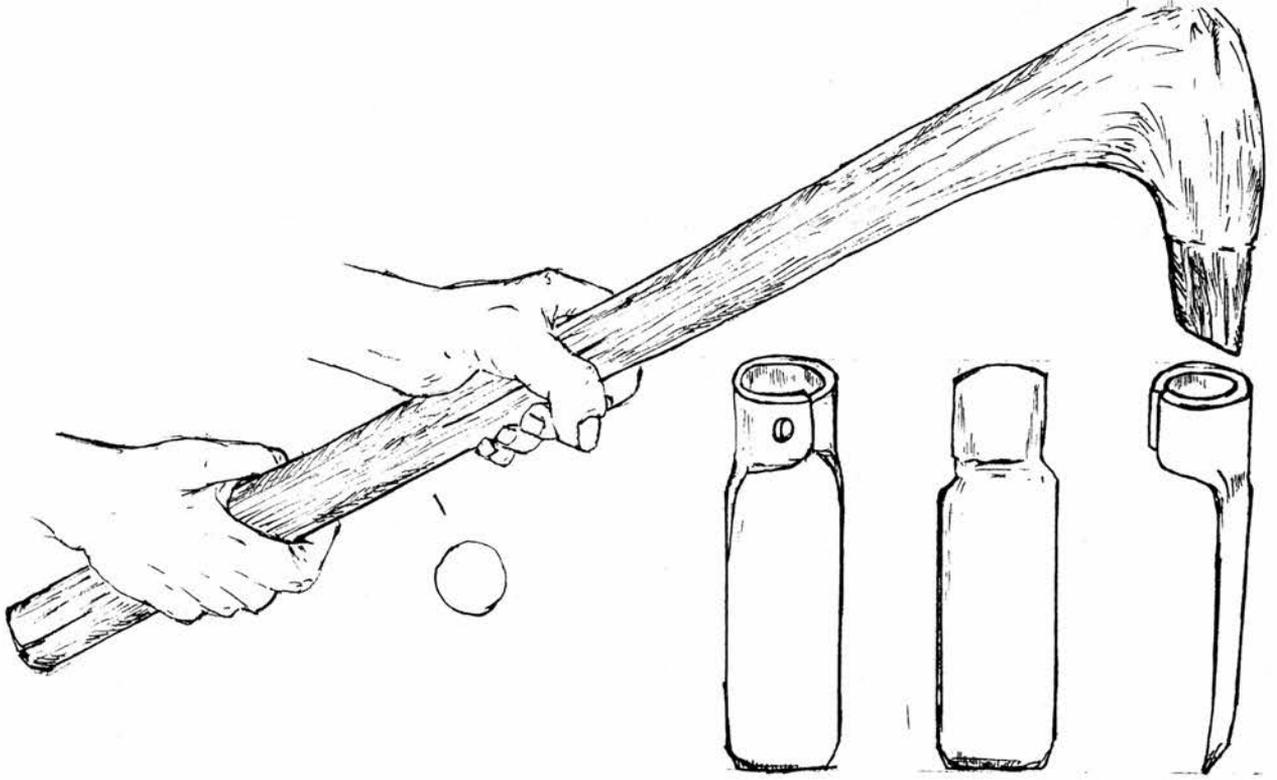


the carvers and fishermen. 5

3:4 Tools used in the Forest Phase of Construction

The only machine tool utilised in the construction of the dugout canoe is the chainsaw; both Dorma and Stihl are imported into Ghana for use by timber merchants and canoe carvers. A model commonly used by canoe carvers is the Stihl 070/AV/16 with a chain bar length of 97cm. In 1989 the above chainsaw cost approximately c350,000. On average a chainsaw will last a carving team up to four years if properly maintained. Fuel and running costs, however, are high, with a gallon of fuel costing c3,500. A team of carvers will require three or four replacement chains during one year of tree felling and carving. A new chain costs c15,000. As both are only available in Kumasi or Accra, there are problems in obtaining spare parts and chainsaw fuel. 6

With the exclusion of the chainsaw, only five types of hand tools are used in the entire hollowing out process. The 'Cutlass' (fig 9) is a tool carried by most agricultural workers in Ghana, and is therefore easily available and relatively cheap to buy. The cutlass is manufactured in Ghana and is a tool generally used for ground clearing, cutting creeper vines and marking the bark of the logs. Three different size and shaped adze heads are used in the hollowing process; Tatawa, Ome and Sankuma (as pronounced in the Ga dialect). The adze are either made from imported steel or from the reconstituted steel of truck leaf springs. The wood used for the stocks or handles of the adze are commonly made from any of the following tree species; Pinimo, Sesedua, Omenewa, Sanga, Satinwood, Danta or African



Mahogany. ⁷ The stocks are either purchased locally or made by the canoe carvers themselves.

'SANKUMA' (fig 10): The Sankuma is a straight sided adze with a flat cutting edge and is used to remove the bulk of the wood during reduction.

'TATAWA' (fig 11): The Tatawa has the broadest head with a curved cutting edge and is generally used for chipping bark from the log and for finishing the surface of the wood.

'OME' (fig 12): The Ome is used to remove the wood from the bow and stern of the canoe, and is similar in shape to the Tatawa but smaller.

'TEE' (fig 13): A long handled gouge, named a Tee, completes the set of hand tools used to finish the dugout stage in the canoe making process. Again the Tee is made from imported steel or recycled from trunk leaf springs. It is used to trim the straight sides externally below the sheerline of the dugout.

Although there are only four hand tools used to carve the dugout the carving teams will carry several of each adze and usually only one Tee. The cost of the adze heads is between c2,000 and c4,000 depending on the quality of the steel. The gouge costs approximately c1,500. The carvers sharpen their hand tools with a file and carborundum stone.

3:5 Ordering a Canoe

The process involved in placing an order for the canoe was explained to me by both the K.K. Company and the head of the Canoe Fisherman's Council. ⁸
If the canoe is to be the first canoe the fisherman

has ordered and he has no attachments to a carving company, he may seek guidance from his chief fisherman as to whom he should approach to build his canoe. All the canoe carvers attempt to maintain a high reputation and welcome new customers, particularly those who are able to pay for a canoe. If the canoe is to be a replacement for an existing canoe, the fisherman may return to the same company to construct the replacement, or he may have found a company who hold a reputation for building superior dugouts. The fisherman decides that a new craft is necessary when his present canoe is seen to be 'slowing down'. Although still seaworthy, it may have undergone many repairs and patches, but he will always try to order a replacement canoe while his present one still has a limited working life, thus enabling him to continue fishing whilst the new dugout is ordered, constructed and fitted out; a process which can take several months and requires a considerable amount of money. This is the carver's side of the story; the fishermen have other ideas about how difficult it is to get a canoe company to complete an order.

The prospective client meets with the master of the canoe carving company, either at the coast or in the forest area where the chosen carvers are operating. Fishermen are prepared to travel to the forest area in order to meet the carvers in the hope that their order may be taken and work gets underway more quickly. The Master Carver and client discuss the specification for the proposed canoe. Consideration is given firstly to the dimensions of the dugout, the priority being the width and depth and secondly the length; the actual measurement is expressed in feet and arm spans respectively. Attention is given to the type of landing beach or sheltered harbour

from which the canoe will operate and other details of the canoe's intended use such as the type of fishing gear the canoe will carry.

The two men will reach a fairly loose agreement on the final cost involved in the construction, taking into account material costs, labour and fuel expenses for the chainsaw. The client will pay a variable amount of money, possibly around c40,000, as the initial downpayment on the dugout. Great reliance is placed on the deposits paid by the prospective buyer because initial expenses including the acquisition and felling of the tree are met out of this deposit. If during the felling process a tree splits or is rendered useless for the purpose of constructing the canoe, it is the carver's resources that are utilised to acquire another suitable tree. All canoe carvers operate under financial constraints since because they have no permanent workshops, the banks of Ghana are unwilling to help finance the carver's business. 9

Canoe carvers generally do not keep written accounting records, although the K.K. Company showed me a piece of paper relating to the accounts of a canoe presently under construction. This showed the amounts of money already paid by the client; there were no dates against the entries and no account of the actual cost incurred by the carvers. Payments were in blocks of between c30,000 and c70,000 and the total paid was c350,000, whilst the canoe was about half completed to the dugout stage. The carvers were not expecting further payments until the dugout was completed and ready to be removed from the forest. The K.K. Company commented that this client was a good payer and this was his second canoe made by the K.K. team in five years.

Once the order is placed and the deposit paid, the client will return to the coast. Occasionally he may leave a person to act as his agent who will transfer amounts of money on demand from the carvers and ensure that work progresses on the canoe. Better communications between the client and the carvers will safeguard against the canoe being sold to another client.

3:6 Assessing the Timber

When the order for a canoe is placed, the Master Carver will go into the forest reserve to locate a suitable tree. This task is becoming increasingly difficult as of the 28 listed forest reserves, no fewer than 12 (42%) of them have no large Wawa trees at all and 18 reserves (68%) have no trees remaining of sufficient size for the purposes of ocean canoe building.

Table 3

The source of table 3 is the result of UK/Ghana Forest Inventory Project carried out by the ODA, Kumasi Forestry Commission. The table shows the occurrence of large Wawa stems inventoried in Ghana between 1986 and 1988. The trees counted were measured diameter at base height - dbh. The trees measured are shown in two columns, those of 1.50 and above or 1.65 and above. The first column shows the number of hectare plots in the forest reserve. The second column shows number of Wawa per hectare. The third column shows the number of Wawa per square kilometre. The final column shows the size of the forest reserve measured in hectares.

Table 3

Forest Reserve	No of 1 Ha Plots	No/Ha	No/km ²	No/Ha	No/km ²	Area of Reserve in Hectares
Afram Headwaters	50	1	2.00	0	0.00	20,114
Aiyola	25	1	4.00	1	4.00	10,345
Amama S'belt	12	0	0.00	0	0.00	4,403
Angoben S'belt	8	0	0.00	0	0.00	3,465
Anum Su	10	3	30.00	3	30.00	5,947
Asenayo	57	6	10.53	1	1.75	22,792
Asukese	63	1	1.59	0	0.00	27,014
Ayum	30	5	16.67	4	13.33	11,285
Bandai Hills	36	0	0.00	0	0.00	15,563
Ben Group	69	0	0.00	0	0.00	27,280
Bia South	59	7	11.86	0	0.00	30,562
Boin River	75	2	2.67	1	1.33	27,752
Buri River	25	0	0.00	0	0.00	10,482
Dome River	14	1	7.14	0	0.00	8,050
Fure Headwaters	41	0	0.00	0	0.00	16,960
Krokosua Hills	115	23	20.00	10	8.70	38,767
Mamiri	11	0	0.00	0	0.00	4,535
Mpameso	86	3	3.49	3	3.49	32,256
Nkrabia	26	2	7.69	0	0.00	10,031
Oda River	39	1	2.56	0	0.00	16,420
Pra Anum	31	3	9.69	1	3.23	13,289
Subin S'belt	8	0	0.00	0	0.00	2,250
Tain Il	101	0	0.00	0	0.00	50,920
Tano Anwia	36	0	0.00	0	0.00	15,310
Tano Suhien	22	0	0.00	0	0.00	8,440
Tano Suraw	26	2	7.69	2	7.69	10,360
Tinte Bepo	28	0	0.00	0	0.00	11,556
Yoyo River	57	1	1.75	0	0.00	23,569

It is unlikely that any trees in Ghana will grow to a diameter over 1.50m again; timber merchants use trees of only 70cm diameter. There is no data on the growth rate of Wawa available for Ghana, as the trees grow in seasonal spurts. Linear growth has been poorly charted over the last few years and is unreliable. ¹⁰

The most up to date estimate for the number of trees available to the canoe carvers over 1.65 has been given as 29,000 stems. ¹¹ Although there will be little competition from the timber merchants for the large trees as there is little financial gain in the transportation of a single log compared to three smaller logs carried per lorry, the narrower diameter logs tend to be in better condition and more sought after for export and by the saw mills in Ghana. ¹² Although there are a possible 29,000 trees left in the reserves, there are problems of accessibility to the canoe carvers as many timber merchants do not want carvers working in forest reserves which they are operating. The locality of the remaining trees will result in the carvers having to travel further in to forest reserves to work on canoes and this will add to the transportation difficulties along with damage to the completed dugout canoes as they are dragged to distant roadsides.

It has been estimated by FAO Fisheries Development Officers that the canoe carvers use approximately 1,000 logs per year for the construction of canoes, 600 of which are used to build large canoes over 15m in length for both the Ghanaian fleet and to export to neighbouring countries. Therefore potentially there are enough trees left to sustain the present canoe building industry, but this would only replace

the existing fleet and not allow for expansion to the fleet.

There appears to be unanimous agreement amongst carvers that it can take a couple of weeks of walking the forest to locate a tree. ¹³ The K.K. Company are presently working in the Desere Forest Reserve, between Kumasi and Sunyani. The K.K. carvers rent rooms in the nearby village of Mpasaso which is a cocoa producing area. The carvers walk four kilometres daily along a single dirt track road to the Desere Forest Reserve and a further four kilometres along a footpath cleared by carvers. The path climbs to an altitude of 300m into the protected closed canopy forest typical of the remaining Tropical High Forest zones, where the present canoe is under construction. The Forestry Commission check on the number of trees being felled in the reserve. As yet no timber merchants have been into the part of the reserve where the carvers operate, and it is considered by the Forestry Commission to be 'near primary forest'. ¹⁴

The master of the K.K. team had already 'earmarked' a number of suitable trees within the Desere Reserve to make the task of finding trees to meet forthcoming orders easier. Undoubtedly this task is affected by the diminishing resources in the unreserved forest zone and the extraction rate in the reserved forest zone is now approaching its renewable resource ceiling.

3:7 Selecting a Tree

When selecting a suitable tree for the construction of a dugout canoe, the carvers rely on sight to judge a healthy tree and to determine its size. A

tree with about 30m of straight bole between the buttress and the crown is the preferred size for the construction of a large ali poli canoe plus a smaller size canoe. A second canoe from one tree is considered a bonus that makes up for the number of trees felled at the carver's expense which prove to be unsuitable for canoe carving. In the time it took the K.K. Company to build 15 canoes they had found only one to be rotten and one tree was felled whose size had been over-estimated for the ordered canoe. This seemed an exception as other companies, expressed in Coakley's report, felled as many as six trees before one was found to be suitable for the intended large canoe.

Once a suitable tree has been located in a forest reserve the carver has to obtain permission to fell the tree. Permission can take up to six weeks and Robert Bamfo of the Forestry Commission in Accra explained to me how a canoe carver legally acquired a tree from the forest reserves.

"Once the team of canoe builders has selected a suitable tree to build a canoe, they approach the District Officer of the Lands Department for the area where the tree grows. In order to obtain a permit to fell the tree, a canoe builder must show the chainsaw operator's licence (all chainsaw operators must demonstrate that the chainsaw is in good working order and that they are competent to use the chainsaw. A small fixed fee is paid to cover the administration of the licence). This is accompanied in league with the Forestry Department, who identify where the tree is growing and the number to be felled for the purpose of canoe building in a particular area. The canoe builders only obtain permits when the tree is outside of an

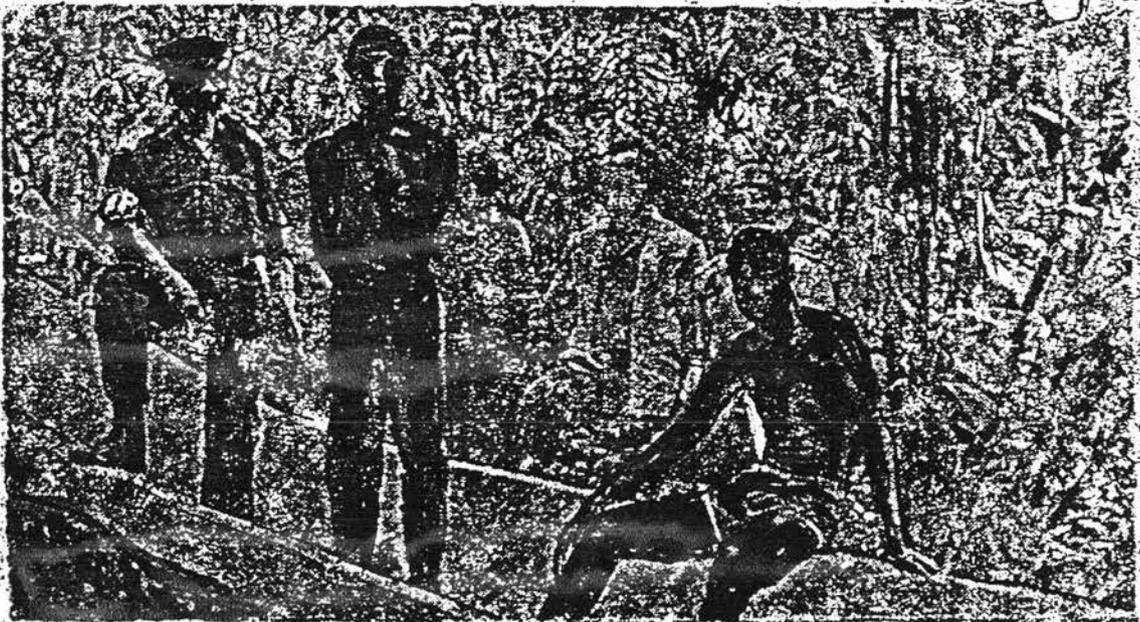
area which is forest reserved, i.e. in the Lands Department land.

Timber merchants obtain a 'concession' to operate within a forestry reserve; in the case where the chosen tree for the canoe is growing in a reserve being operated by a timber merchant, the canoe builder approaches the concessionaire (the person who owns the concession and has the rights to operate legally in the reserve). The royalty fee paid for each tree is at present c6,500. If the tree is in the forest reserve, the fee is paid to the Forestry Department. If the tree is outside the reserve, the fee is paid to Lands Department. Most concessionaires have in mind the export price of the tree, so they arrange a price for the tree with the canoe builder based on the export price which inflates the price of one tree as high as c70,000".

Robert was aware that most canoe builders operate illegally and do not have a concession; they just take the tree and hope that no-one notices. The legal process is very difficult for canoe builders to satisfy with costs, transport and literacy problems. The Forestry is revising new royalty fees, which will be increased to cubic content instead of flat rate for a tree. The rate was increased from c2,000 for one tree to c6,400 on 1st January 1989. The Forestry are planning to make things easier for canoe builders to obtain trees, as their operation is considered small scale and they utilise trees that are only suitable for canoe construction. The Forestry are considering allowing canoe builders to salvage logs from roadside accidents to avoid situations where a log will lie on the roadside and rot. The main culprits in the forest are the chainsaw operators who fell trees to

People's Daily Graphic

WEDNESDAY, FEBRUARY 14, 1990.



Kojo Lawei (right, front row sitting) and Kofi Badu (bare chested standing), the two culprits arrested working on a dug-out canoe (foreground). In the background is the cocoa farm part of which was destroyed during the felling of the timber. Third from right in political suit is Mr Jehu-Appiah. Picture by E. A. Andam.

Two Arrested For Causing Damage To Farms

From E.A. Andam, Agona Nkum

TWO persons have been placed in custody for illegally felling trees and causing damage to cocoa farms at Agona Nkum in the Agona District of the Central Region.

The two, Kojo Lawei, 34-year old canoe builder and Kofi Badu, 32, a buyer representative were arrested on Friday, February 9 in a police cum-militia clamp down on illegal and indiscriminate felling of economic trees in the area.

The District Secretary for the area, Mr Hopna Kweku Jehu-Appiah, who was personally involved in the operation told the Graphic that the two were arrested in a bush whilst building a canoe from an illegally felled Wawa tree.

He said the operation also resulted in the seizure of two canoes almost completed, two "Odum" logs and a Wawa log, all illegally felled.

He further stated that apart from the ecological imbalance their activities cause, precious cocoa trees are also destroyed.

According to Mr Jehu-Appiah, investigations revealed that the two purchased the trees from one Ebusuapanyin Kwame Easilie at ₵6,000 each without provision being made for compensation to be paid to farmers whose crops might be destroyed in the process of felling or utilising them.

The District Secretary cautioned the people against indiscriminate felling of trees in the area. He said any community or person who desires to fell a tree should apply through the district Forestry Department for approval.

He said the seized logs and canoes will be sold and part of the proceeds will be used to compensate the affected farmers and the rest paid into the District Development Fund.

be used for railway sleepers and lumber.

3:8 Felling the Tree

The chainsaw operator or other members of the team will prepare the ground surrounding the tree and the anticipated space the tree will occupy, once felled. The carvers are responsible for any damage done to crops during the felling of the tree (fig 14). Ritual libation is performed at the base of the tree asking for no harm to come to the carvers and their families as they cut into the tree's spirit. The chainsaw operator will fell the tree near ground level, lessening the bounce when the tree hits the ground. The wood is not seasoned as a felled Wawa tree deteriorates very quickly in the forest climate. The log will only last for a few weeks in good carving condition and for this reason canoe carvers begin work on felled logs immediately. Work thus progresses as quickly as possible in order to complete the canoe and remove it from the forest environment. Prior to the introduction of the chainsaw, trees were felled above the buttress by the construction of a platform at the top of the buttress. Carvers stood on this platform and used axes to complete the felling (fig 15).

The second cut is made to the felled tree to remove the buttress, which is usually about 3m long and then the straight bole begins. The third cut is to remove the crown which allows the log to drop onto the ground (fig 16). Here the Master Carver can inspect the bole at both ends of the log for internal blemishes such as heart rot. If the log is healthy the master will measure, using 'arm spans', the length of the log needed to construct a large canoe. He will then mark the fore and aft limits of



fig. 15

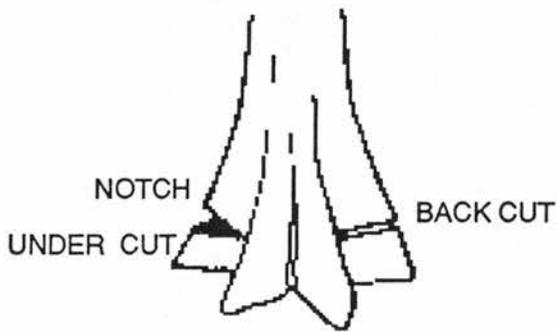
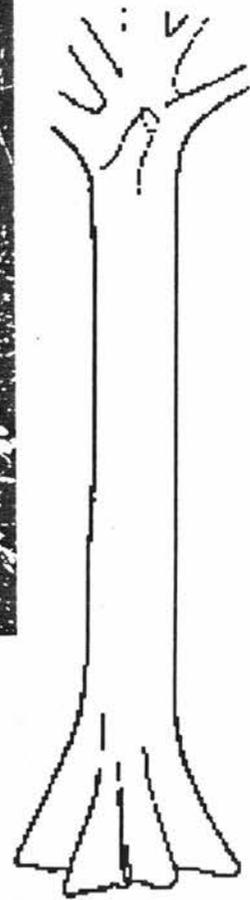
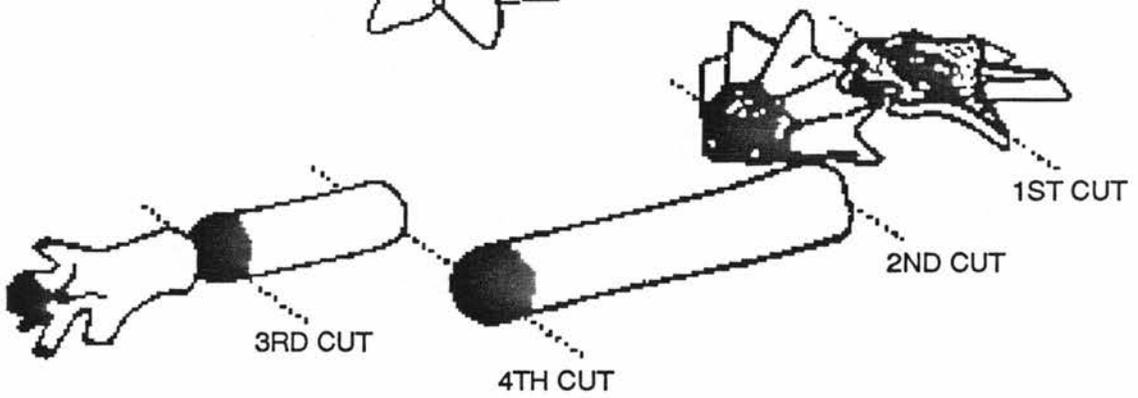


fig. 16



the hull. A finished canoe of 16m, about 9 arm spans, would require a log of roughly 17m or 9 arm spans and 1 arm length.

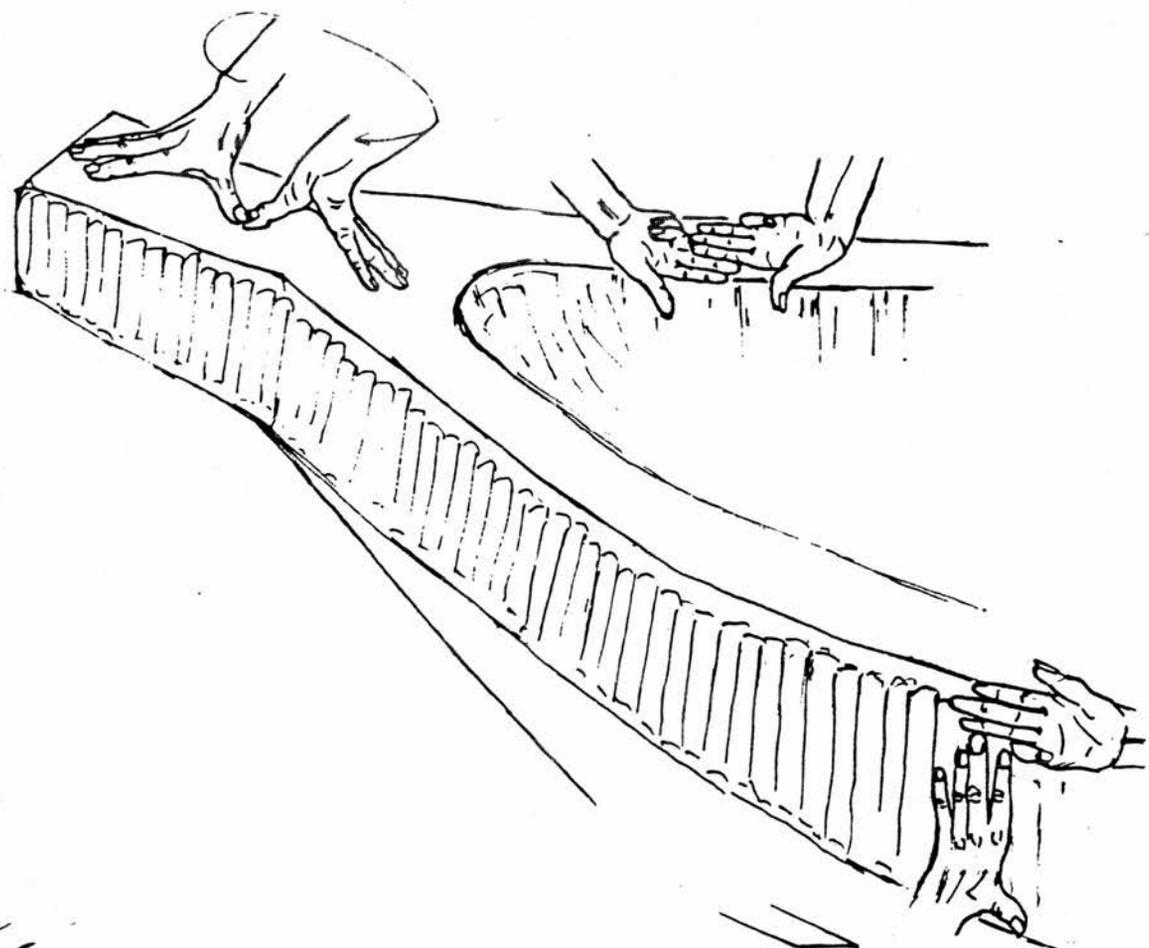
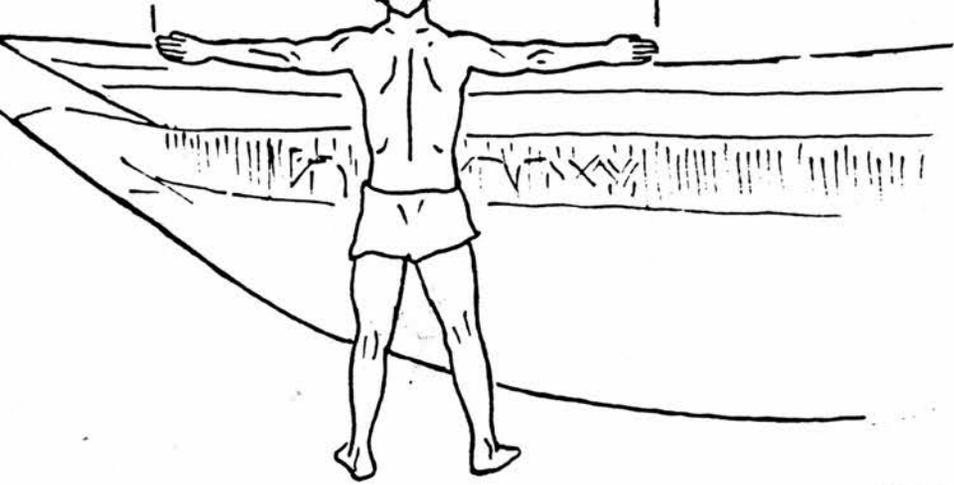
Once felled, checked and approved, the tree is ready for measuring and carving.

3:9 Measuring up the Canoe

No measuring tools or formal units of measurement are used in the construction of the dugout canoes; instead all measurement is performed utilising limbs of the body. Length is measured in 'arm spans', as illustrated in fig. 17, which is the distance between the fingertips of outstretched arms. The length of a canoe would be measured in multiples of arm spans and 'arms lengths' which is half an arm span; this is measured from the centre of the chest to the fingertips of one outstretched arm.

If the area to be measured is less in distance than an arm's length, 'hand spans' are used (fig 18) where the hand is rotated about the thumb. Both hands can be used simultaneously to measure the distance. Surface areas smaller than a hand span in width are measured by using the first three fingers of each hand (fig 19). The backs of the hand are generally laid down on the wood with the palms uppermost and the measurement is taken across all the fingers. A combination of both hand spans and fingers are used to measure a distance greater than one hand span yet smaller than two hand spans (fig 20).

The width and depth of a canoe are measured in one action; this is by walking the feet one in front of the other, internally from one side of the canoe to



the other (fig 21). This is termed the canoe's measurement in 'feet' and is taken below the straight sides of the canoe. The canoe carvers are careful to use the hands, feet and arm spans of men with average size bodies. This is an attempt to standardise the units of measurement. A man with limbs considered by the K.K. carvers to be average, had the equivalent measurements: foot - 25cm, hand span - 20cm, arm span - 180cm.

3:10 Carving the Canoe

The Master Carver marks the log for the chainsaw operator in order to make the fourth cut, by chipping at the bark with a cutlass. This provides the team with a blank log from which the canoe is made. Work then begins directly, as the wood has a softer texture due to the water content and makes for easier working. Given the rapid deterioration of the log once felled, there is only a limited period in which the canoe can remain in the forest.

The Master Carver determines by sight if heart rot is present and by tapping his hand on the log. An indication would be a hollow sound to the wood. The topside of the canoe will be the hollower side of the log, and the cut ends of the log will also indicate the general condition of the wood. If there is no sign of damage to the log, the Master will decide which way the log will lie, taking into account any natural rocker or curve of the tree. The log is then rolled to one side, out of the line of felling and with the chosen topside facing uppermost, thus allowing working space around the log. If the carvers are unable to move the log manually they may hire the use of 'monkey jacks' from the timber industry. Once in position, the



fig. 22

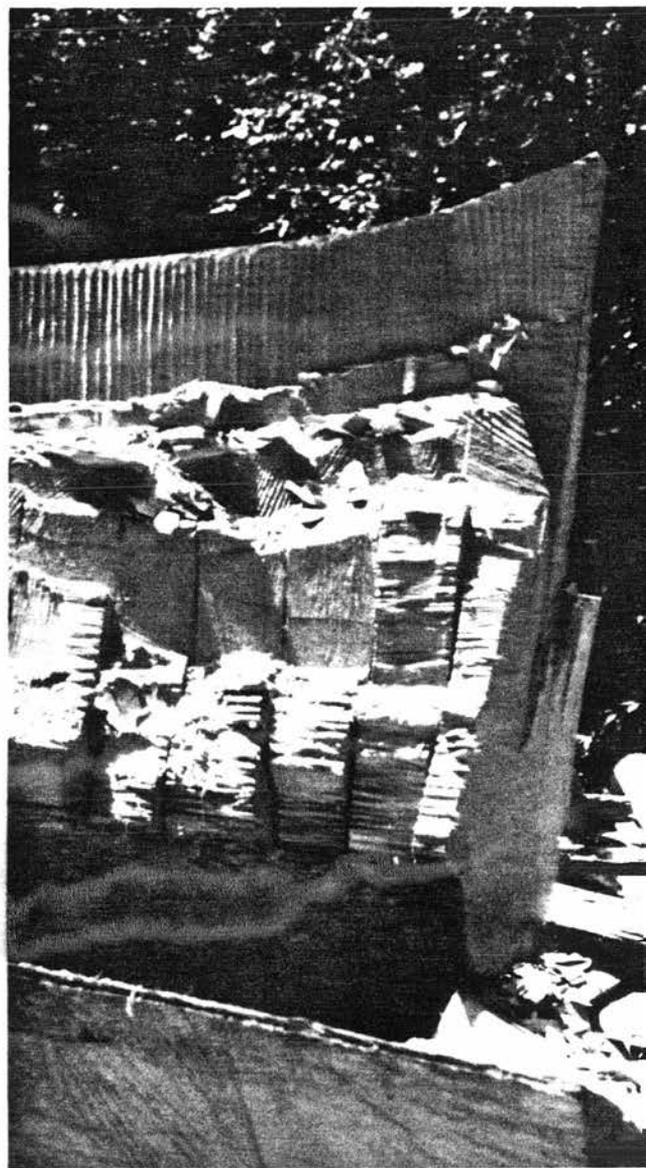
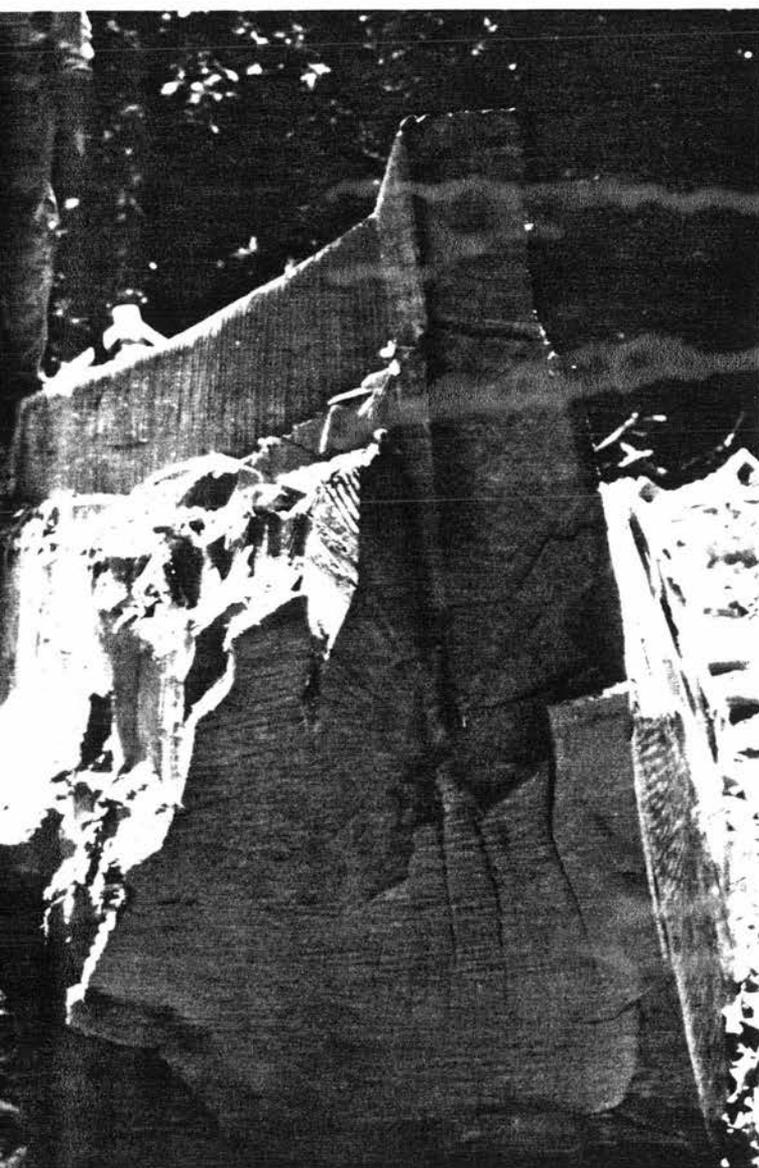


fig. 23

log is chocked up, both to raise the log clear of the forest floor to prevent the onset of decay and to help stabilise the log's movement as work continues.

The first stage in the construction of the canoe is determining the sheerline; the base end of the tree will always become the stern of the canoe, as it is believed to be stronger and best able to take the weight of the outboard motor. The Master will first establish a rough sheerline by walking from the stern of the log, usually marking the starboard side of the log first by chipping a line in the bark with a cutlass. The sheerline rises at each end of the log to the bow and stern. Standing back from the log the Master checks the line by sight and when satisfied with the fall of the sheerline, he will confirm it by chipping the bark using the tatawa adze (fig 22). This enables the chainsaw operator to see the line clearly when he removes the surplus wood above the sheerline. He does this initially by making crosscuts from the upper side of the log to the sheerline. He then slices the waste wood away from the upper side of the log above the sheerline, leaving a relatively flat working surface.

With the upper horizontal for the sheerline defined, work begins on shaping the sides of the canoe, which is straight sided for one hand span and three fingers below the sheerline. The bow and stern are shaped first as they are both fairly symmetrically pointed to a beak. A 16m canoe will begin to reduce in width about 3m before the stern and 4m before the bow. The chainsaw is deployed in removing the waste wood around the stern first. Longitudinal cuts are made from the upper surface

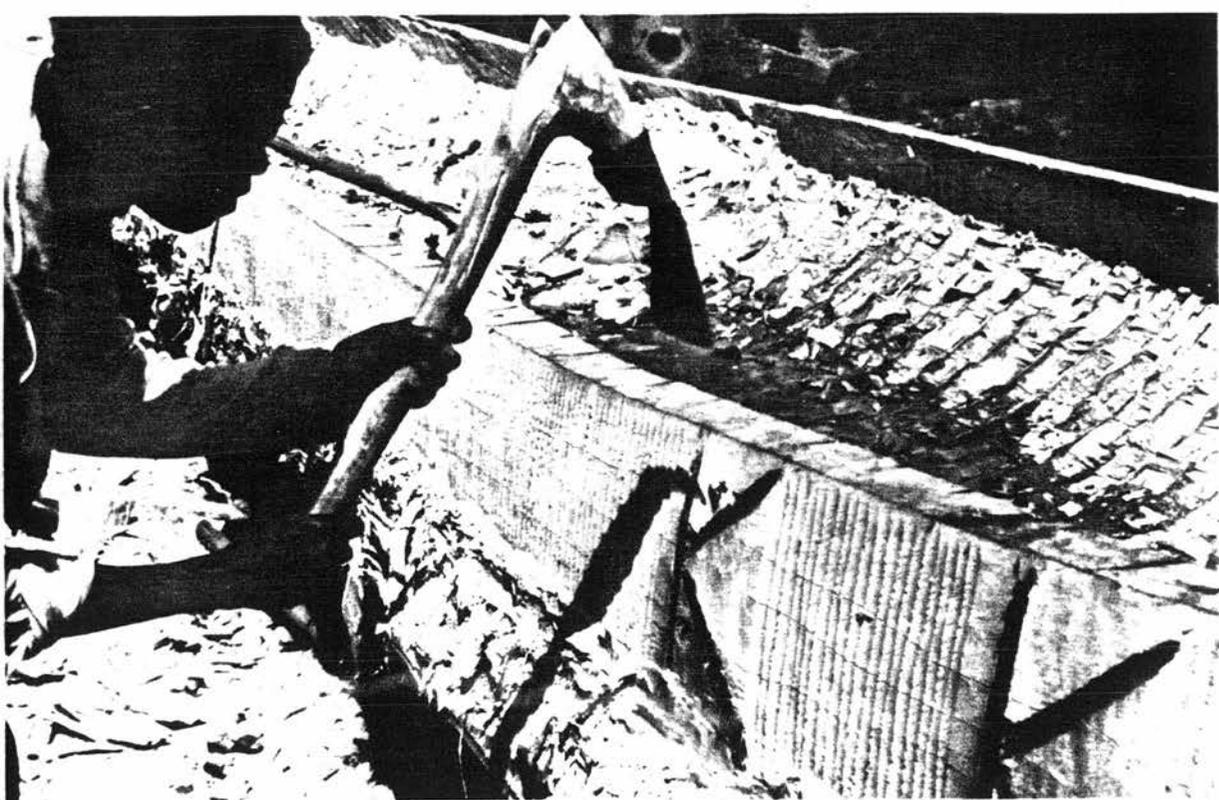


fig. 24



fig. 25

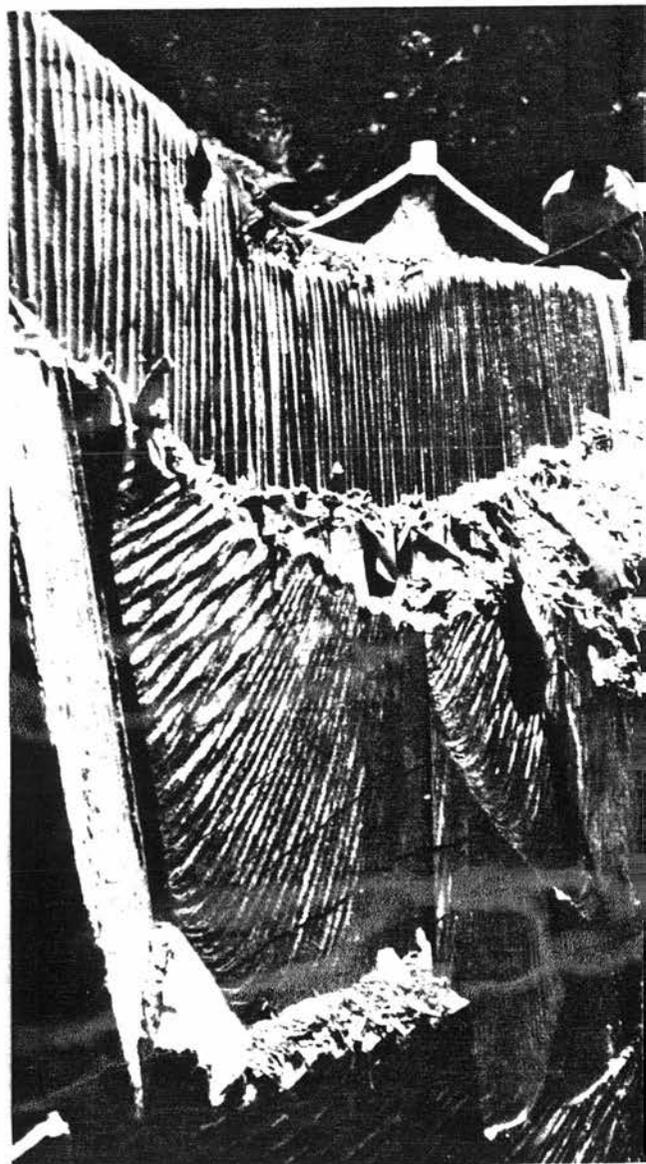


fig. 26

then large slices are cut away from the log at each end on both sides (fig 23). This establishes the pointed stern end of the canoe and the same work is undertaken on the bow.

The mid section of the canoe is straight and the same width is maintained along this section for five arm spans, 9m. Cuts are made with the chainsaw at approximately 15cm intervals cutting through the bark, sap wood and into the heart wood to a depth of about 30cm at the sheerline. The chainsaw operator then stands on the upper surface of the log to trim the wood down both sides of the log, creating straight sides below the sheerline. Although it is the Master Carver who makes all the decisions about the cuts into the log and how the dugout will take shape, all members of the team will work with the hand tools in the hollowing out of the log and shaping of the outside.

On the outside of the canoe below the sheerline, the tatawa adze is used to trim the wood and clean up the rough surface made by the chainsaw (fig 24). A greater level of accuracy is thus achieved to smooth the sides one hand span and three fingers below the sheerline from the stern to the bow. More than one carver may work at this stage, working from both ends. Often both sides are worked on at the same time.

The tee gouge is used to carve the canoe company's insignia, K.K., on both sides, about one arm span from the bow and again one arm span from the stern. The height of each letter is about 25cm. Some charred wood is rubbed into the carved letters to make them more visible. The tee is used to make a pattern along the entire length of port and

starboard sides, from the sheerline down the straight sides to a depth of about one hand span and three fingers. To do this the carver stands above the sheerline and drives the gouge down the sides making a continued series of scalloped cuts (fig 25). This pattern serves both for decoration and makes a more even surface for the carver to sight down in order to check the sides are level and that the canoe's lines have the desired curvature (fig 26).

Once the exterior sheerline and straight sides are completed, work begins on hollowing the interior of the dugout. The use of the chainsaw has speeded up the process of reduction, although the chainsaw has not really altered the method of construction but rather economised on the amount of time taken in man hours to complete the dugout. The chainsaw is used to make a series of cross cuts vertically into the upper surface of the log, at intervals of 15 to 20cm (fig 27). The cuts are made by the chainsaw operator along the length of the log in order to define the area of wood later to be removed by adze. A remarkable level of accuracy is achieved by the chainsaw operator's knowledge of the depth he can go into the log. Members of the K.K. believed that mistakes are rarely made during the hollowing out process. The operator then cuts along the upper surface inside the sheerline to define the dugout's walls which are five fingers (8cm) wide. The walls fall straight sided for a depth of one hand span and three fingers. The chainsaw operator gauges the depth the sawblade can go and maintains parallel sides. Several longitudinal cuts are made with the chainsaw through the cross cuts to make the removal of the wood from inside the canoe easier.

fig. 27

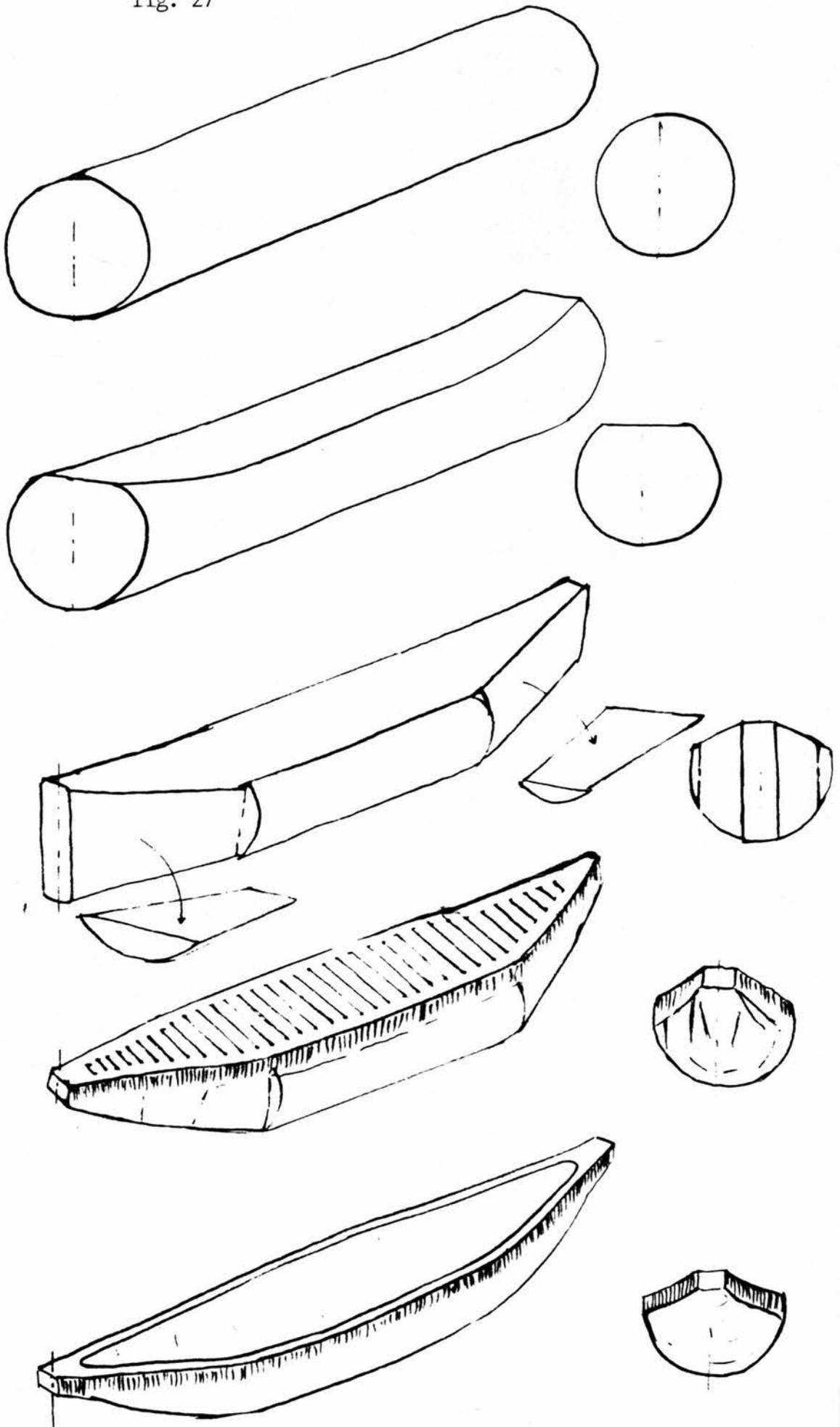




fig. 28



fig. 30



The heaviest of the three adzes, the sankuma, is used to dig out the wood (fig 28). This process can be quite rapid with two or three carvers each working with a sankuma adze. Either the carvers toss away the chunks of heart wood removed by each strike of the adze or the apprentices clear the waste wood. The carvers work by removing the wood in even layers (fig 29) throughout the dugout's length. The smaller ome adze is applied to removing wood from inside the bow and stern sections for about one arm's length (90cm) from the bow and stern (fig 30). The ome has a smaller curved cutting surface of 7cm and is better suited to creating the curved interior.

Wood on the outside of the dugout is stalled until the inside takes shape as the inside form dictates the exterior shape of the canoe. Bark is left on the underside of the log until the final stages in construction; this affords better protection to the heart wood from decay and the wood boring insects that inhabit the forest floor. The removal of the first layer from the interior to a depth of about 40cm takes between one and two weeks, given ideal conditions (fig 31).

A second series of accurate cross cut incisions are made into the half hollowed dugout (this process is sometimes done in three stages). This time the chainsaw will score down to what will become the canoe's bottom, allowing for the canoe's sides to curve. The process of removing the rough cut heart wood with the sankuma adze is repeated. With the bulk of the interior wood removed, the Master Carver, along with the more experienced members of the team, begin to shave the interior with the broad tatawa adze. The ome is used to smooth the

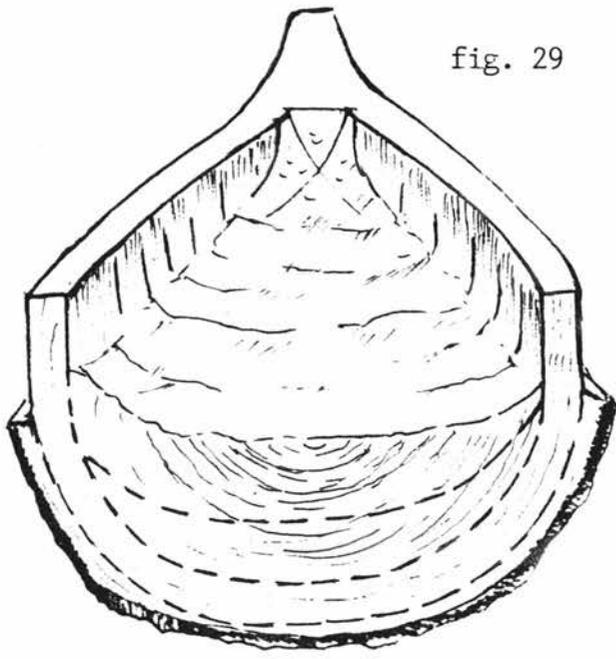


fig. 29

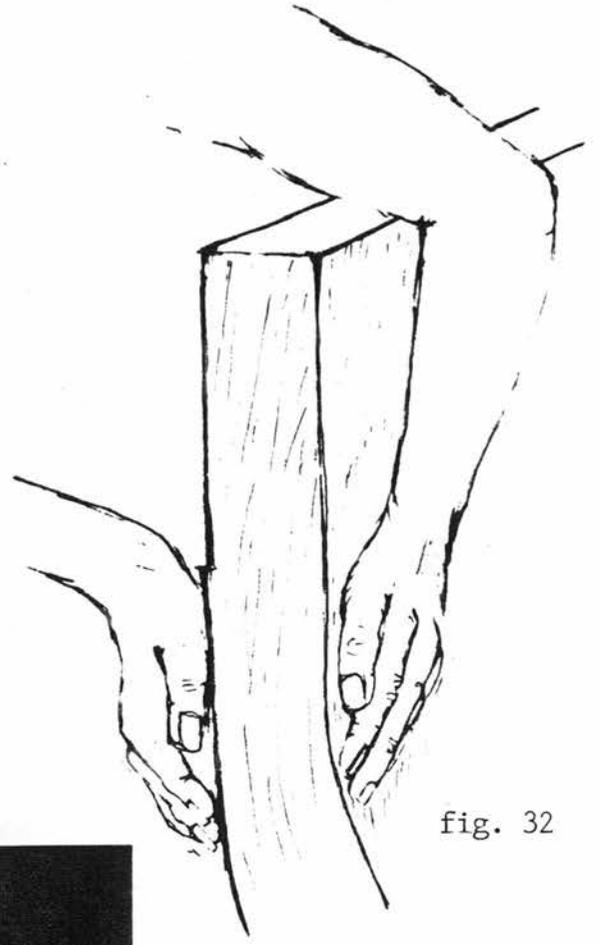


fig. 32



fig. 31

inside face of the bow and stern; the two most proficient carvers work from opposite ends moving backwards to the mid section of the dugout. Here the carvers measure in order to check that the canoe will meet the client's requirements. For a canoe nine armspans (approximately 16m in length) the interior arc must be eight feet (fig 21). This measurement gives the canoe with an external beam of about 180cm.

When the interior is hollowed out and finished to a fairly smooth surface, work progresses to the exterior of the dugout. A monkey jack is hired from the timber merchants or forestry workers (a monkey jack is a simple ratchet jack in common use with the timber industry to move logs). The canoe is rolled onto its side and chocked up to stabilise it while work begins on shaping the stern. Again the chainsaw is used to trim unwanted wood in large chunks from the underside of the stern and stem posts forming the beak at both ends of the canoe. While the experienced carvers shave the ends of the underside of the dugout with the tatawa adze, apprentices strip the bark from the mid section of the canoe. Extra thickness is allowed for on the under or keelside of the canoe to help reduce the damage done to the canoe as it is dragged from the forest. As the carvers work at shaving the exterior of the hull, thickness is gauged by placing the palm of one hand inside the canoe wall, whilst reaching down the outside of the canoe to feel for the thickness between the two palms (fig 32). No holes are drilled as the carver intuitively knows the thickness of the wood between his hands. The K.K. team of carvers do not use any measuring tools, although Coakley's report on canoe construction states, "In cutting for bottom

thickness a guide is found by placing a straight piece of wood transversely from sheer to sheer and by using a measuring stick, subtracting a handspan from the known depth of the hull. The inside bottom line is therefore dependent on the sheerline. The forefoot and aft sections are then cut to follow the sheerline by height". 15

The angular tumble-home becomes a squared up improvement on the natural curvature of the log. The canoe has a fairly flat keel section, although if the log had natural curvature the carvers will try to build a canoe with as much rocker as possible. Smaller canoes are easier to carve with rocker but the large canoes tend to have a very flat mid section due to the maximum width of the log over such a length.

With one side shaped and finished the log is rolled over, either with the monkey jack or manually, if the log is now lightened sufficiently. This allows work on the opposite side to start in order to complete the dugout. The walls of the dugout from the sheer down the straight sides for one hand span and three fingers, have a thickness of five fingers which averages out to be 9cm along the entire length of the canoe sides. The underside of the hull is finished to a thickness of approximately 20cm and the tumble-home has a wall thickness of 12cm. These are average measurements given to me by the K.K. Company. The carvers try to maintain these measurements on the construction of large 15cm plus dugout canoes.

Given ideal weather and working conditions the process of felling, hollowing and shaping the dugout canoe can take as little as two weeks

continuous work for a team of five carvers. They work at the site of the dugout eight hours per day, six days a week. Heavy rain, chainsaw breakdown, availability of fuel for the chainsaw, financial constraints and social commitments are all factors which affect the work in progress of a dugout. The major limitation on progress is the lengthy search made to locate suitable Wawa. The operations take place deep in the forest away from roads. The carvers have to travel long distances to and from the work site, expending productive energy and time walking. Throughout much of the forest region electricity facilities are not available, thus making mechanisation of the process impossible. All these factors mean that a large canoe can be under construction for up to six weeks or more before it is ready to be paid for and transported out of the forest.

3:11 Payment for the Dugout

Once the dugout is finished a message will be communicated to the client to come and inspect and dugout at the work site. The client now pays the balance due on the full payment before the dugout is removed from the forest. A dugout which had recently been completed by the K.K. Company, measuring 15.5m, was waiting to be collected; it cost a total of c950,000. Prices range between c700,000 and c1,000,000 for a large dugout in perfect condition; that is a dugout with no splits or defects in the wood and one which has been accurately shaped by a team of experienced carvers. The selling price of various sizes of canoes differs considerably since there is no systematic basis for costing. The carvers base their quotations on the economic climate within Ghana

and include general price fluctuations and difficulties encountered in the acquisition of timber and other inputs involved in the construction process of the canoes.

Dugouts are often completed with a hole in the bow where heart rot had been present in the log. Heart rot is not always detected until the canoe is nearing completion at the hollowing out stage and the Master Carver uses his discretion whether to continue with construction. Such canoes are sold at a reduced price and will be repaired on arrival at the coast.

When the client has settled on a price to pay for the finished canoe, he will pay the amount due. The canoe is then no longer the responsibility of the carvers, should any accidental damage occur to the canoe.

3:12 Transporting the Dugout to the Coast

The carvers in the forest are often in a better position to help organise the first stage of the long journey which the canoe must undergo in order to get to the sea. Before the advent of road transportation in Ghana the canoe used to make the remarkable journey to the coast through river systems¹⁷ and in later years the canoes were transported from forest to coast by train. The carvers therefore obviously preferred to work close to rail lines which ran through forest areas. Prior to the introduction of tractors to the forest by timber merchants, canoes were manually raised onto rolling logs and twenty or more men would drag the canoe to the rail or road side. (The Master of the K.K. Company explained to me that the men sang



fig. 33

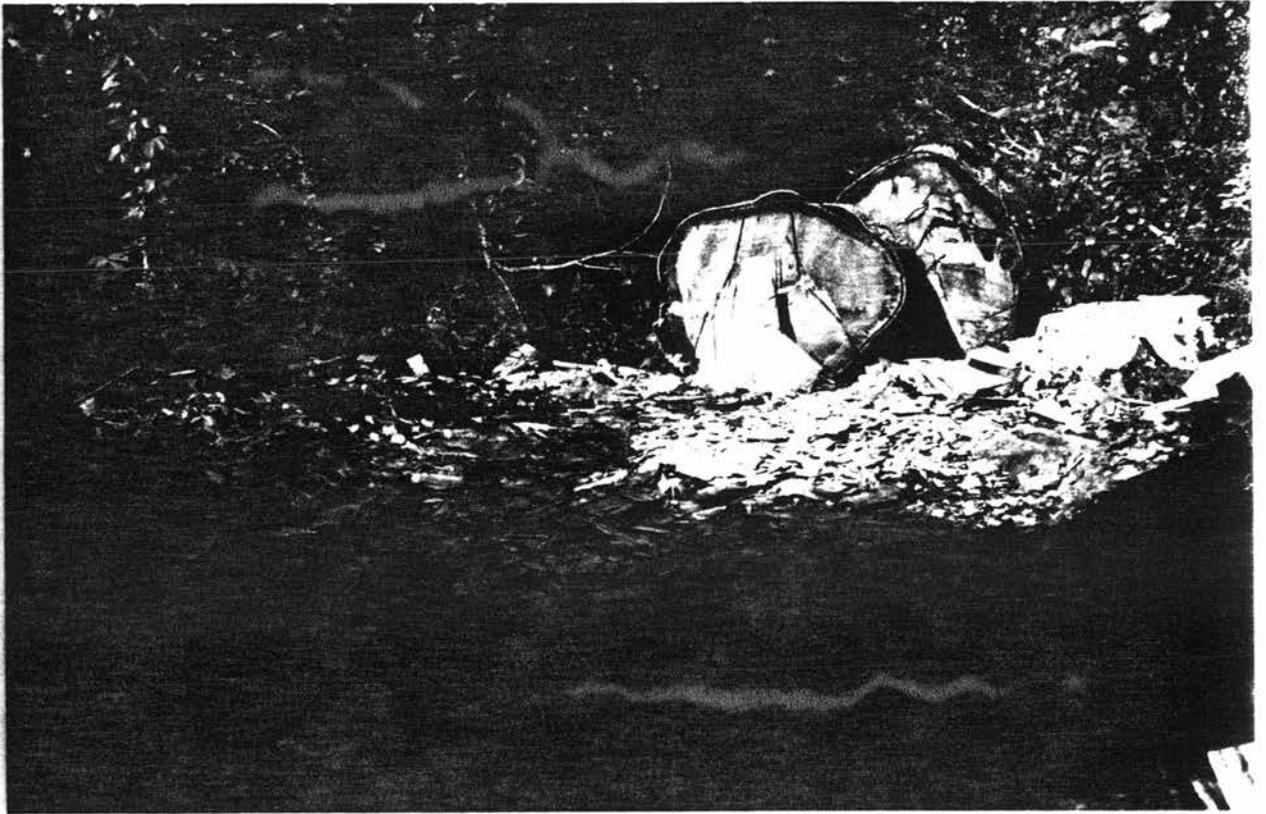


fig. 34

in rhythm as they pulled the canoe; he was involved in this process until the 1950's). Today a tractor from a timber merchant operating in nearby reserves is hired to do the task. For the fee of c70,000 the tractor will tow the canoe from the work site in the forest and position it at a suitable pick-up point for a lorry to continue the second stage of the journey.

The carvers clear a pathway to enable the tractor to come from the road side into the forest to the site where the canoe has been constructed. A rope or chain about 3 or 4 arm spans in length is attached to the tractor section of the canoe about 1 arm's length from the stem post (fig 33). No member of the canoe carving team will follow the canoe out of the forest. Only the tractor driver and his assistant will drag the canoe through the forest.

There is no warranty placed on the safety of the canoe as it is moved to the road side. Occasionally the bow section is ripped out of the canoe, but when this happens the canoe is swivelled around and pulled out of the forest stern first. The damage is then repaired at the coast.

After the completed canoe is removed from the forest, the carvers take the tool heads off the stocks and these stocks are then discarded after each canoe is finished. The K.K. team believe the stocks to be 'worn out' and traditionally they have always used new stocks for their tools when they undertake the construction of a new canoe. As Wawa has very poor burning properties, there is little use for the discarded tree and wood chips created during the hollowing process. The work site is

therefore left (fig 34) to become overgrown and the wood rotten as the carvers move on to the next tree and begin the whole process of constructing a dugout canoe again.

The canoe is now fully the responsibility of its owner who will organise for a lorry to pick the canoe up from the road side (fig 35) and transport it by road to the fishing community from which it will operate. This stage of the transportation costs between c100,000 and c200,000. The owner will also arrange for a group of strong men to accompany the lorry in order to load the canoe in the forest and unload it at the coast. The owner will provide the food for the men who help with the removal of the canoe. ²

Inflation of the fuel costs has meant a considerable increase in the costs involved in the transportation of the canoes. Canoes now spend a longer time at the road side in the forest areas waiting to be collected while the owner finds the funds to pay transportation costs. Certain haulage companies do offer their services for canoe transportation, although the majority of lorries will have delivered goods further up country and on return journeys will carry canoes out of the forest. During the rainy seasons many of the roads into forest areas become impassable as they are unmetalled dirt roads. The distance from the forest to the fishing communities varies from 200 to 400 kilometres. The expenditure involved in transportation of canoes has been a burden to both carvers and purchasers. Completed dugout canoes may lie at the construction site for months which is regrettable due to the deterioration of cut wood in the forest climate. It is in the interest of

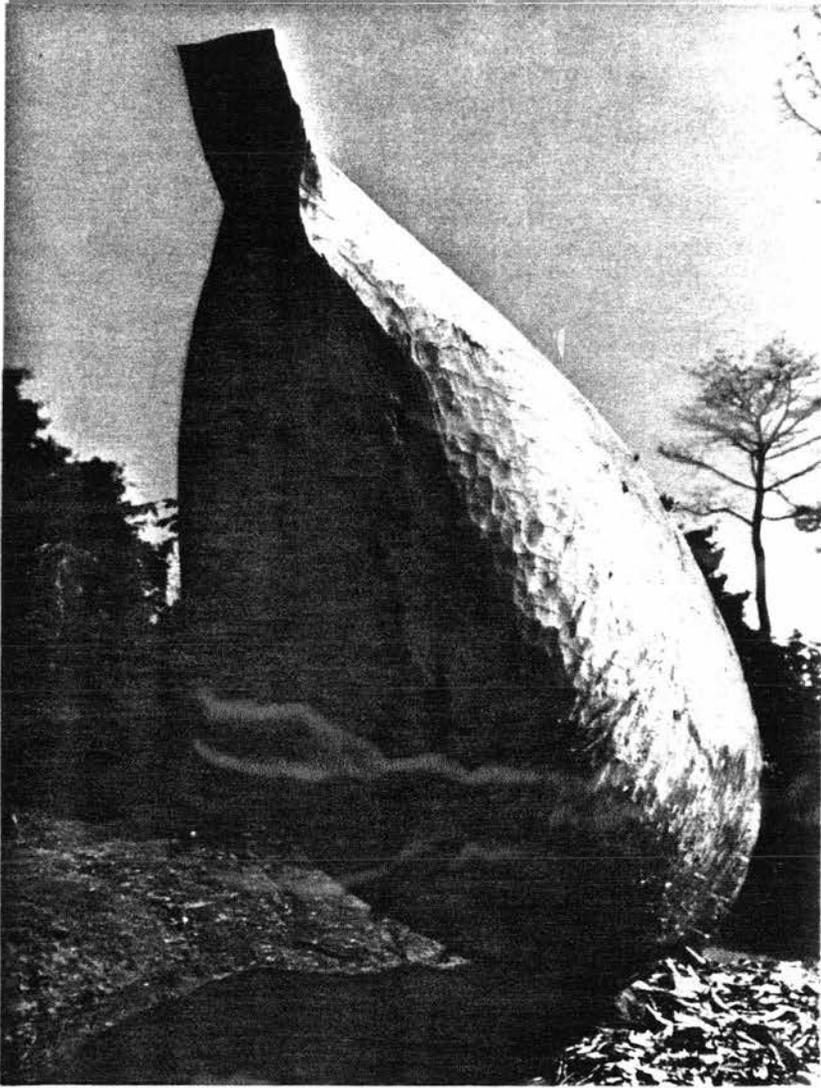
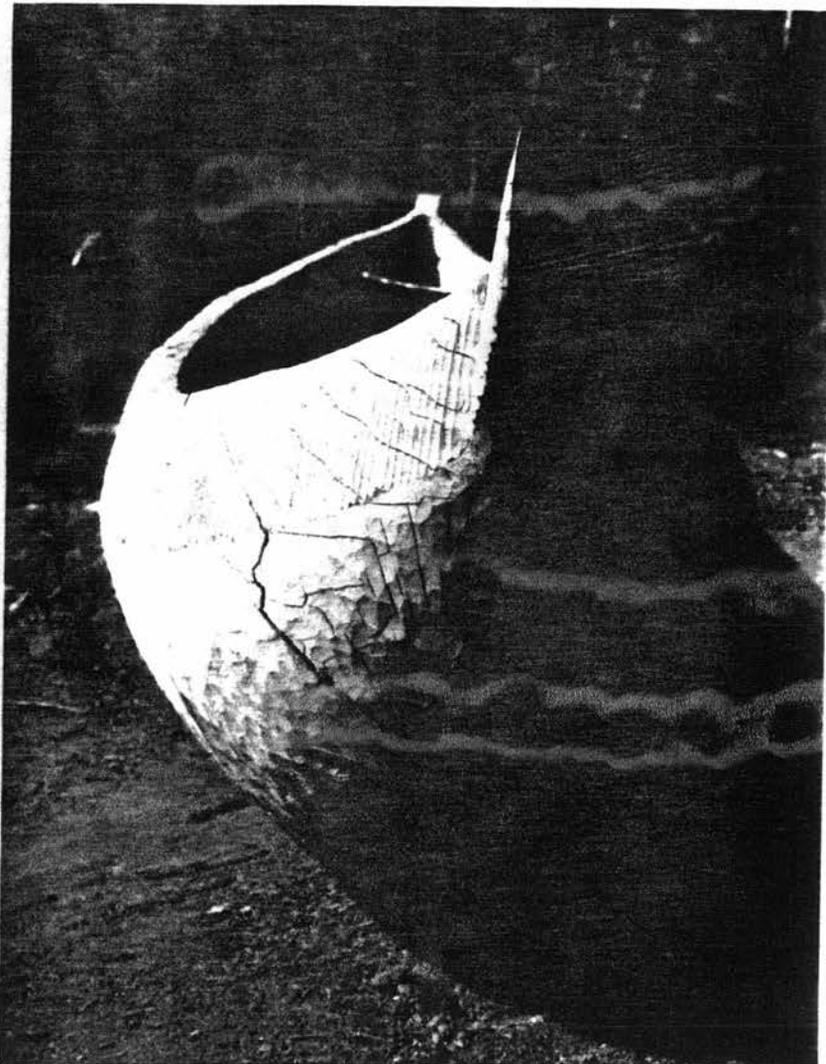


fig. 35



the canoe owner to have it removed from the forest but the lack of tractors means that the tractor owners are thus able to charge exorbitantly for their services.

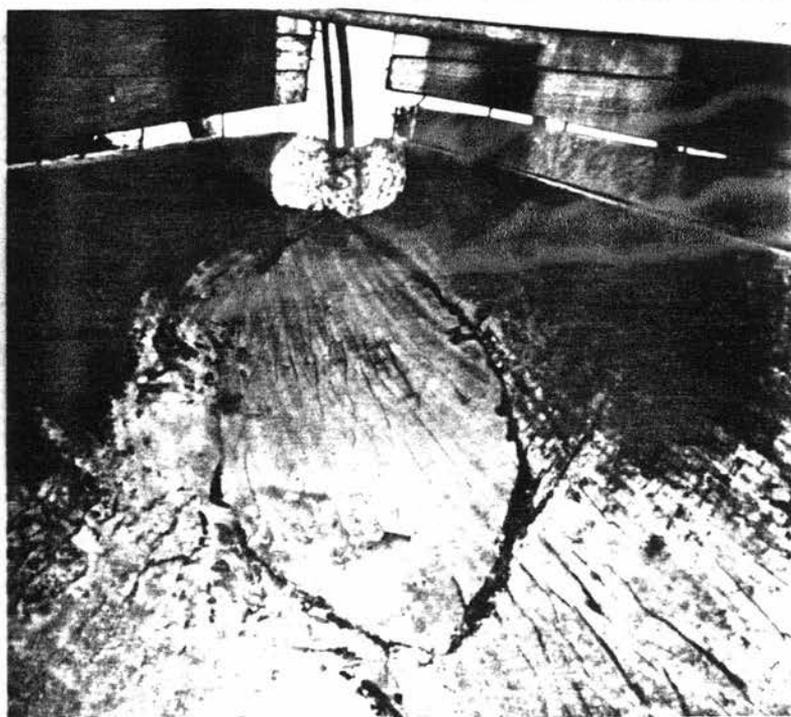
fig. 36



fig. 37



fig. 38



CHAPTER 4

THE COASTAL PHASE

4:1 The Carpenters

The canoe is delivered at the landing beach from which it will operate (fig 36). Fishermen say a period of drying out is desirable for the canoe before work commences on the 'rigging' which is the local term for planking up and fitting out ready for fishing. At the beach the owner will arrange for a team of carpenters to complete his canoe. The carpenters are skilled craftsmen who make their living amongst the fishermen finishing and repairing the canoes; many are related to fishermen and live in the fishing communities although they are not usually fishermen themselves. They are thus another group dependent on the artisanal fishing sector for their livelihood. The team of carpenters consist of a master who is the most experienced carpenter, an experienced assistant and possibly one or two young apprentices. The carpenter's expertise is more akin to cabinet making than canoe building.

4:2 Tools and Processes

The master carpenter initially assesses any damage which the canoe may have incurred on its journey from the forest to the coast. This journey is fraught with danger as splits may develop during road haulage and accidents occur during the unloading of the canoe from the lorry to the beach (fig 37). When the canoe arrives with a hole in the bow or stern due to incipient heart rot, the carpenters will acquire an abandoned canoe whose

bow or stern is in good condition. The corresponding area to the damaged area is cut out of the abandoned canoe by handsaw. The replacement part is positioned over the damaged area and chalk or charcoal is used to mark around the patch on the new canoe and used as a template in order to cut the same area out around the damage. The new patch is positioned and the gap caulked (fig 38) with a variety of materials ¹ including:

- 1) Cork is mashed with petrol then pushed into the gap, allowed to dry in the sun and painted over with an oil based paint.
- 2) Cloth rags are dipped in molten tar before being poked into the gaps. An early method of caulking which is still in use is kapok mixed with palm oil packed into the cracks. ²
- 3) Nylon sacking is presently favoured as a caulking material; the sack is cut into thin strips, pushed into the gap with a little petrol poured over the nylon which is set alight. Once the nylon has melted the fire is put out with water.

Once the patch is in position and the gap caulked, locally manufactured iron staples measuring between 15 to 30 cm in width are hammered into the patch and the hull across the caulked gap to secure the patch. Blue staining often occurs where the iron is in contact with the wood.

Once the hull of the canoe is repaired, work can begin on the second stage of fitting out. The carpenters use basic wood working tools (fig 39); with the exception of small chainsaws only hand



fig. 39

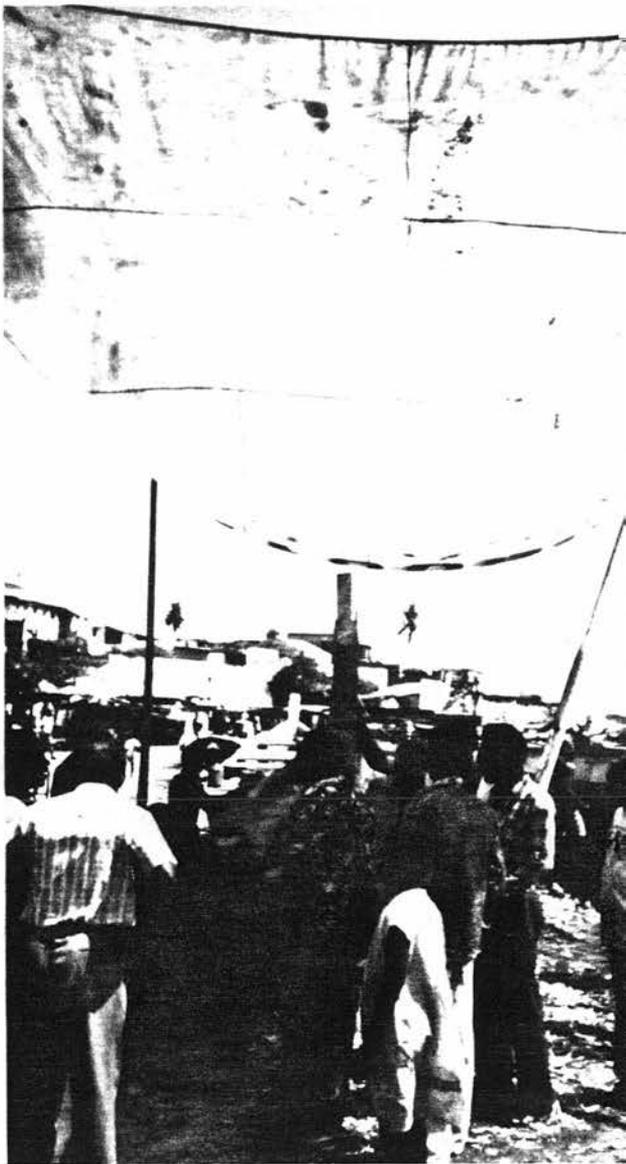


fig. 40

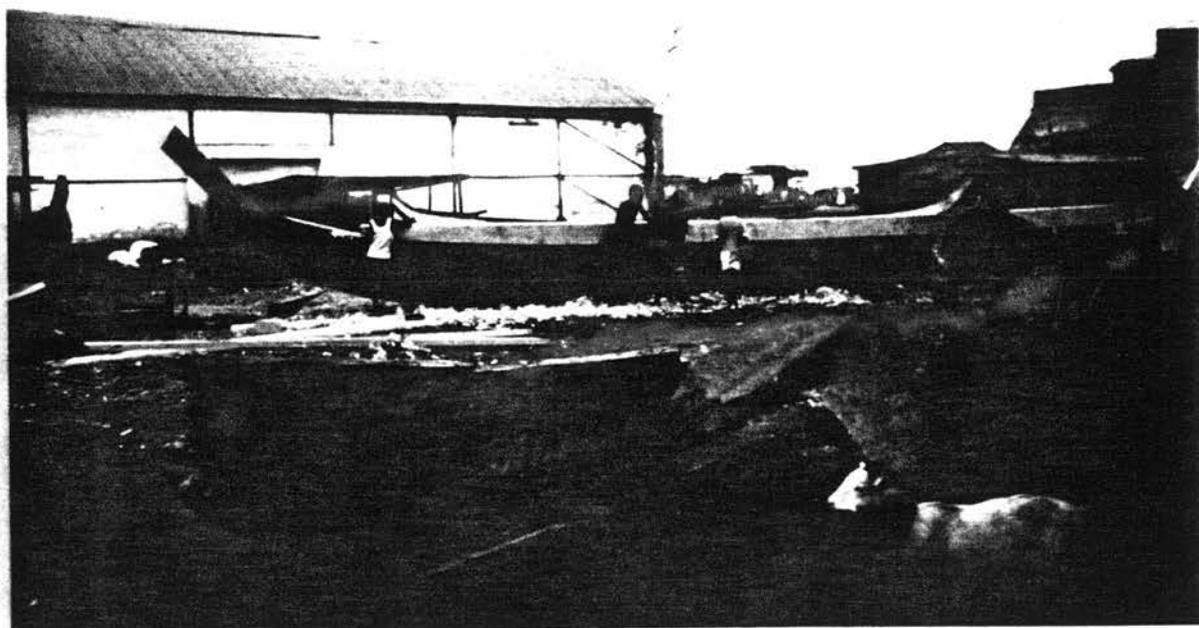


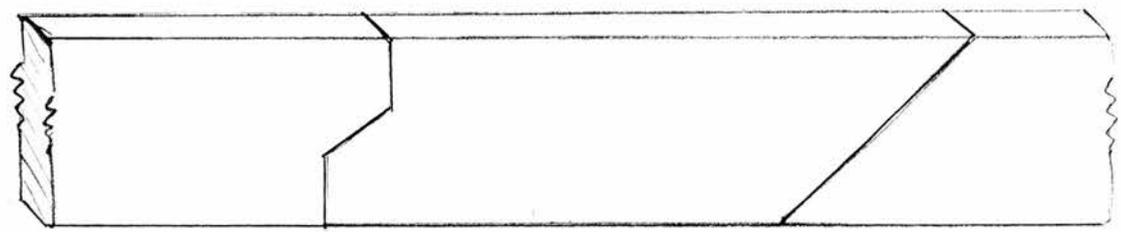
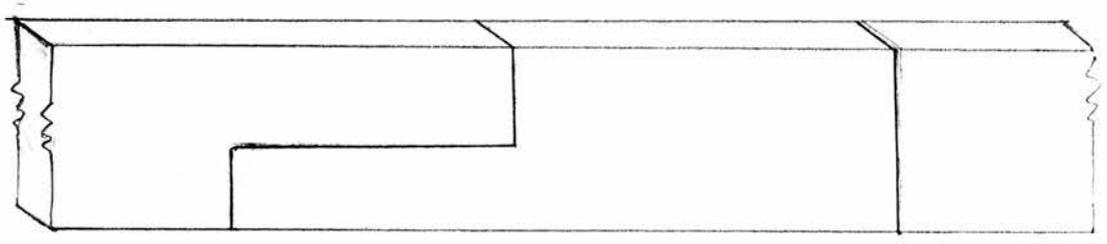
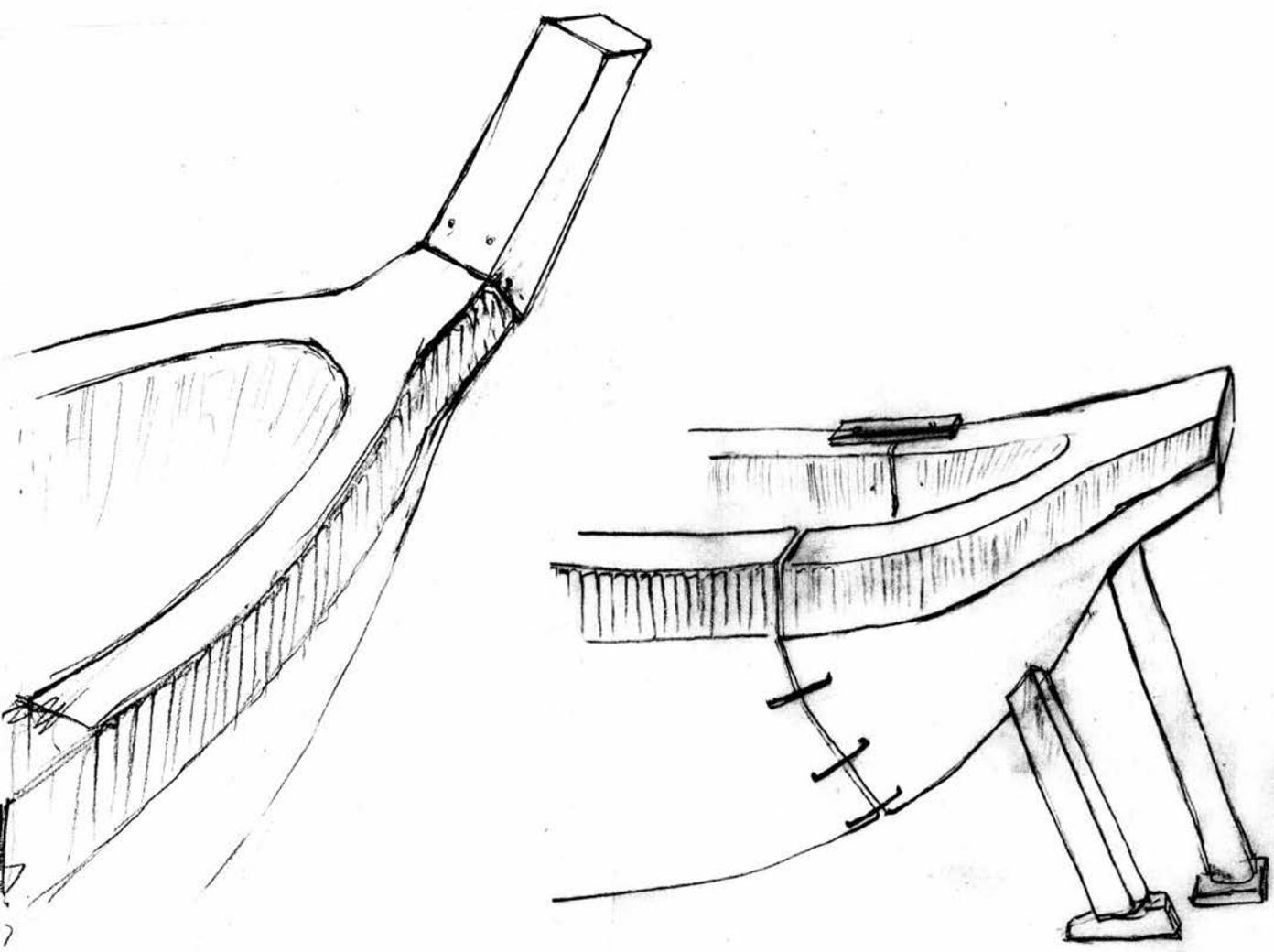
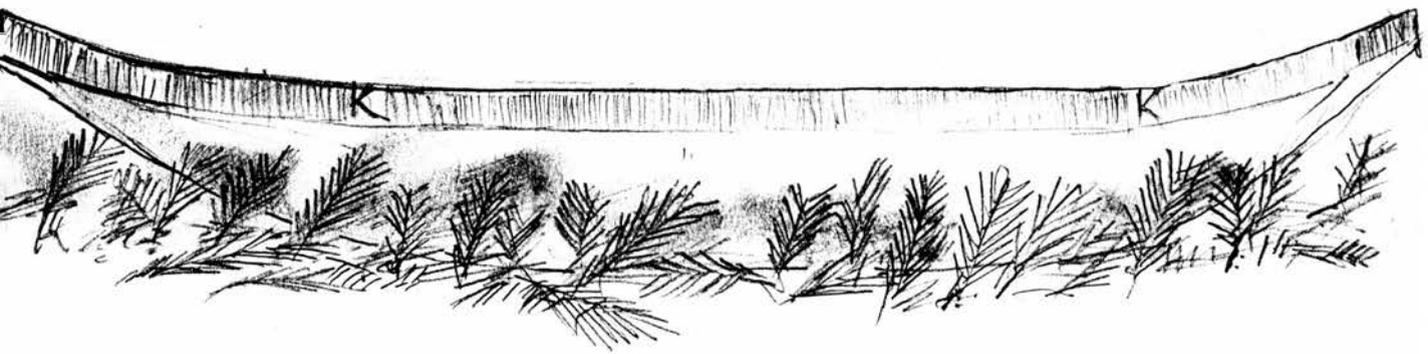
fig. 42

tools are used to finish the canoe. The tools include: the tatawa and ome adze, hand saws, chisels, hammers, hand drills, try planes and crowbars. The team of carpenters work on the exterior of the canoe first. Initially the canoe is turned over to show the underside facing uppermost. The canoe is now light enough to man handle and chock up on blocks of wood or pipe. The underside of the canoe always needs finishing to smooth the damage done when it was dragged through the forest. The more experienced members of the team use the tatawa and ome adze to trim and clean the hull's exterior. A varying amount of work is needed to dress the sides (depending on the quality of the dugout canoe). When the exterior of the work is finished it is turned upright; there are always plenty of willing helpers or crew members to manoeuvre the new canoes. A sun shade may be erected to protect the canoe and carpenters from the fierce sun; a sail is often used for this purpose, as shown in fig 40.

Work begins on the inside of the dugout canoe, again using the tatawa and ome adze to smooth the tool marks left by the forest carvers. Attention is given to the sections of the canoe where fishing nets will be stored.

4:3 Charring the Canoe

The dugout canoe is now ready to be charred (fig 41). The charring process is widely believed to lighten the wood by evaporating the water content in the wood, but the primary reason for charring the canoe is to drive out the insects which inhabited the wood in the forest.



The canoe is raised onto metal or concrete pipes; material which will not catch fire. Wet sand is placed protectively over any caulking or repairs on the canoe. Spear grass, shrubs or palm leaves are used in the charring which is usually carried out in the late afternoon when there is a steady breeze; the fire is lit against the wind so that it burns gradually and care is taken not to set fire to the canoe, altering the thickness of the hull. Sticks and wet palm leaves are used to beat and control the fire and when the canoe is evenly charred the fire is doused with buckets of water. Some carpenters turn the canoe upside down and place a line of palm leaves along each of the canoe's sides in order to char the inside of the canoe. There is a difference of opinion amongst the fishermen about charring the inside of the canoe; some believe that the smoked wood ash acts to weaken the thread of the nets when the canoe is in later use. ⁴

4:4 Planking up the Canoe

Either the canoe owner or the carpenters pay for the locally procured raw materials used in the second phase of construction. More flexible systems of credit are available between the timber supplier, carpenters and canoe owner due to the close proximity of those involved in the second phase of construction. Wawa is used for the planking up of the canoes because of availability and relatively inexpensive cost.

The first stage of the construction is to extend the stem and stern posts. The posts are cut from large pieces of timber which are at least 20 cm in depth. No measurement is used when cutting out the

posts; the carpenters instinctively know the shape to cut out with a small chainsaw when forming the posts. The stem post is always longer than the stern as the bow is planked up to a greater height than the stern. The stem post is fitted to the beak which was formed on the dugout by the forest carvers; a hand saw is then used to trim the beak giving a flat surface for the stem post to be nailed onto with large 15 cm steel nails. The two surfaces which touch are often tarred and iron staples are sometimes used to secure stem post to the bow of the dugout. There are regional variations in the length of the stem post; it tends to be a fashion in newer canoes in James Town to have long stem and stern posts approximately 1 m in length. These post extensions can be seen on a charred canoe in fig 42.

With stem and stern posts in position, planking up begins. The mid section of the canoe is usually completed first with long straight planks. The canoe owner has more control over the second phase of the canoe construction as he is able to visit the canoe at more regular intervals to check on progress; he may even join in with the construction or have members of his crew helping the carpenters. The canoe owner will orally pass on his requirements, taking into account the type of fishing he intends to do and any design features he wants incorporating into the second phase.

In extending the canoe, the carpenters will either purchase ready cut planks or large chunks of wood which the member of the team who is skilled with a chainsaw will cut up into planks of the desired size.

fig. 43

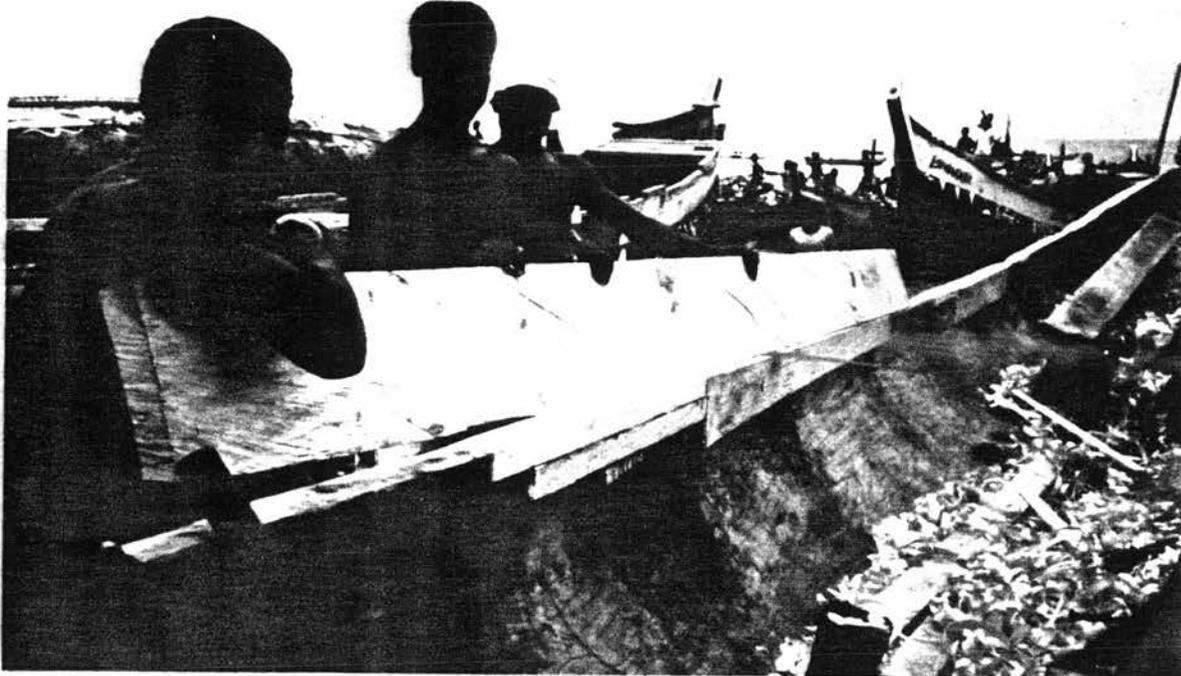


fig. 44

The carpenters prefer the first strake to be the deepest planks using as few in number as possible on each size. The planking starts where the sheerline from the stern levels off to a horizontal flat portion in the mid section of the canoe. The planks are approximately 30 cm in depth, 5 cm plus wide and 2.5 to 3 m in length. The plank is laid edge to edge with the sheerline of the canoe, the master carpenter then trims the two edges to create a good fit. Obvious protruding areas on the sheer are planed down with a try plane. The apprentices will hold the plank in position while the master runs the saw between the two surfaces (fig 43) to achieve a good fit (when light cannot be seen in the crack). The plank is either set to continue the straight sides of the dugout or set to expand the canoe at the gunwales. This depends on the type of beach the canoe will operate from and varies between different teams of carpenters as to how they plank up the sides. The carpenters, however, stressed that the planking should not expand the width inside the canoe more than about 40 cm in difference between the dugout and the planked up gunwale, for if the canoe is expanded too much it will affect the stability. This was explained to me by several teams of carpenters in James Town and Labadi.⁵ The angle of the plank can be seen in fig 44.

The planks are joined to the dugout by nailing into the inside of the plank through the two surfaces into the dugout's gunwale; large 15 cm steel nails are hammered in every 20 cm. With the first plank in position the next plank is joined end to end. Various wood joining cuts are used to key in the planks which are illustrated in fig 45. A hand or chainshaw is used to cut between the two surfaces

to be joined. This process of planking up the first strake is continued along the level mid section of both sides of the canoe. The line of planking is then continued towards the raised bow and stern. Large planks of the same size may be continued right up to the posts either in one length of plank from those already attached or smaller cut pieces of planking is used to form the curved line of planking towards the pointed stern and bow of the canoe. If a single plank is to be used the carpenters trim the plank with the saw and try plane to the required shape, the end which is flush with the strake already in position is fitted and nailed onto the dugout, and the plank is manually flexed as it is nailed to follow the curvature of the dugout. Some carpenters put saw drifts into the inside surface of the plank to help the plank to bend. On a large ali poli canoe as few as four planks can be used to run the whole length of the canoe, or many smaller planks can be keyed into each other to produce the first strake. The planks are attached to the stem and stern posts with a flush angle cut on the plank so that it can be nailed onto the side of the post.

The height of planking on new canoes under construction appears to have increased over the last ten years to accommodate an increase in netting volume and the increased number of crew. There are also regional variations in the height of planking added to the dugout, from 30 to 60 cm (this measurement is taken mid canoe).⁶

A second layer of planking is usually added to which the thwarts and hardwood rubbing strake is attached. The second line of planks are edge joined to the first line of planking and nailed



fig. 46

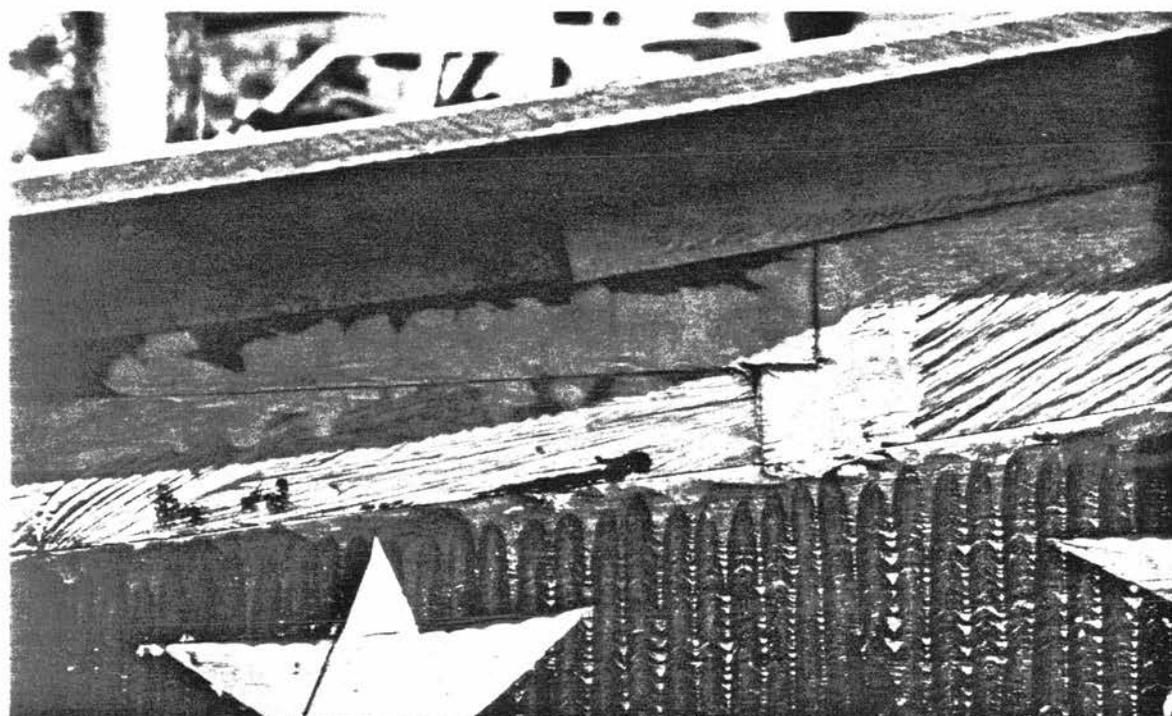


fig. 47

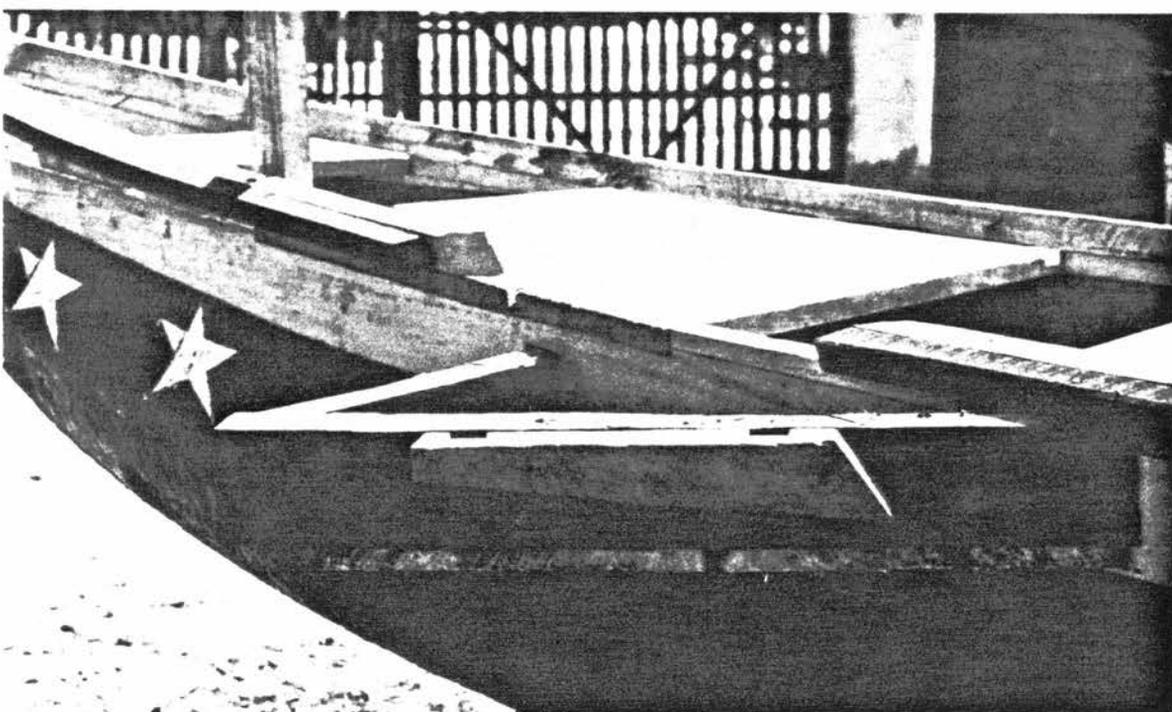


fig. 49

through from the upper line of planks. Lighter pieces of timber are used on most canoes which are planked up to approximately 40 cm. Canoes planked up in excess of 60 cm utilise two lines of hefty planks. An exaggerated raised bow is formed on the dugout and the stern is similarly raised (fig 46), but not to the same extent as the bow. As the function of the bow is to fend off waves, the emphasis is not on the strength of the structure, which is possibly why the planked up bow section often has the appearance of a jigsaw of smaller pieces of wood keyed in to fill the area (fig 47) which rises to the stem post; these pieces are nailed with 8 or 10 cm steel nails.

4:5 Fitting Out

The thwarts are cut from Wawa planks to span the gunwales⁷; the interval spacing of the thwarts (which act as seating for the crew members) depends on where the nets are to be stored. The thwarts are either equally spaced along the entire length of the canoe or positioned to allow greater storage and working space. More than one piece of wood will be laid across the gunwales to make a seat of the desired width, which again varies between canoes. The thwarts are nailed onto the top edge of the planking with 6 to 8 cm steel nails. The thwart or seat nearest to the bow of the canoe is broader than the other seats, in order to fit the board which has a rectangular slot cut out in the middle to hold the mast and one of the spars when the canoe is rigged for sail.

The gaps along the gunwale between the planking are filled in with either Wawa or a harder wood such as Odum, Danta, Mahogany or Mangrove. A rubbing

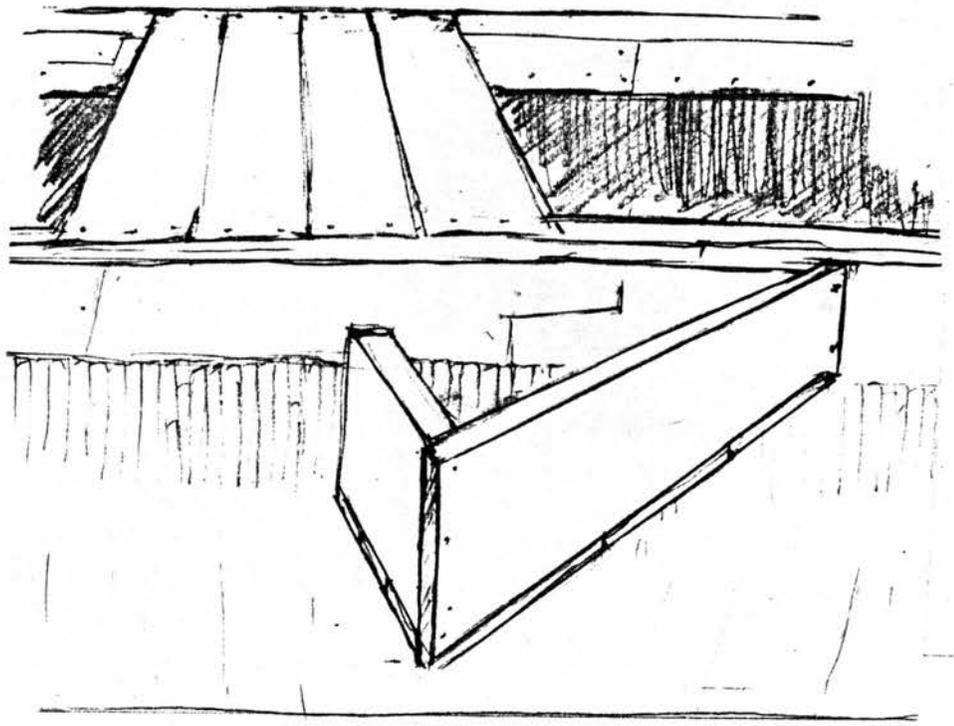
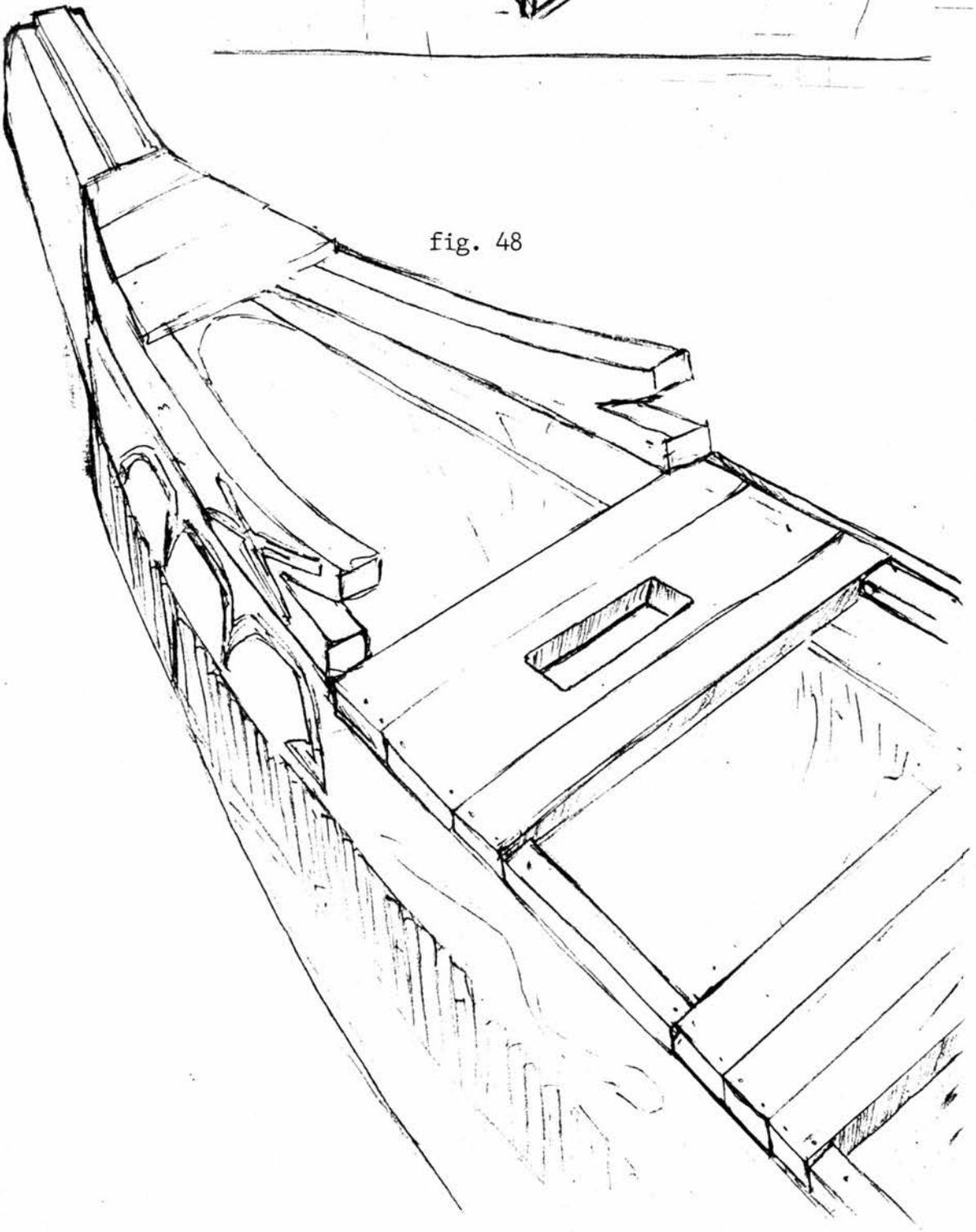


fig. 48



strake is run the length of the canoe on both sides; this is fitted flush with the thwarts and overhangs the planking by a few centimetres. The rubbing strake is also made from one of the hardwoods above or teak if it is available. Once the rubbing strake has been nailed to the gunwales, a distinctive feature on many Ghanaian coastal canoes is added to the bow section; in Fanti language the feature is called 'ntasso' which translates 'top piece'. Amongst the canoe carpenters and fishermen, the use of the top piece ranged from decoration to show which end of the canoe is the bow, to a rope cleat or anchor point. The thwarts and top piece are illustrated in fig 48. The top piece runs from the stem post back to the thwart nearest the bow where a V shaped notch is cut out to accommodate a rope. The bow is often finished off with a filled in area level with the top piece, which extends up to the end of the stem post.

An additional feature to the construction is the mounting bracket for the outboard motor (fig 49) which is either incorporated during the planking up stage or slots are cut into the completed planked up canoe. The position of the bracket depends on the height of the canoe's starboard side. The carpenters will often request to see the intended outboard motor to enable them to judge the height for the bracket. A slot is cut out of the dugout or planking to hold the back panel of the bracket which is usually made from a substantial piece of wood running through the slot to the opposite side of the canoe hull where it is secured. A second panel of wood is attached to the protruding end of the bracket piece back to the side of the canoe to form a triangular shape. The underside of the

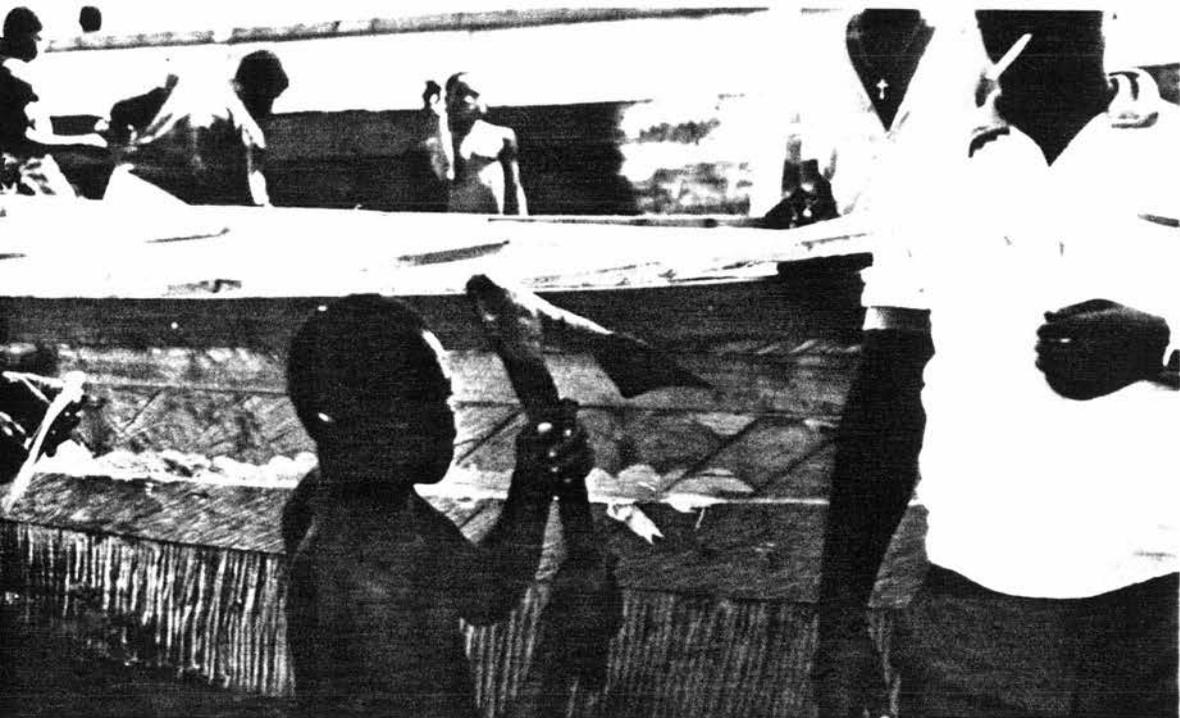


fig. 50



fig. 51

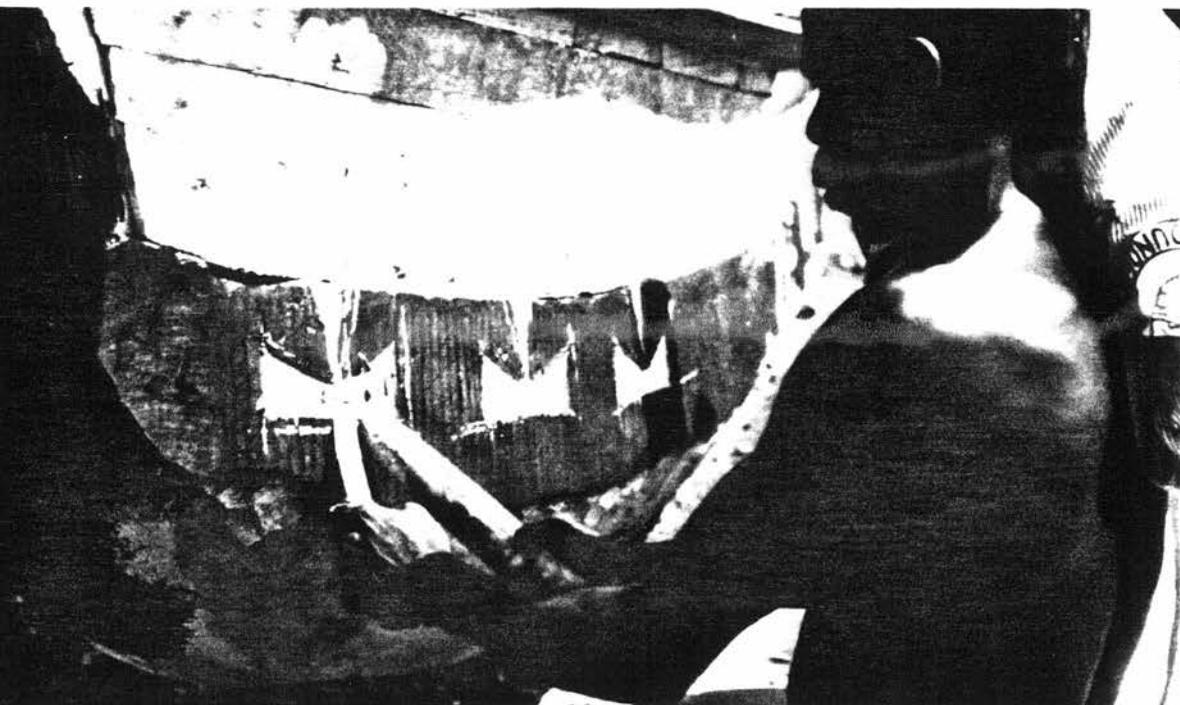


fig. 52

bracket is filled in with an under panel of wood to help prevent the splash of sea water over the outboard motor.

At this stage in the construction, a post is added near the bow section to attach fishing gear from and to hang a lamp for night-time fishing. Small chocks of wood are nailed inside the canoe below the planking on the dugout; these are for the fishermen to brace their feet against when operating the fishing gear and paddling.

This completes the work on the second phase of the canoe construction. The cost of rigging the canoe varies more than the cost of the dugout stage of the canoe construction. The cost depends on the carpenter's relationship with the canoe owner and the amount of materials supplied by the canoe owner. There is no real price control system operating amongst the carpenters; prices are subjectively decided between the canoe owner and the team of carpenters who carry out the work.

4:6 Canoe Decoration

After the completion of the construction phases of the canoe, the canoe hull is tarred with bitumen (seen in the background of fig 50) which is applied with rags by the canoe's future crew or the carpenters who completed it. The underside of the canoe is usually left untarred as the tar would be worn off with the abrasive action of the sand when the canoe is launched and recovered from the sea. The black tar is considered by some fishermen to be more as decoration than a wood preservative; some canoes are externally coated with black paint or simply charred to blacken the background for the

carved decoration. Completing the construction and preparation of the canoe in readiness for the carved decoration takes about two to four weeks. ⁸

The carved decoration is put on the canoe by one man who specialises in the fishing community with carving the newly completed canoes; like the carpenters he may not be a fisherman himself but is considered a craftsman. It takes the carver an average of two days to complete the carved decoration on a canoe. The canoe owner and the carver will discuss the required decoration which usually includes the name of the canoe owner or his company, the canoe's name, a proverb and some iconographic symbols. Work begins with the carver chalking the decoration on the gunwale of the dugout below the planking (fig 51). The carver will confirm with the canoe owner the accuracy of spelling and decoration in the correct place. When the carver is satisfied with the position of the chalk outlines he will repeat the decoration on the port side.

The tools of the carver are a single hand knife, carborundum stone and a short length of heavy wood which is used as a mallet (fig 52). With these tools the carver begins to carve the decoration in relief to a depth of about 2 cm; he works from the stern of the starboard side and completes each letter or symbol, moving along to the bow and again on the port side from stern to bow until the carving is completed. ⁹

The surviving carvings on the canoes remain to enhance the skills of the carver and perpetuate cultural tradition. The fishermen are proud of the society to which they belong and they want the

carved decoration to embody moral and wise sayings, proverbs, emotions and motifs expressing the philosophy of their ancestors. The decorations all appear above the water line, to be seen and appreciated by other canoe crews at sea. The decoration is also said to enable the crews to identify their canoe when a large number of similar sized canoes are beached.

Since at least the 1930's contemporary events, political, atmospheric and moral, have influenced the design along with the canoe gunwales and over the years many have become assimilated into frequently used designs, such as the anchor copied from European trading ships.¹⁰ Some modern iconography can be dated and traced - for example, the State Transport trademark, created during the 1960's, which has been used on canoes and has come to signify the swiftness of the canoe. By transferring contemporary signs of power and speed to canoes the owners hope to obtain the attributes of the symbol.¹¹ Football players in winning team strips are also popular. Moons and stars act as a visual reinforcement of luck to the fishermen, their canoes and community.

All panel compositions have a common groundline, implied by the placement of the motifs between the planking along the gunwale of the dugout where it meets the curvature of the lower hull. Some planked up canoes also have decorative motifs painted along the planking.¹² A multiplicity of design vocabularies is found throughout coastal Ghana, and few isolated styles can be considered regional, due to both the mobility of canoes and decorative carvers.

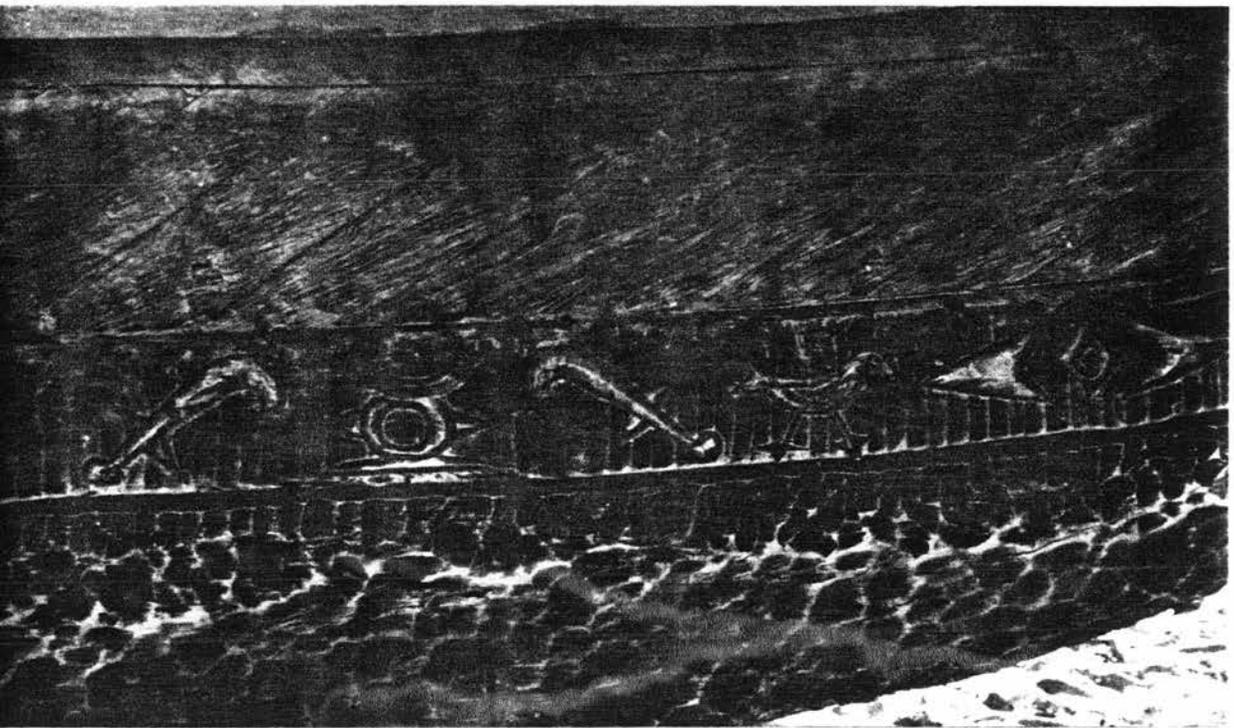
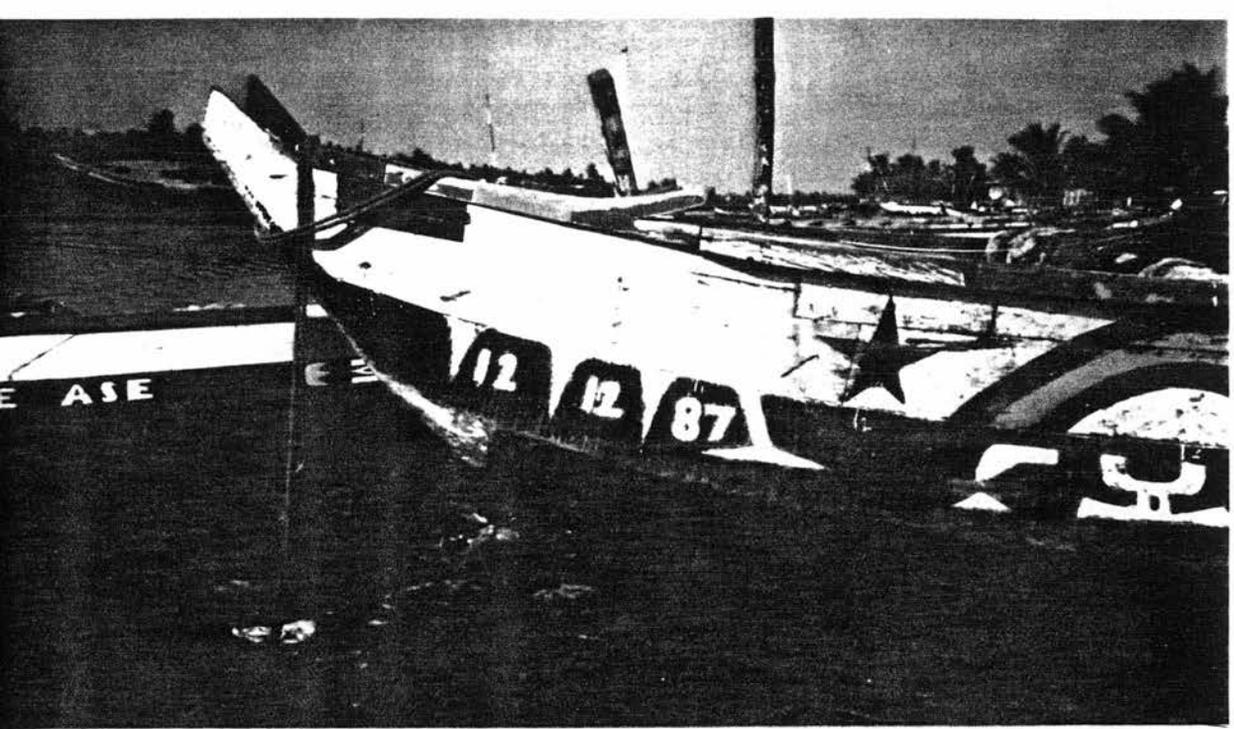
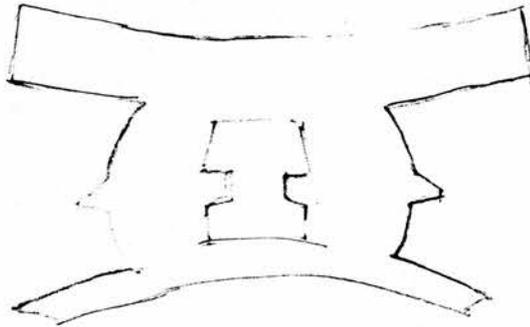


fig. 53

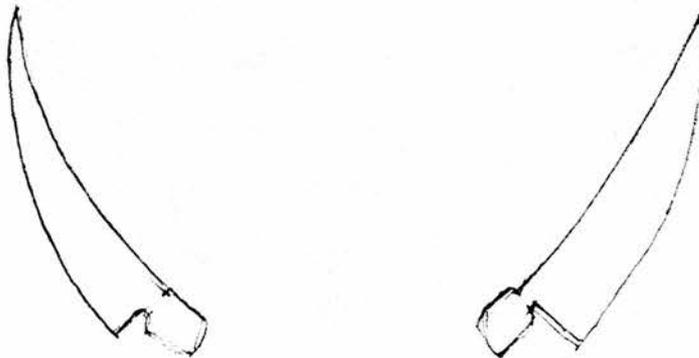
Following the carved decoration, the planked area and gunwales are painted by the canoe's future crew. Oil based paints are used in very bright primary colours; often the carved decoration is painted white or any colour to hand as this is more of an aesthetic exercise than a tradition. Examples of decoration are seen in fig 53.

A random sample of the symbols and motifs are explained below: ¹³

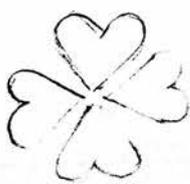
The stool - Ga people believe that the stool is the soul of society; it serves gods and is the symbol of kinship or royalty and therefore should have a rightful place in the middle of the canoe, central in the design.



Swords are symbols of authority and are positioned down either side of the stool.



The heart, either single or grouped, is an important life-giving organ and gives life to the canoe and the fishermen.



A bird with its head turning backwards signifies
'Be prepared for any eventuality'.



The anchor which is an illustration of the anchors
carried on trading ships seen off the Ghanaian
coast.



The five pronged star symbolises the star of Ghana,
African freedom.



The design on the bow of the dugout used to be
associated with the Accra district, but now adorns
most canoes from the entire coast.



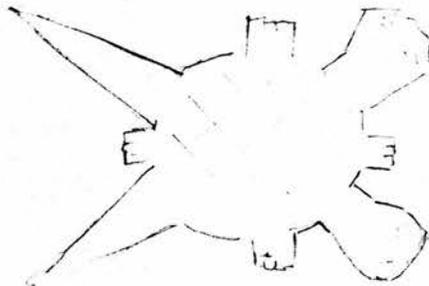
The snake and fish often appear together - the snake is waiting for food which the fish symbolises; when the fish comes the snake will take it.



The snake and the bird symbolise swiftness; this is compared to the snake in the grass which the canoe is likened to as it must have the same swiftness in the sea.



Two crocodiles with one stomach is illustrative of the saying 'That all may be one'.



CHAPTER 5

THE SOCIAL AND ECONOMIC CONTEXT

5:1 Rituals Surrounding the Construction of the Canoe

When the canoe is completely finished and ready to go to sea, the soul of the canoe is evoked once more, as it was during the ritual performed when the tree was felled to make the dugout in the forest. The belief of God plays an important part in Ghanaian life and three groups of religions are to be found: Christianity, Islam and indigenous traditional religions. There is a conception of hierarchy of spirits with major deities inhabiting the sea, rivers, lakes, hills, rocks and trees, then there are gods who might be worshipped through priests and priestesses at shrines and spirits which might be evoked to intervene with the almighty through the pouring of libation. The traditional religions and beliefs permeate the lives of almost all Ghanaians even when they are of other religious persuasions.

There are rituals still practised surrounding the felling of trees; spirits lodge in the tree which have to be attended to before the tree is felled. A ritual frequently practised by the canoe carvers involves offering eggs and libation at the base of the tree along with the incantations:

"Oh Wawa tree receive these eggs and eat,
do not let me be cut by the metal"

The eggs are broken by the carver who will fell the tree at the base of the tree and libation is poured on the ground as an offering to the spirits which

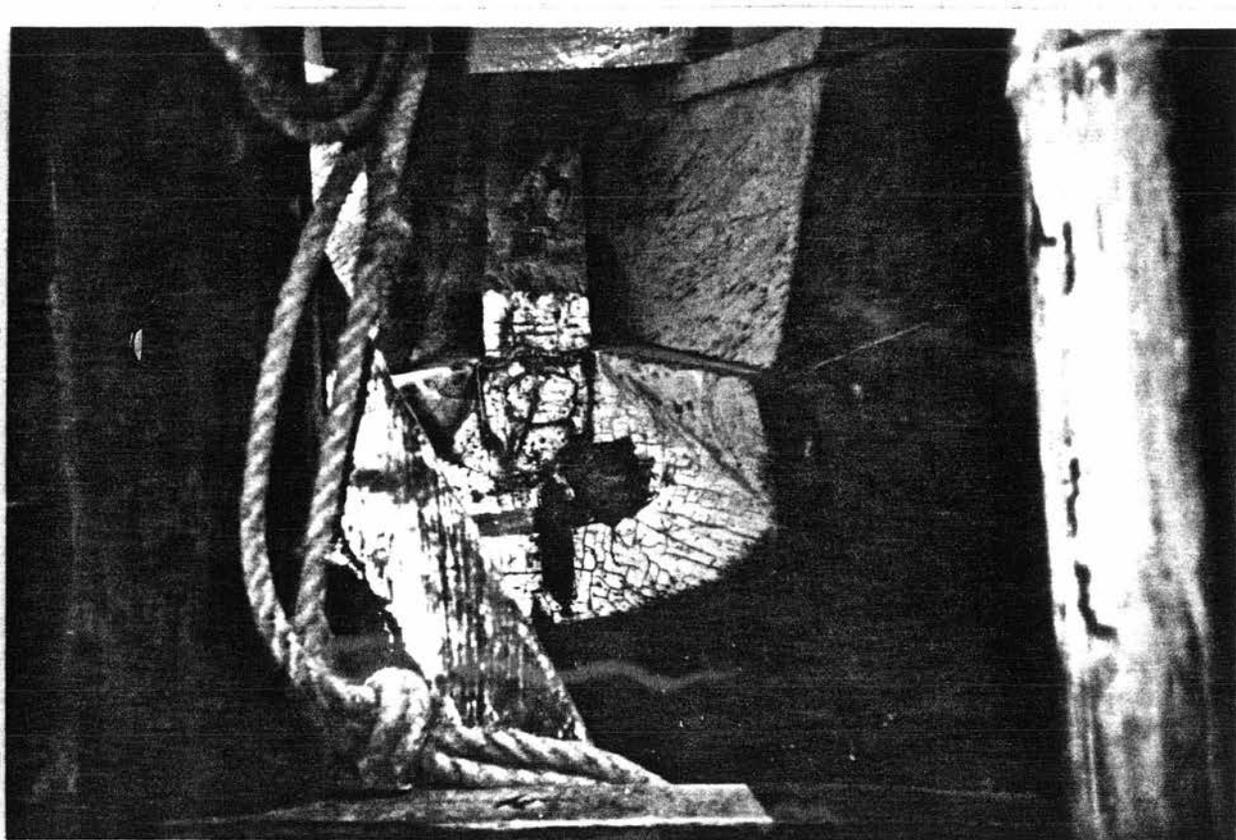
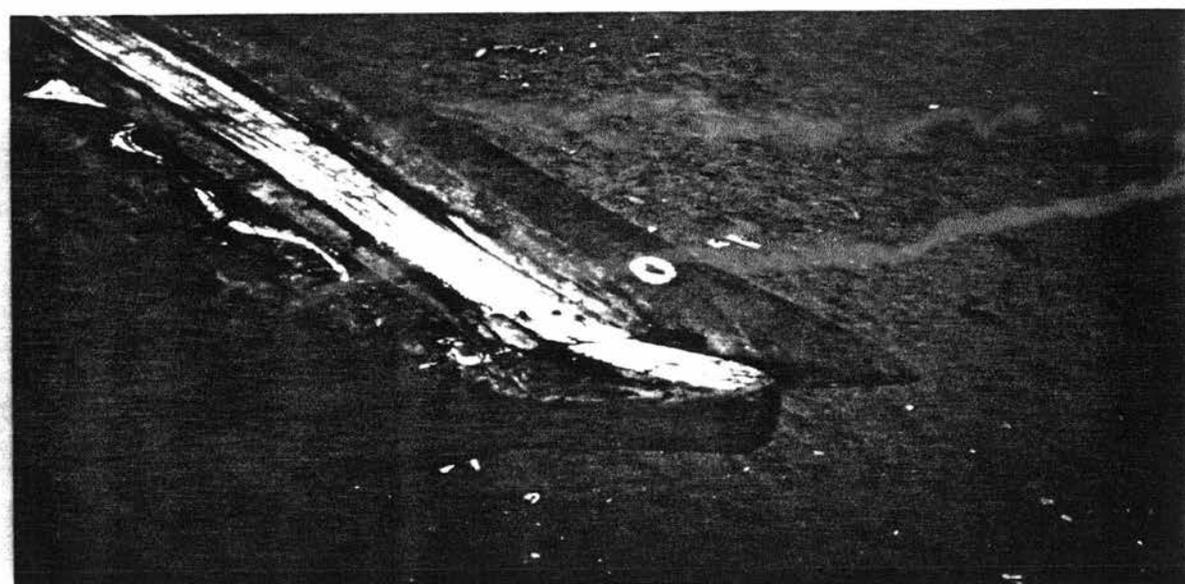
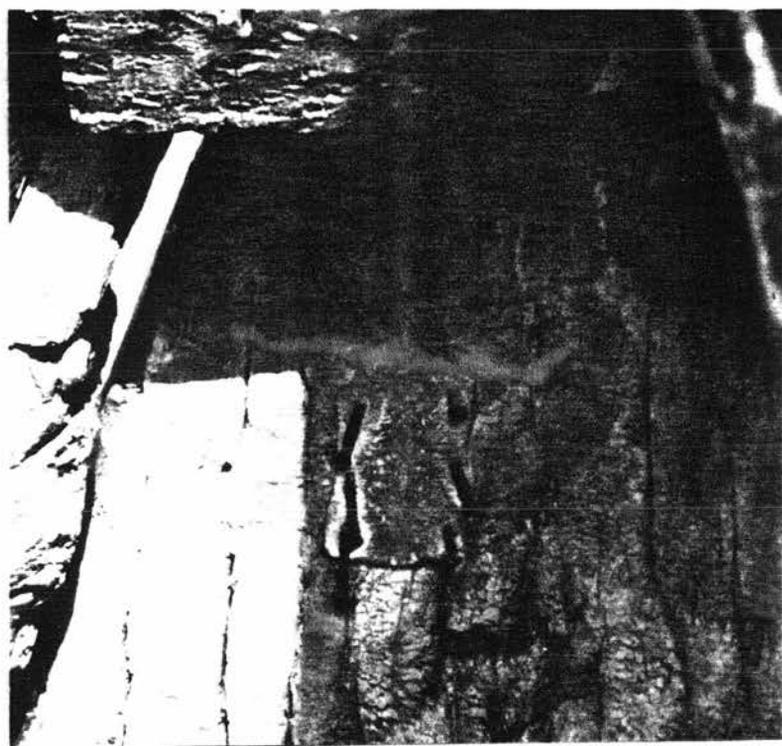


fig. 54



lodge in the tree.

"This tree is being cut down to make a canoe, so that the fishermen might go to sea and find something to eat. We pray, accept these eggs and gin to drink so that you the spirit might move away from the tree. May the life of the one who will cut the tree not be taken from him, or may he not hurt himself".

The wandering spirit whose habitation has been destroyed will once again enter the material substance in which it lives. This explains why subsequent rituals and ceremonies are performed on the finished canoe. The canoe thus becomes the shrine of the disembodied spirit of the Wawa.¹

When the canoe is ready to go to sea, it is pulled over log or pipe rollers to a convenient launching position on the beach. The canoe owner arranges for the naming ceremony to be performed by a local Fetish Priest or Juju man. This will occur early in the morning when the canoe's crew, the canoe owner and the fetish man gather at the new canoe. The canoe owner provides a bottle of Akpeteshi (local gin), some money and some strips of dry spear grass, two eggs and possibly a live chicken.

The fetish man will recite sayings as he strikes the bow of the canoe with the strands of spear grass. He gives thanks to the spirit then cracks an egg, first on the bow then the stern. If a fowl is to be used, the fetish man wrings the head completely off the fowl and he rubs the bleeding neck against the canoe, next he pours the libation on the ground below the bow.²

The fetish man will also score a few cuts into the inside of the dugout at the bow directly below the stem post, where a 'concoction' of herbs are pushed into the cuts and sealed with a piece of lead or copper plate nailed over the consecrated cuts. Some of the concoction is either tied in a piece of cloth³ or placed in a small bottle and hung from a nail fixed above the metal plate. These offerings can be seen in fig 54.

Some Christian fishermen and canoe owners will only pray for the safety and prosperity of the new canoe and those who fish from it. In the case of a canoe owned and worked by Christians, a small bottle filled with holy water is hung on a nail inside the bow of the canoe; sometimes a painted crucifix is drawn below where the bottle hangs.⁴

5:2 Launching the Canoe

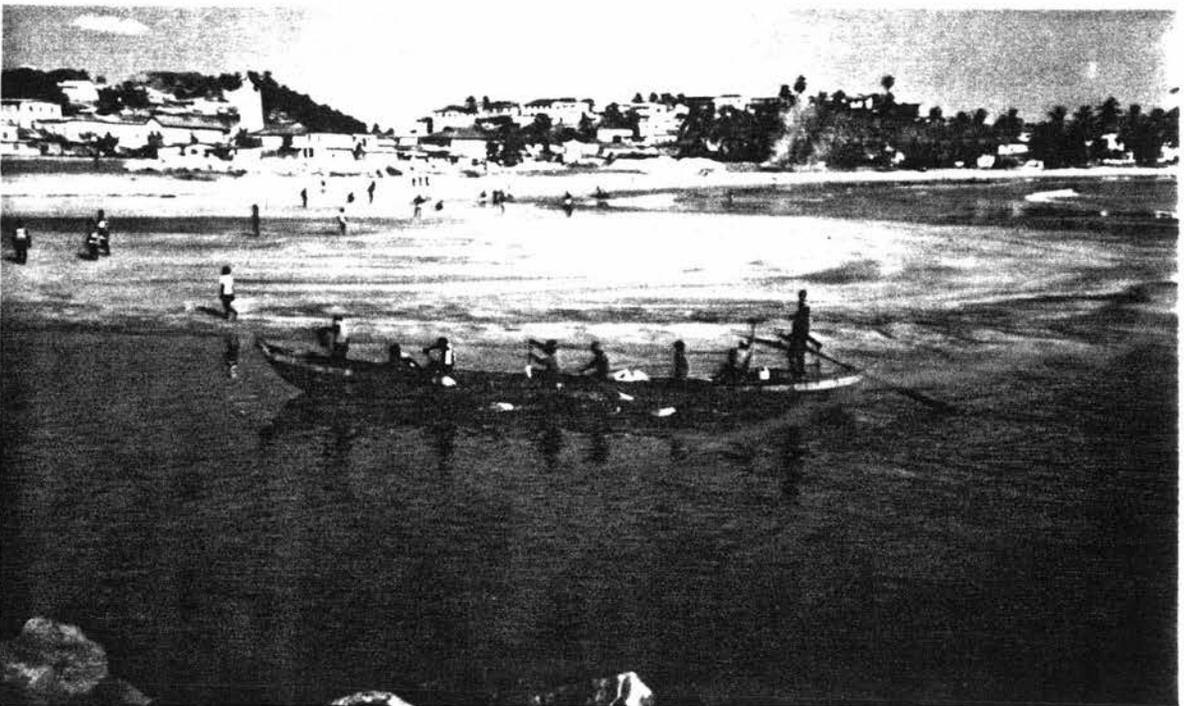
After the ceremony the canoe is ready to make its first trip to sea. Until this point in the construction there are no sea trials to determine how the canoe will perform. Many carpenters believe that the damage is already done in the first stage of construction if the canoe proves to be unseaworthy and that there is little to be done towards correcting any unbalance.⁵

The canoe is launched by its crew and any willing helpers at the beach, who push the canoe across palm logs or pipe rollers bow first into the sea. The canoe makes a short initial trip to test its seaworthiness. A new canoe is said to be very buoyant and may carry chunks of metal from a truck engine to help keep the stern end down in the water and keep the outboard motor at the correct

fig. 56



fig. 57



position.

Recovery of the canoe from the sea is done by running up the beach on a wave. When the canoe touches the beach, the crew jump out and haul it back up the beach, bow first, by pulling on a rope attached to the stem post; some crew members will push the canoe from the stern (fig 55). Small canoes are beached and swivelled about their axis up the beach; this is seen in fig 56.

5:3 Methods of Propulsion

Motorisation

The introduction of the outboard motor coincided with the first use of nylon netting in 1959 which meant the net size increased. With the expansion of the nets the greatest change occurred in the size of canoes which also increased, creating a need for motorisation of the larger canoes. The Fisheries Division of the Ministry of Agriculture, ⁶ who promoted the development of the capital intensive fishing sectors during the late 1950's/early 60's, looked for ways of improving the productivity of the canoe fleet, and began experimentation with the use of the outboard motor, which it was thought would enable the canoes to travel at faster speeds of up to 10 knots and help the fishermen to gain easier access to fishing grounds, enhance the fish catch, reduce crew numbers and make the canoe independent of wind or paddles.

Research was carried out on the optimum location and fixing method of the outboard motor to the canoe. Due to the hull configuration of the dugout

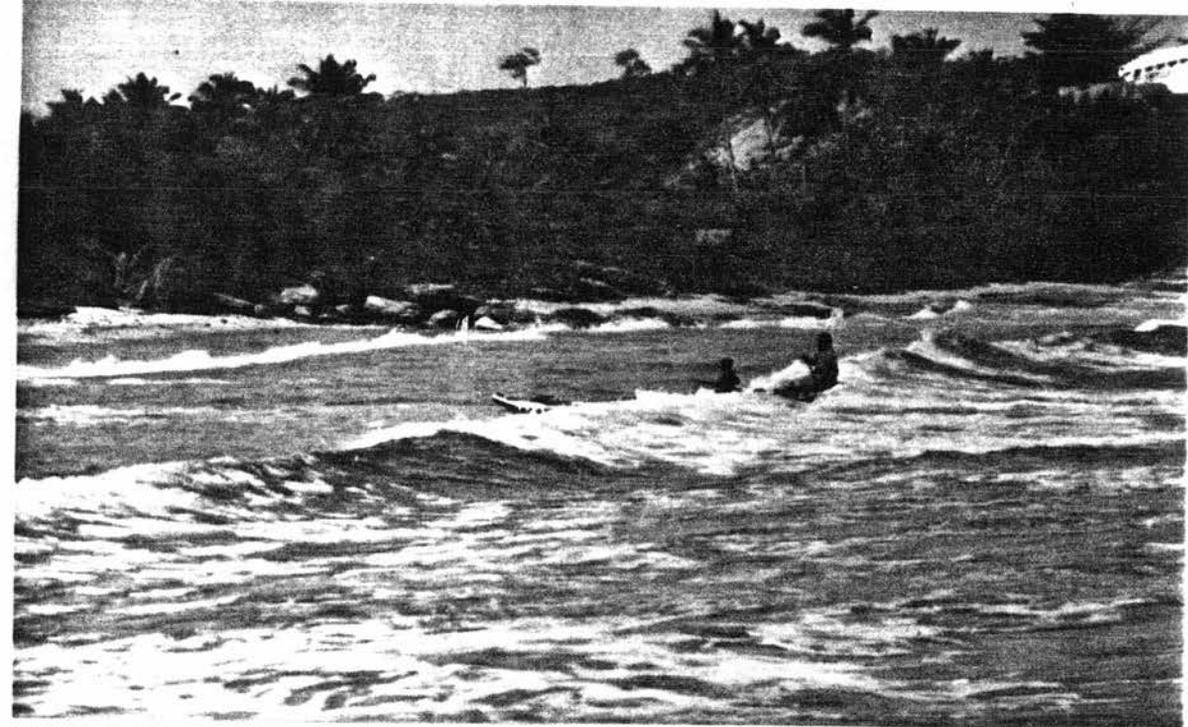


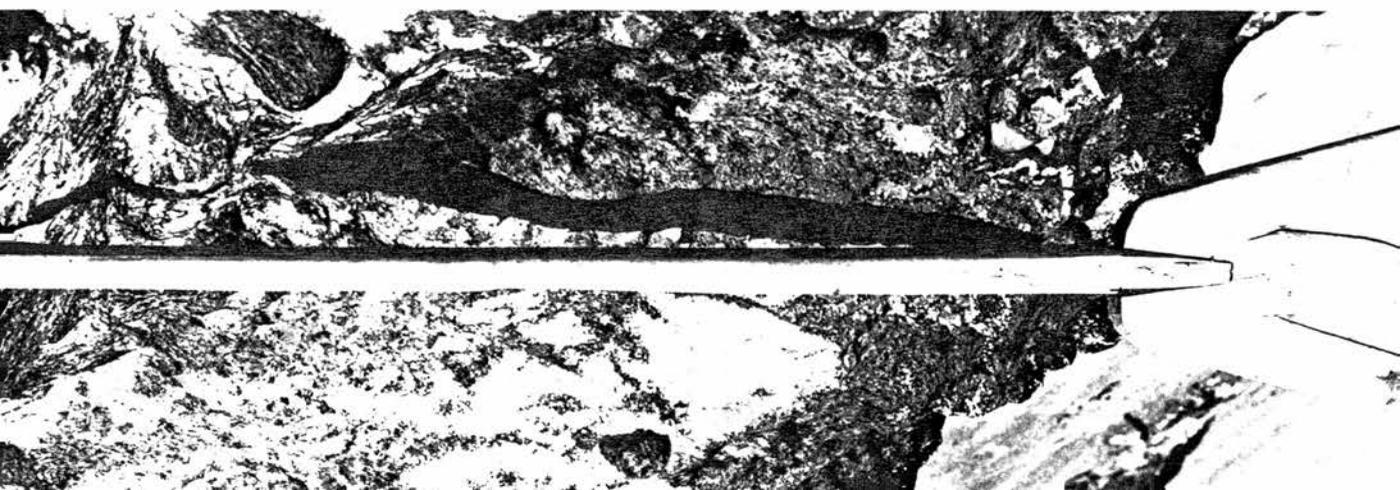
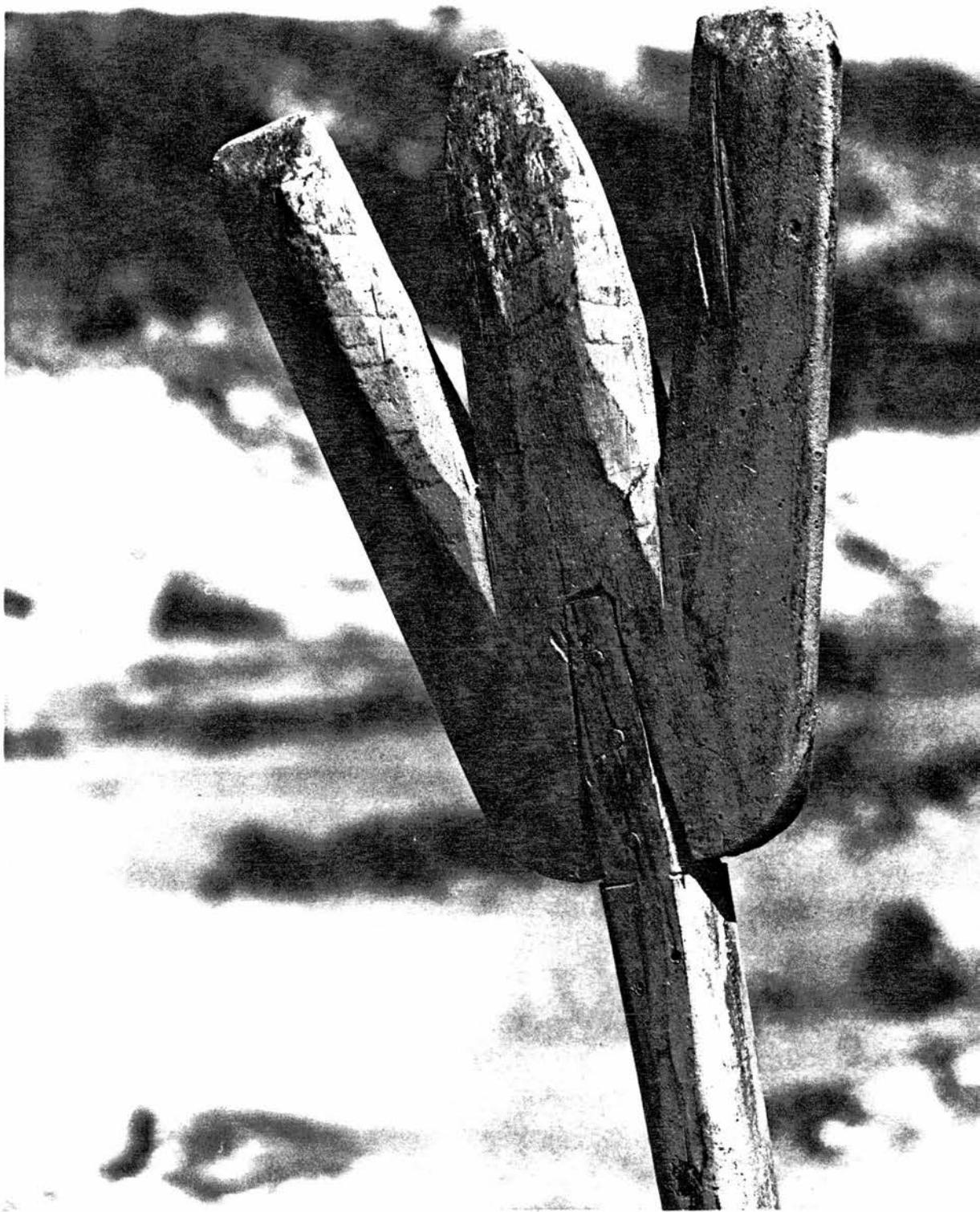
fig. 55

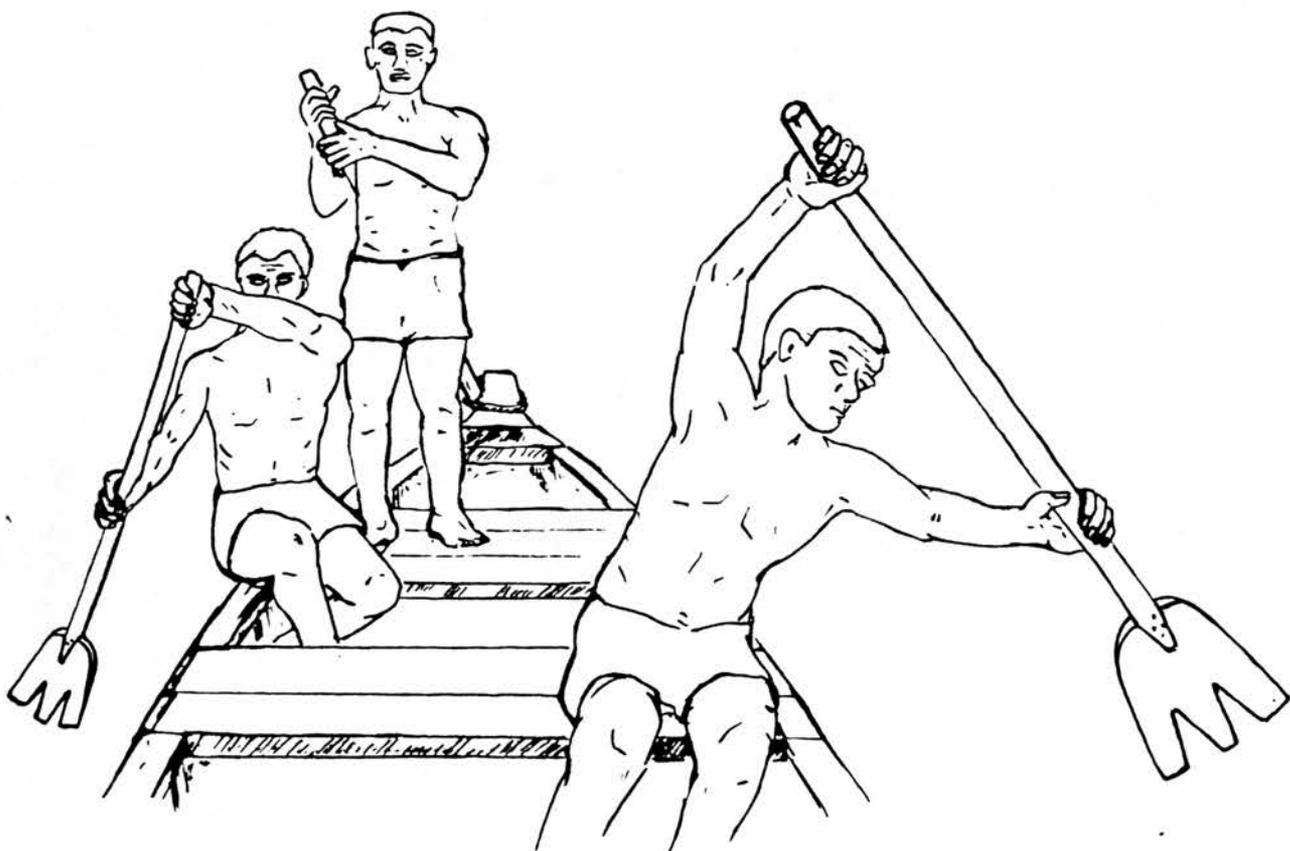
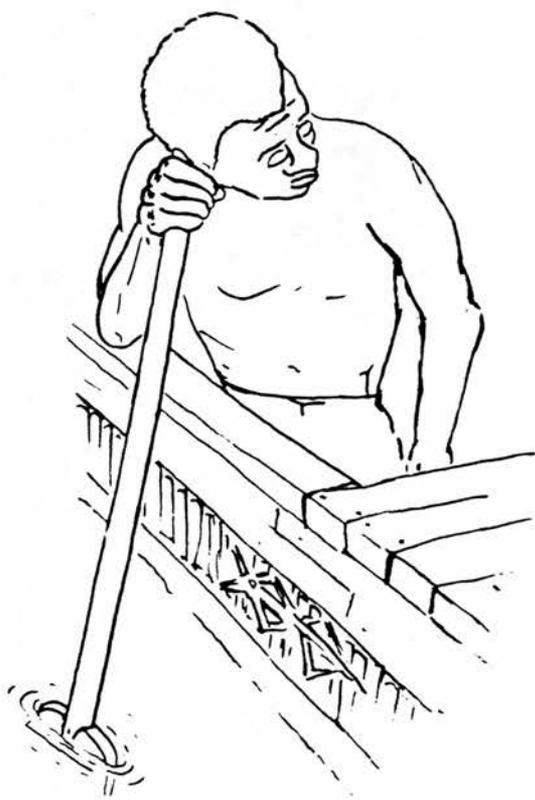
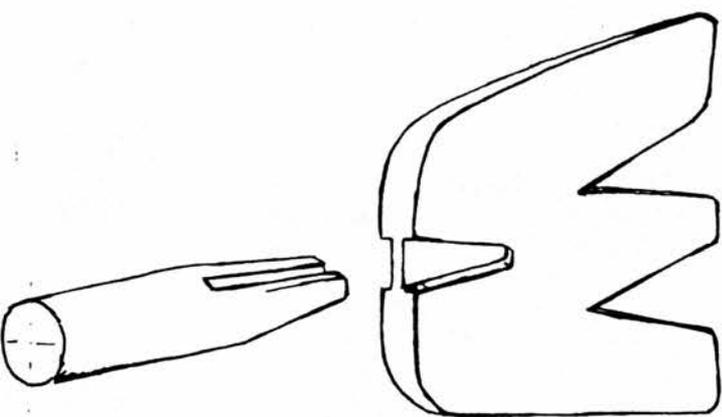


canoe there are structural and installation limitations. Testing the motor in four different positions was carried out by FAO staff ⁷ and performance tests were conducted with the motor fixed to the transom, side mounted and set in two differently positioned internal wells. The choice of the different types of installation was based on the several factors: speed, engine performance, cost of installation, loss of space within the canoe, steering the canoe and protection afforded from sea spray. One of the characteristics of the Ghanaian canoe is launching and landing through surf on hard beaches. The canoes are then dragged up the beach or 'walked' by swivelling the canoe about its centre axis. By cutting off the stern end of the canoe to fit a transom, walking the canoe would be more difficult. With the motor side mounted it was feared that the motor would be very vulnerable from collision with other canoes when beaching, and in this position the motor would be more exposed to sea spray. Side mounting an outboard motor would not alter the constructional structure of the canoe. With a cut out section in the well of the canoe and a box-like structure built up internally to mount the outboard motor, deterioration in the power performance was experienced during test trials, although at the time the motor installed within the well was found to be superior to the other methods of fixing the outboard to the canoe. Despite these findings the most popular and today the only location for the motor is on a side mounted bracket made from wood. This could show a reluctance for the fishermen and canoe carvers to change the structure and shape of the canoe to accommodate the modern technology of the outboard motor, as previously no other structural changes had occurred to the shape of the

dugout canoe, only a size increase which was a natural progression to accommodate fishing gear.

The introduction of the outboard motor brought along with it a new set of problems for the canoe fishermen - firstly, the heavy financial burden which acquiring a motor places on an individual fisherman, then fuel and running costs along with availability of spare parts. There has been an attempt by the Fisheries Department to at least standardise the make and models of outboards imported to Ghana (mostly Yamaha 25 and 40 hp motors), to alleviate some of the maintenance problems. However, the fishermen do experience problems obtaining spare parts and help in the servicing of their outboard motors. Once a crew is used to operating the canoes under propulsion of outboard motors, there is a reluctance for the crew to revert to sail or paddle when the motor is in for repair on the shore, which loses fishing days, although out of necessity the crew will paddle back to the shore when they experience engine failure which is a common occurrence. The estimated life span of the 40 hp outboard motor is between two and four years.⁸ The outboard motor only replaces the traditional methods of propulsion⁹ as the steering of the canoe is still accomplished by the bosum or strongest, most experienced member of the crew who stands aft with a long steering oar which is loosely lashed by rope to the stern post. Steering a canoe under outboard motor power is shown in fig 57. The size of the steering oar varies in length between 4 and 6 metres depending on the size of canoe. The oar has a graduated flattened blade which is approximately 1 to 2 metre of the oar's length and 20 cm at the broadest width. A single piece of Odum or Mahogany is used to make the oar



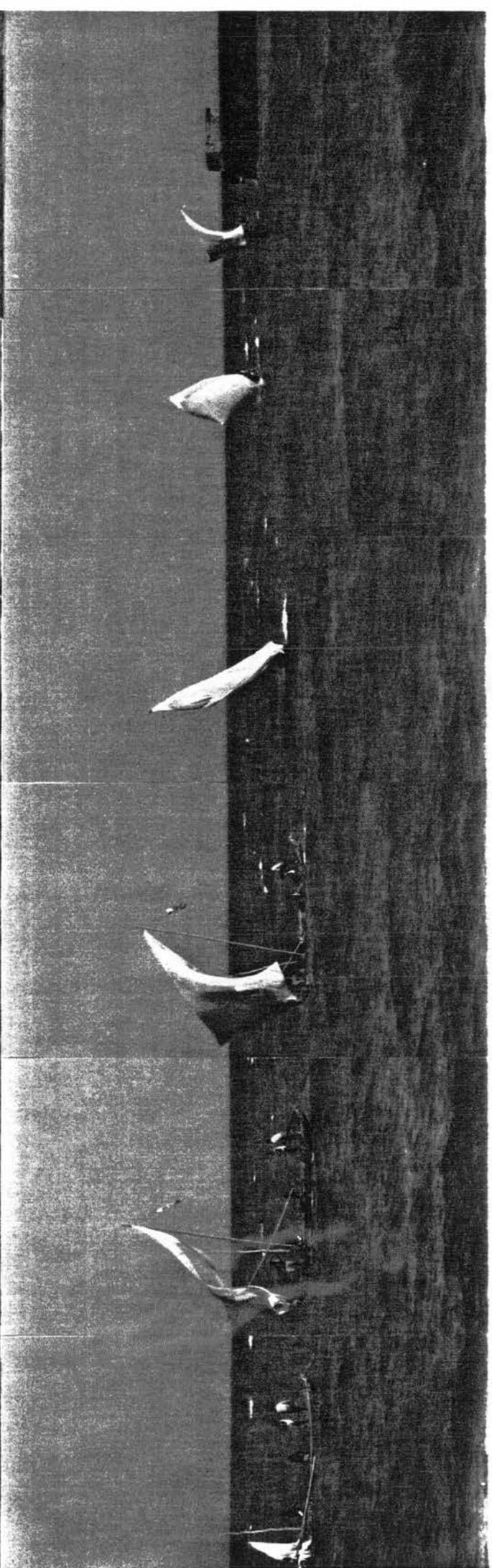


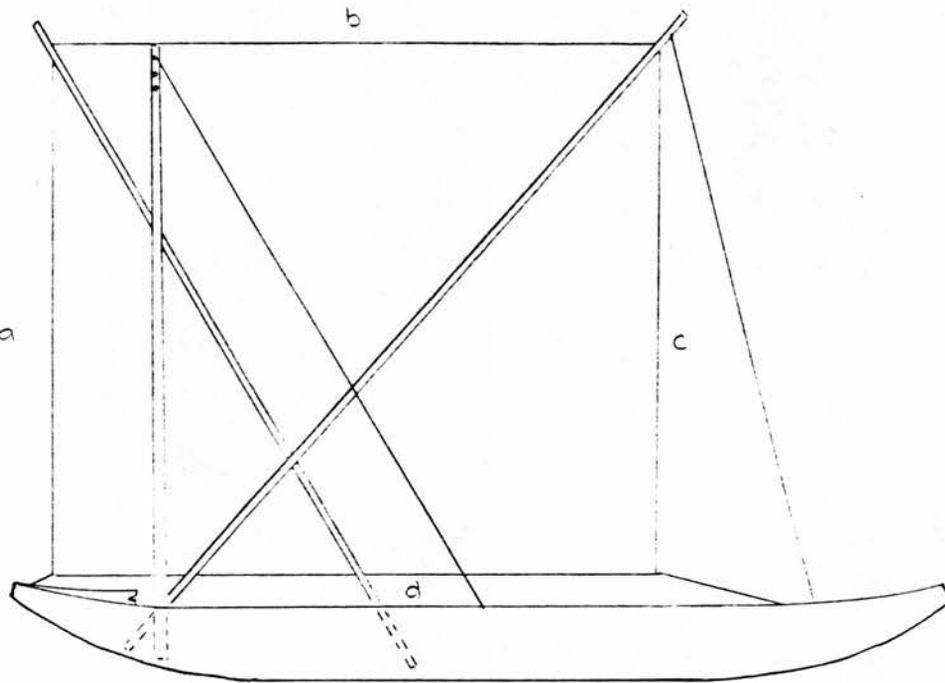
and the name of the canoe is often carved onto the blade.

Paddles

The trident paddle has been depicted in illustrations since the 17th century and remains in use today as the paddle carried on the majority of seagoing canoes. The three pronged shape of the blade is believed to come from several sources; an evolution from the time when the hand was used to propel water craft, the number 3 which Ghanaian people believe to have occult significance as a symbol for life and the paddle may have been made to resemble the foot of a swimming bird.¹⁰ The paddle is made in two pieces from a variety of local wood: Crabwood, Senegal Rose Wood, African Kino and the buttress of the Wawa.¹¹ The paddle is 5 handspans (1 m) long for the handle and 1 handspan plus 4 fingers in length for the blade (length overall 130 cm). The fishermen either carve their own paddles or buy them from local carpenters. Fig 58 illustrates how the blade and handle are cut to form a joint when nailed from both sides of the blade (shown in fig 59).

It was explained to me by several elderly fishermen how the paddle could be used as an instrument to determine the presence of fish in the sea - 'The canoe is stopped without using the anchor, an experienced fisherman pushes the whole blade of the paddle into the sea and he grips the end of the handle in such a way as to create a hollow. The fisherman then puts his ear close to the cupped hollow of his hand as shown in fig 60. The fisherman knows the different sounds uttered by the different fish, as the hunter knows the cries of





Sail Plan for 12m canoe. Scale 1:100

Sail Table of Measurement

sail length of sides

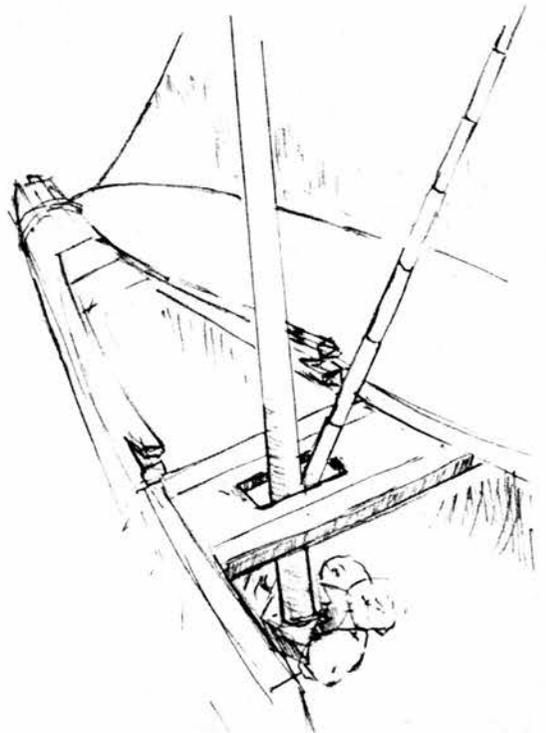
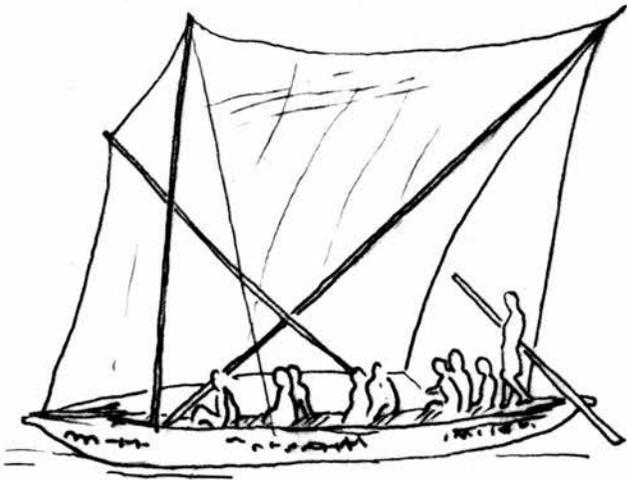
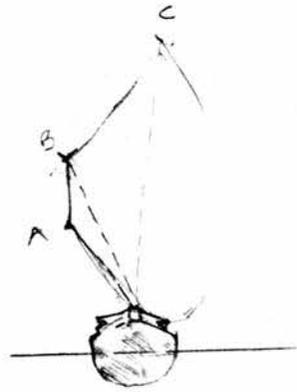
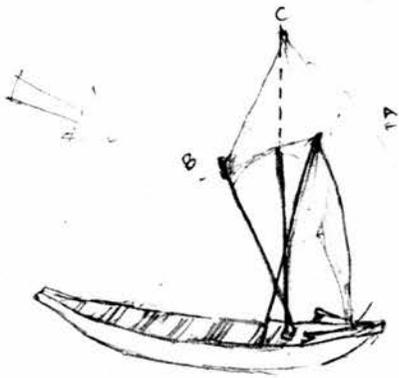
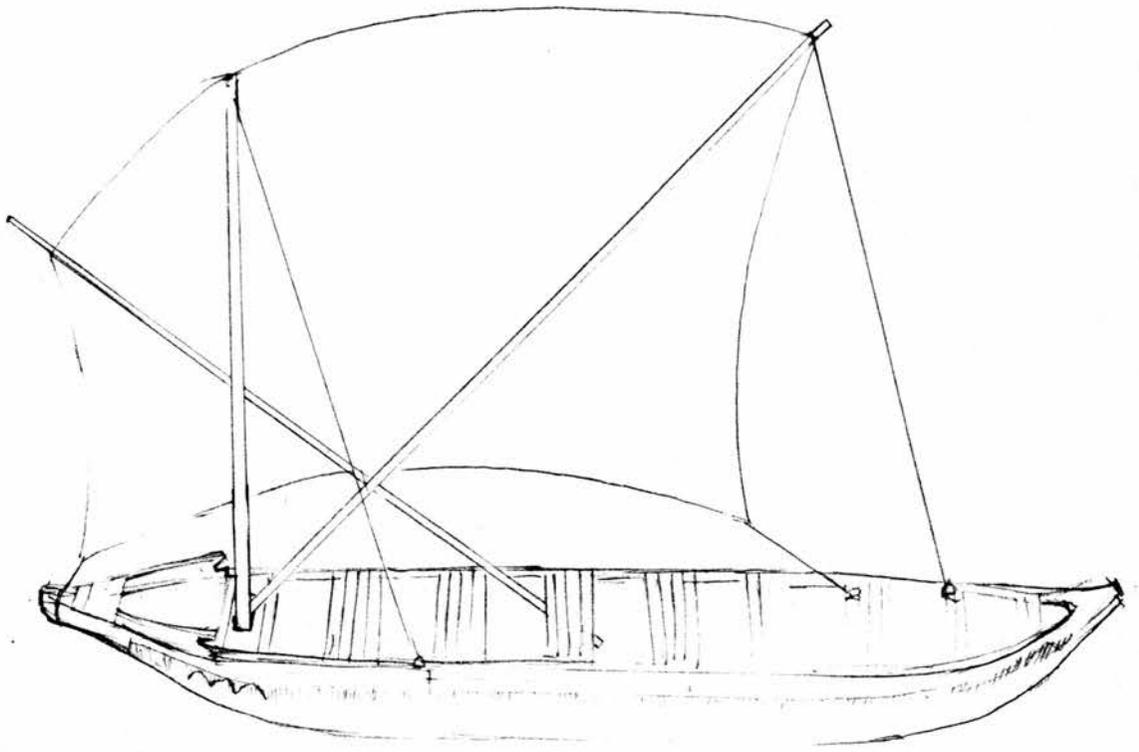
a b c d

6.0 7.4 6.3 7.9 sail measured at Elmina

7.8 9.0 7.5 8.8 sail measured at James Town

8.0 9.0 8.0 9.0 measurement taken from FAO
Catalogue of Small Scale
-Scale Fishing Gear of Ghana

When the canoe is rigged for sail the mast is shorter in projection to the sail than the above sail plan illustrates



wild animals'.

Sail

The medium size canoes utilise sail power when travelling to and from fishing grounds. The shape of the sail varies from square to rectangular and there are no set sizes for the sail area which is made from cotton cloth or recycled cotton flour sacks, obtained from local bakeries. Sails are sewn up by fishermen, their wives or local tailors. The sail is set by first stepping an unstayed wooden mast through the rectangular slot cut into the thwarts near the bow, one corner of the sail is attached to the top of the mast, a second corner is tied off at the stem post. One of the two bamboo spars, which are both longer than the mast, is positioned through the slot in the thwart along with the mast and raises the tallest corner of the sail. The second spar is attached to the sail about a third of the way between the mast and the first spar, the free end of the second spar is secured in varying positions between the thwarts. A rope halyard runs from the top of the first spar to the stern of the canoe. The angle of the sail is controlled by a rope or sheet at the lower rear corner of the sail which can be tied off near the stern of the canoe. This makes a low cut lug sail which can easily be raised and lowered to the canoe when running ashore through surf. The sailrig is lowered in the reverse order to hoisting the rig which can be seen in fig 61 as two canoes return under sail to James Town.

Leeboards are occasionally used in conjunction with sail to check the canoe from drifting sideways. The leeboard is attached to the downwind side of

the canoe between the mid section and the stern, and the steering oar acts as the rudder. Most canoes carry an anchor, either made from a stone enclosed in net on a length of rope or any heavy metal object; western style anchors are also carried.

5:4 Life Expectancy and Repair of Canoes

There are many factors affecting the lifespan of the large canoe. The canoes are subject to human error and natural hazards which shorten the life span of the canoe, normally estimated at between four and ten years, with the average of six years.¹² The commonest problems which affect the structure of the canoes are capsize, running aground on rocks and collision with each other, especially when returning to landing beaches crowded with canoes. Capsize is a problem for canoes operating through surf; when canoes turn broadside on to the waves they may be rolled along by the wave action into shallow water where structural damage will occur. Capsize in deep water due to the canoe being off balance during the hauling of gear or rough seas is less of a problem as it is fairly easily righted and bailed out by the crew using buckets and calabashes. After such an occurrence the outboard motor is often swamped and the crew will either paddle back to shore or receive a tow from another canoe.¹³ A number of canoes are reported to collide with large steel vessels during poor visibility and night fishing. Canoes and crew are occasionally lost at sea. Fig 62 was hauled ashore and put on its side to assess damage.

Under normal conditions a canoe's foremost enemy is

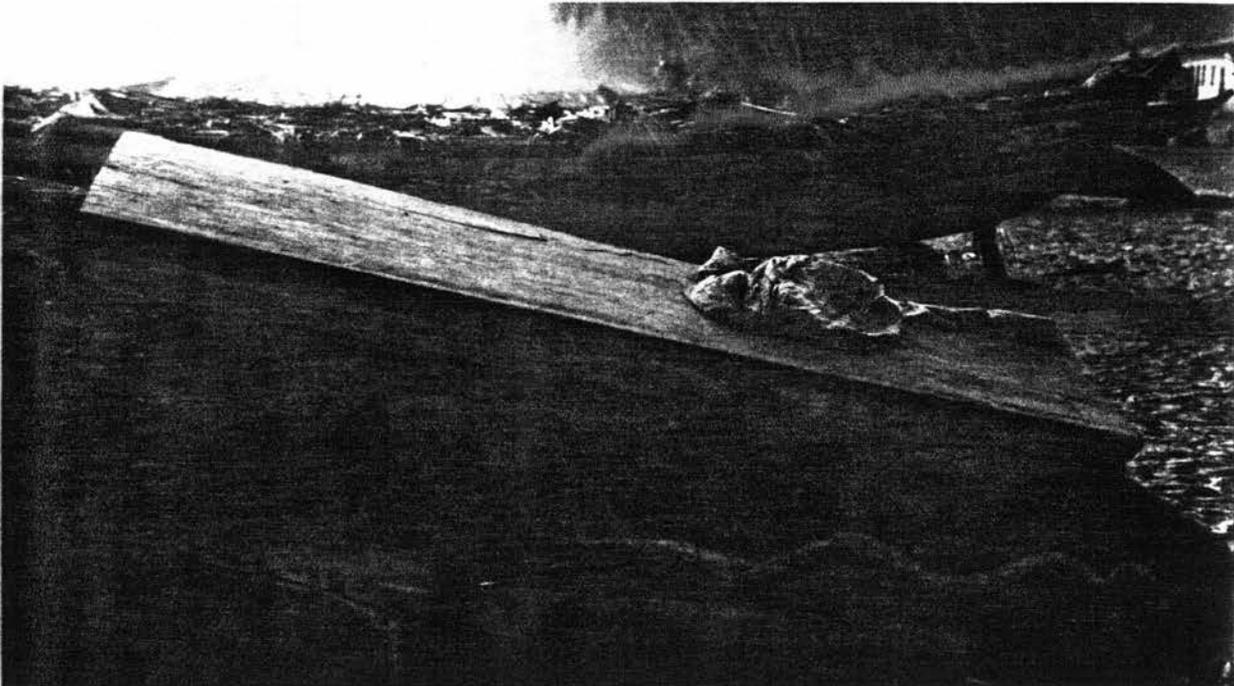
fig. 62



fig. 63



fig. 64



the shipworm. The marine wood borers have been identified as the teredo common to West Africa. Many species are distributed along the Gulf of Guinea and different members of the species may be recorded from different localities along the Ghanaian coast.¹⁴ The teredo attack the underside of the canoes (fig 63). The teredo is a distant relative of the clam and spends its entire life within the confines of a single piece of wood. Thousands of teredos may colonise each square metre of exposed surface. Teredos convert the wood fibres into the soft substance of their bodies and finally empty the space when they die¹⁵, riddling the wood with honey combed burrows which crumble on impact of beaching the canoes.

Visible area of teredo damage is cut out from the canoe and a patch cut to replace the weakened structure as explained in section 4:2. Large sections are frequently replaced either with a corresponding piece from an abandoned canoe or a new piece of timber (fig 64). Patching materials include sheet metal nailed over cracks in the canoe and rubber tyres are cut up and flattened over splits in the hull. Occasionally canoes are brought ashore dried out and recharred to drive out the marine boring molluscs before being repainted. In some coastal areas the canoe owners are having to repair canoes to prolong their lives further than they would have five or ten years ago.¹⁶ The fishermen are experiencing more difficulties in finding a canoe carver who will select a tree and carve a canoe whilst staying within the prearranged price for the order. Fishermen complain that the canoe carvers are increasingly reselling an ordered canoe to another fisherman who is prepared to pay a higher price. Therefore canoes which in the past

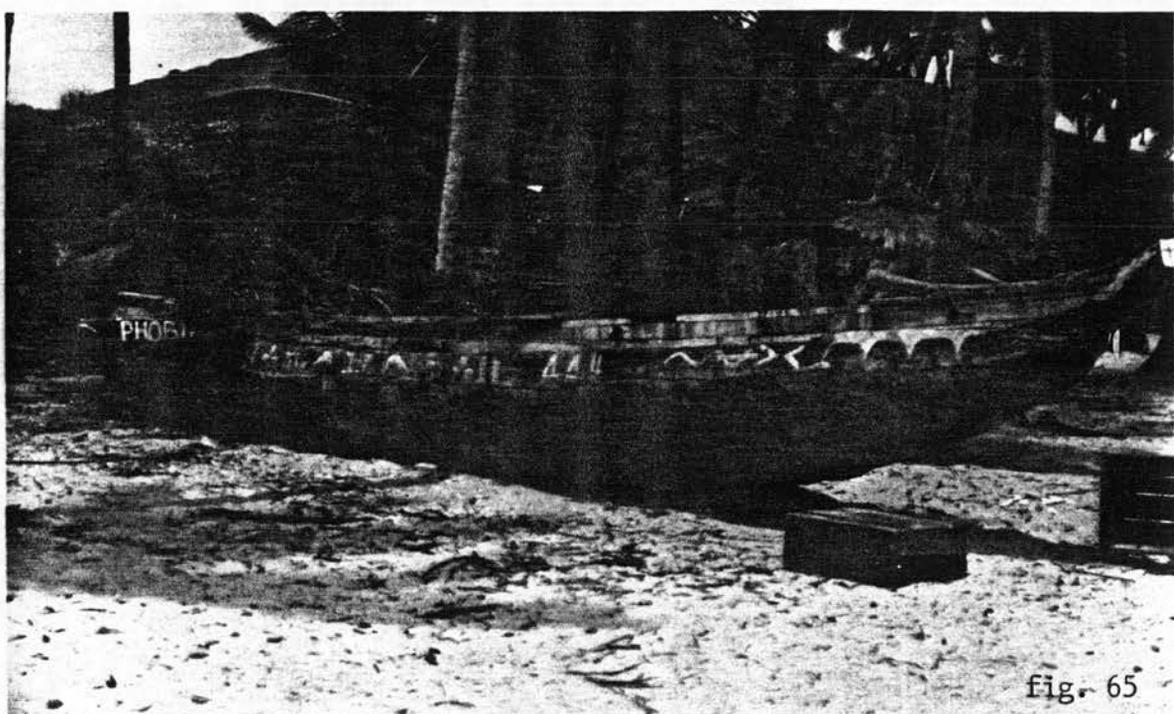


fig. 65

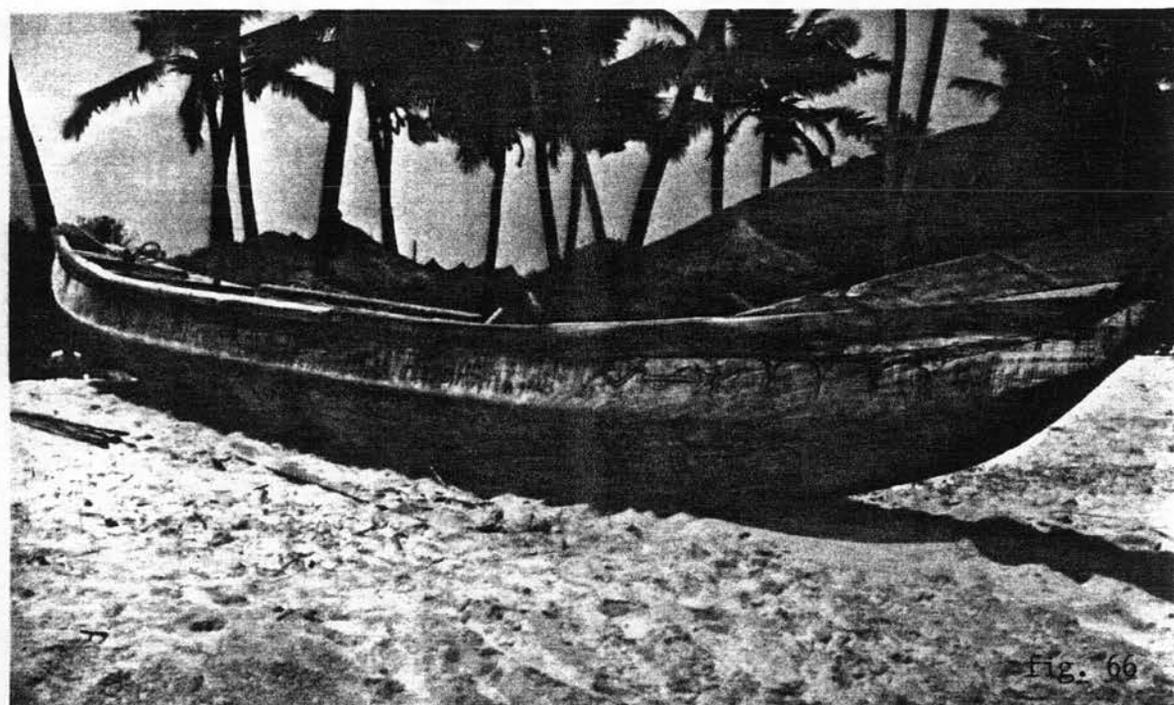


fig. 66

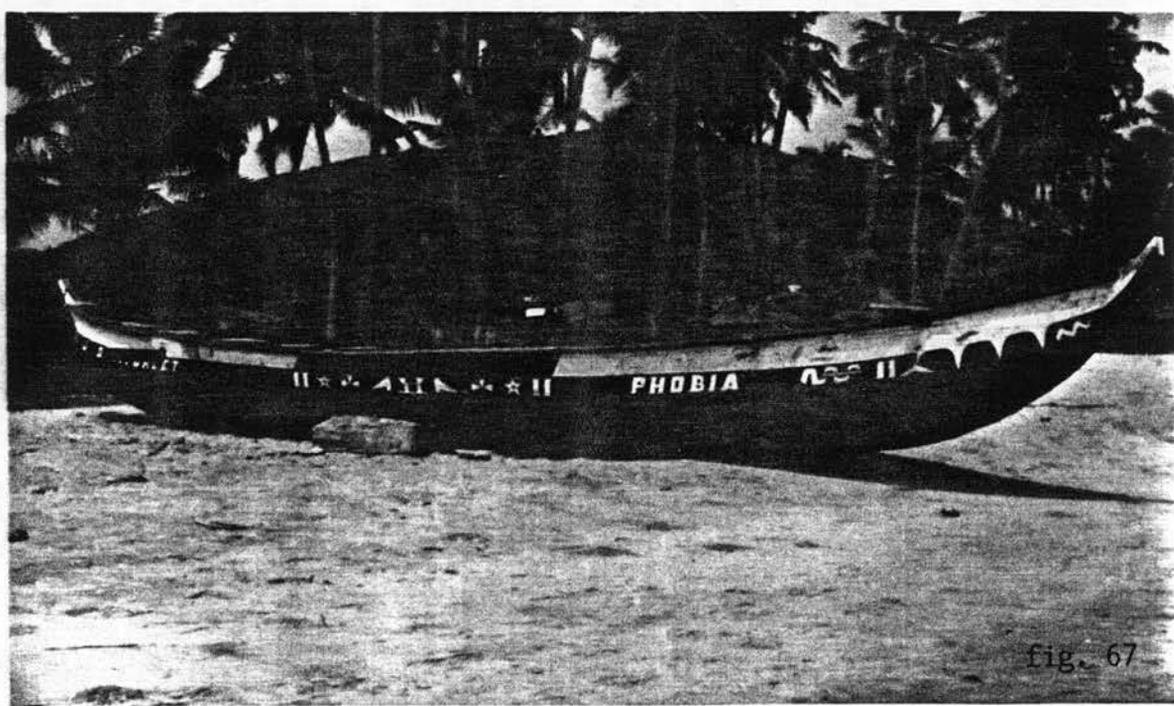


fig. 67

would have been abandoned are now heavily repatched.

Figure 65 to figure 67 represent three generations of the same canoe, 'Phobia', which are owned by one fisherman and operated by his sons and a local crew.

Fig 65 is approximately eighteen years old and was abandoned five years ago when it was dragged up to rest on the upper reaches of the beach from which it had been operating. During the canoe's working life considerable repair work was carried out and when an outboard motor was acquired, the sides of the canoe were planked up to a greater height than the original construction of the canoe. All that remains of the original structure is the mid section of the hull below the carved decoration.

Fig 66 was made approximately ten years ago for use as a beach seine canoe and occasional hand lining. This canoe has never been motorised but is propelled by paddles. The planking is lower on this canoe compared to fig 65 and fig 67.

Fig 67 is less than one year old and was made to replace fig 65. This canoe was carved in the Ashanti region by the same company of carvers who constructed fig 66. A 40 hp outboard motor is used together with gill and seine nets by a crew of between twelve and twenty-three men.

As the canoes have been owned by one man, the same name and carved decoration has been carried over to each of the three canoes.

Comparative sizes of the three canoes are given in Table 4.

Table 4

Sample of canoes measured - the canoes were randomly selected on account of their accessibility. Length measurement was made above the thwarts along the centre line of the canoe excluding the stern and stern post extensions. The maximum beam measurement at the dugout allows an estimated 20 cm for the width of canoe sides where it was not possible to measure between the planking to the exterior of the dugout. The extended beam was measured to the outside of the gunwales. Internal depth was measured at the mid section of the canoe, from the thwart down to the canoe floor.

Location & Age of Canoe	Overall Length	Beam at Dugout	Beam at Gunwales	Interna Depth
James Town, new canoe	15.80	1.58	1.90	1.04
James Town, new canoe	15.44	1.72	Dugout only	
James Town, 4 yrs.old	15.00	1.52	1.86	1.10
James Town, new canoe	16.85	1.80	2.16	1.14
James Town, 1 yr. old	17.10	1.64	2.10	1.25
James Town, 2 yrs.old	15.80	1.58	1.95	1.15
James Town, 5 yrs.old	16.00	1.70	2.04	1.20
Elmina, 3 yrs. old	15.05	1.45	1.68	1.26
Elmina, 2 yrs. old	15.40	1.38	1.80	1.17
Elmina, 2 yrs. old	15.15	1.50	1.82	1.06
Desere forest, dugout	15.50	1.90	Dugout only	
Desere forest, dugout	15.82	1.86	Dugout only	
Mile 16, 18 yrs.old abandoned	13.36	1.42	1.46	0.80
Mile 16, 10 yrs.old	13.00	1.55	1.58	0.86
Mile 16, 1 yr. old	15.76	1.64	1.96	1.08
Mile 16, new canoe	16.65	2.00	2.42	1.12
Ankaful, age unknown abandoned	15.92	1.52	1.90	0.98

Location & Age of Canoe	Overall Length	Beam at Dugout	Beam at Gunwales	Intern: Depth
Ankaful, 6 yrs.old	17.20	1.90	2.10	1.10
Ankaful, new canoe	16.45	1.64	2.14	1.16
Ankaful, 3 yrs.old	16.30	1.85	2.20	1.06

5:5 Organisation and Infrastructure of Canoe Fishermen

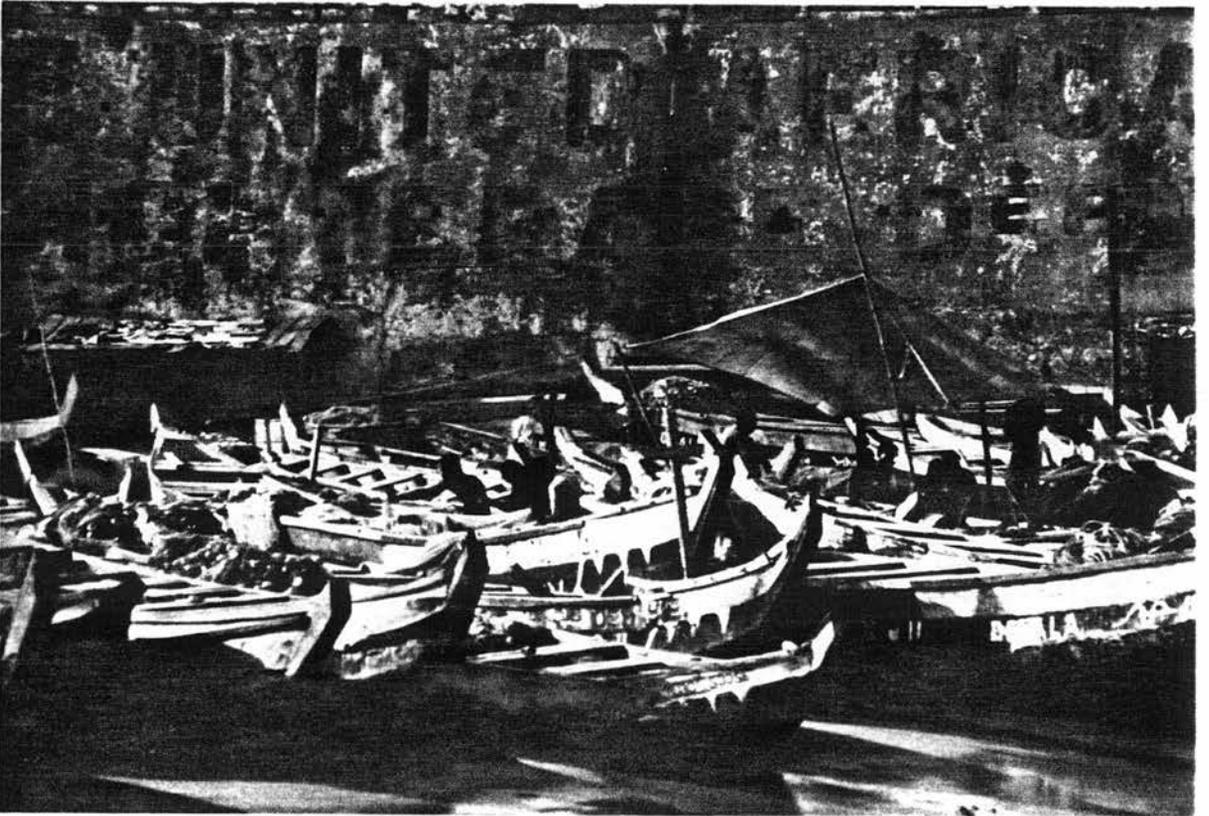
All canoe fishermen are responsible either to the chief fisherman of their home fishing grounds or to the chief of the area in which they are working. Each locality has its own self-appointed chief to the fishermen. The chief is often a respected elder of the fishing community; his responsibilities are to look after the welfare of all canoe fishermen within his quarter.¹⁷ The position of the chief is deeply rooted in Ghanaian tradition and history. It is a position often handed down to the son when the chief feels too old to be actively involved with the fishermen both on the shore and in his quarter.

The chief ensures the observance of the traditional religious taboos, many of which serve as a way of preserving the industry and ensuring better fishing. Prohibition of fishing is on a certain day, usually Tuesday when the sea goddess requires the fishermen to abstain from fishing; this is from sunset on Monday to sunset on Tuesday, as Wednesday's fishing trips begin on Tuesday evening. The day of abstinence from the sea makes time available for all fishermen to repair canoes, mend nets (fig 68) and the general upkeep of fishing gear. The chief performs customary duties and rites to enhance good catches by fishermen in his area. In June when

fig. 68



fig. 69



millet is sown to foretell the prospects of the coming year, the chief fisherman sows 'the hundred seeds of the fishermen'. It is the chief who sends canoes out to open fish seasons such as the sea bream in June. ¹⁸

The chief is the spokesman for the fishermen operating within his area; he settles disputes among the fishermen. It is to the chief that fishermen may present their problems and suggestions; he has the right to prevent the use of certain fishing gear and techniques if he feels they may be prejudicial to fishing. At times when fish are scarce, the chief is consulted as to the appearance of the weather and stars. The landing and selling of catches by non-resident canoes is at the discretion and approval of the chief fisherman. It is the chief who will organise searches for missing canoes and crew along with lost nets and gear. He is also the man through whom the Fisheries Outreach Programs are conducted. His position is recognised by the government. The chief fisherman used to play an important role in the teaching of fishing techniques to young boys, who would learn from a chief fisherman how to cast nets and paddle a canoe for a period of about two years. Once this apprenticeship was complete the chief would furnish the boy with a cast net, paddle and calabash bailer. The boy's father would either provide the boy with a small one-man crew or take him onboard as a crew member. ¹⁹

These days the young boys learn only from their fathers or relatives. The role of the chief fisherman is gradually diminishing as is the passing on of fishing knowledge, which many feel is a great loss.

All fishermen and chief fishermen belong to the 'Ghana National Canoe Fishermen Council' which was established in Accra in 1979 to protect the interests of canoe fishermen within the fisheries as a whole. When independent chief fishermen cannot resolve a dispute they will confer with Nii Abeo Kyerekuanda IV, the head of the GNCFC. The main purpose of the GNCFC is to ensure the allocation of an adequate number of import licences for the importation of outboard motors and fishing gear. The GNCFC negotiates with the government for improvements and changes deemed necessary by the fishermen themselves. It is hoped that the GNCFC will provide the canoe fishing with new technological inputs and that innovations would spread through the members of the GNCFC. ²⁰

Nii Abeo Kyerekuanda subscribes, as many fishermen do, to the myth of a 'just passed golden age'. It is said that young fishermen of today know less of weather conditions and aspects of the moon and stars used for forecasting fish, and navigational skills along with general canoe seamanship than their fathers did. New innovations in fishing technology have taken the interest of young fishermen who are now reluctant to go to sea in a vessel which has not got an outboard motor. For many of today's young men, paddling is passe.

There is also the National Fishermen's Association, to which all the fishing organisations belong. The NFA's objective is to promote, develop and protect the fishermen and the industry of fishing in Ghana.

The Fisheries Research Unit within the Ministry of Agriculture's Department of Fisheries monitors

environmental changes and fish stocks. The FRU has a technical division which investigates the current fishing gear used by the industrial fisheries and the artisanal sector with a view to general improvement. The Department of Fisheries benefits from technical and financial assistance from a variety of international organisations.

5:6 Canoe Models

There is no substitute for a field study on Ghanaian canoes but models can offer a different perspective. Model boats have many roles; they allow us to see how boats were made at the time the model was built as many were copies of working craft of their day. They have an educational value not simply for us as an historical artifact, but also to the people who made them. In Ghana the training of future fishermen begins with the games played by the children of canoe fishermen. Many of the young boys own model canoe carved either by their fathers or themselves. The designs and names on the more elaborate models often emulate the canoe that the father or relatives own or work on as crew members. These canoes are often intricately carved with thwarts, mast and sail along with miniature paddles, nets and wooden outboard motors. These model canoes are used in tide pools by children as they enact their father's work. Fishermen consider this an important stage in the apprenticeship of young fishermen. ²¹

Historically models are believed to have been used as templates for canoe builders in the forest. ²² According to Smith, during pre-colonial times when the canoe carvers lived and worked away from the coast in the forest, the specialist canoe carvers

were either visited by their client or sent children's models to work from as makers' models. Brown also noticed that some time after the second half of the nineteenth century the forest receded too far away from the coastline for fishermen to carve their own canoes. The fishermen took their children's models to the bush to act as specifications for the builders. He believed that "it was in this way that people remote from the sea learned to make these fine sea boats".²³ He also remarks that in 1947 models for this purpose had been dispensed with. This suggested use for models seems a little tenuous, as canoe carvers are reputed to have their origins at coastal fishing villages, and followed the forest as available tree supplies have moved further up country. But today many fishermen still attest to this use of model canoes in previous times.²⁴

Carvers still present good clients with models of their canoe, which would be carved by the canoe carvers in their leisure time or when work on the real canoe was not possible.²⁵ Chief fishermen often have a small model of a canoe, for use as a 'linguist staff'; the canoe forms part of the chief's ceremonial regalia. It is placed before the chief and he communicates his wishes indirectly through the canoe. This device is common in Ghana and the 'linguist staff' can take different forms; usually however it reflects the field in which the holder has authority, i.e. chiefs of farming communities may have a model tree or animal.²⁶

Canoe models have also been favoured by European people visiting coastal areas, and possibly models have been carved by both fishermen and canoe carvers as tourist souvenirs. There are very few

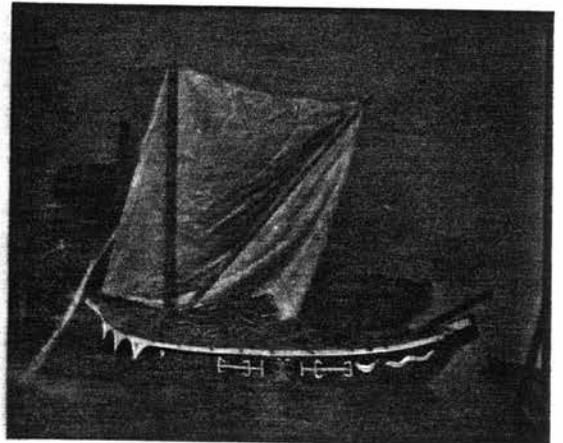
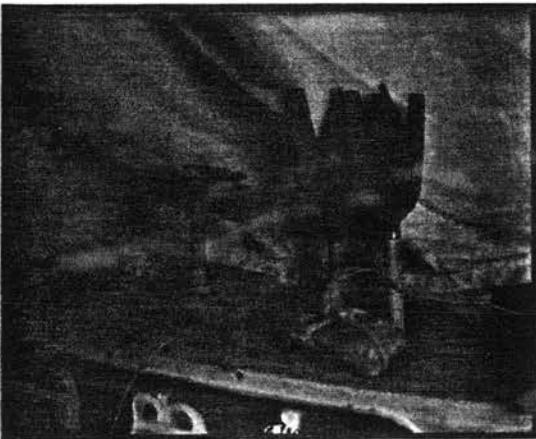
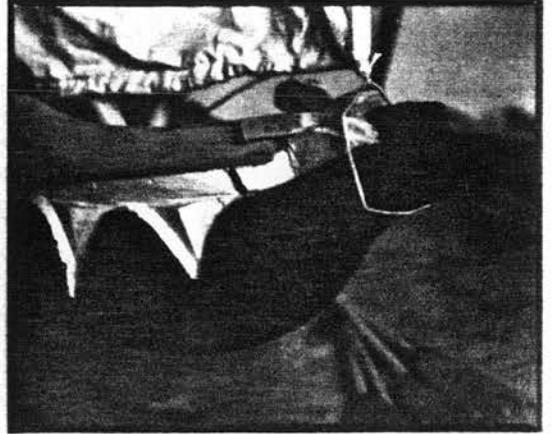
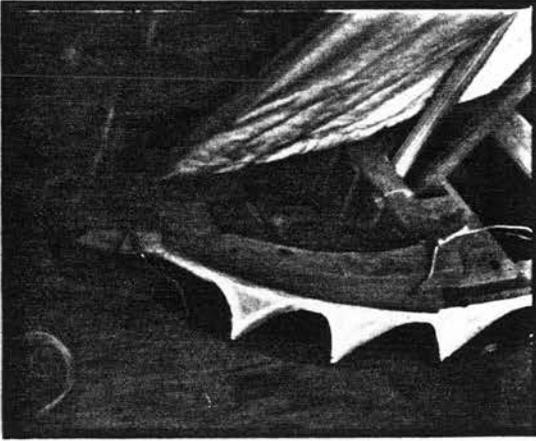
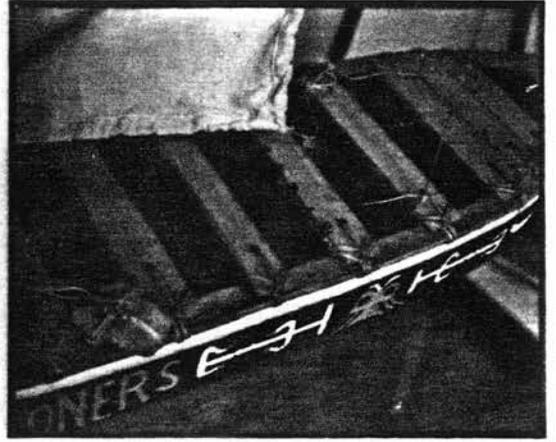
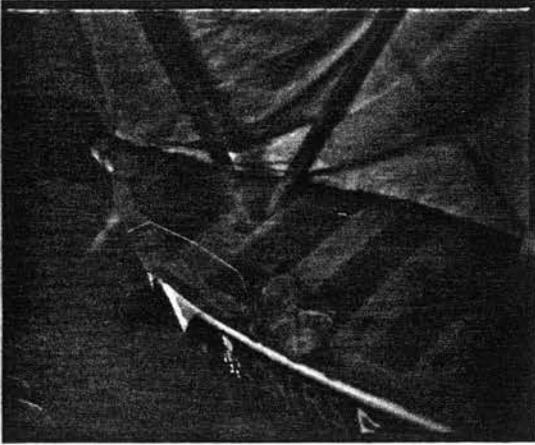


fig. 70

made for this purpose today. A considerable number have found their way into maritime museum model collections ²⁷. One of the Ghanaian model canoes in the Exeter Maritime Museum collection (fig 70) is a splendid example of a complete fishing canoe from the 1950's. The model had been carved to the dugout stage with thwarts lashed to the gunwales and an interesting feature, now lost on the real canoes, is the internally carved hocks against which the steering oarsman braced his feet. The mast step has also been carved as an integral part of the dugout giving extra strength under the mast. This model has carved decoration, probably representing that of a working canoe at the time the model was made, and is complete with a buoyed and weighted net with a rattle board attached to one end. The canoe is rigged with mast spars and sail along with six paddles, a steering oar and a stone anchor.

The contemporary example of a canoe model featured in fig 71 was built by a fisherman for his son to play with. Although not as decorative as the Exeter model, it has been constructed and repaired in the same way as a working canoe. The model has been charred to drive out wood boring insects, and gaps between the dugout and the planking have been caulked with nylon sacking poked and melted into the gaps by igniting a little petrol. Thwarts have been nailed to the gunwales and a cane rubbing strake has been added. This model has the name 'Kotoka' scratched into both sides of the dugout, after the name of Ghana's international airport. The underside of the canoe has a good rocker which has been scuffed where children have dragged it across earth. A thin layer of cobalt blue paint has found its way onto the port and starboard sides

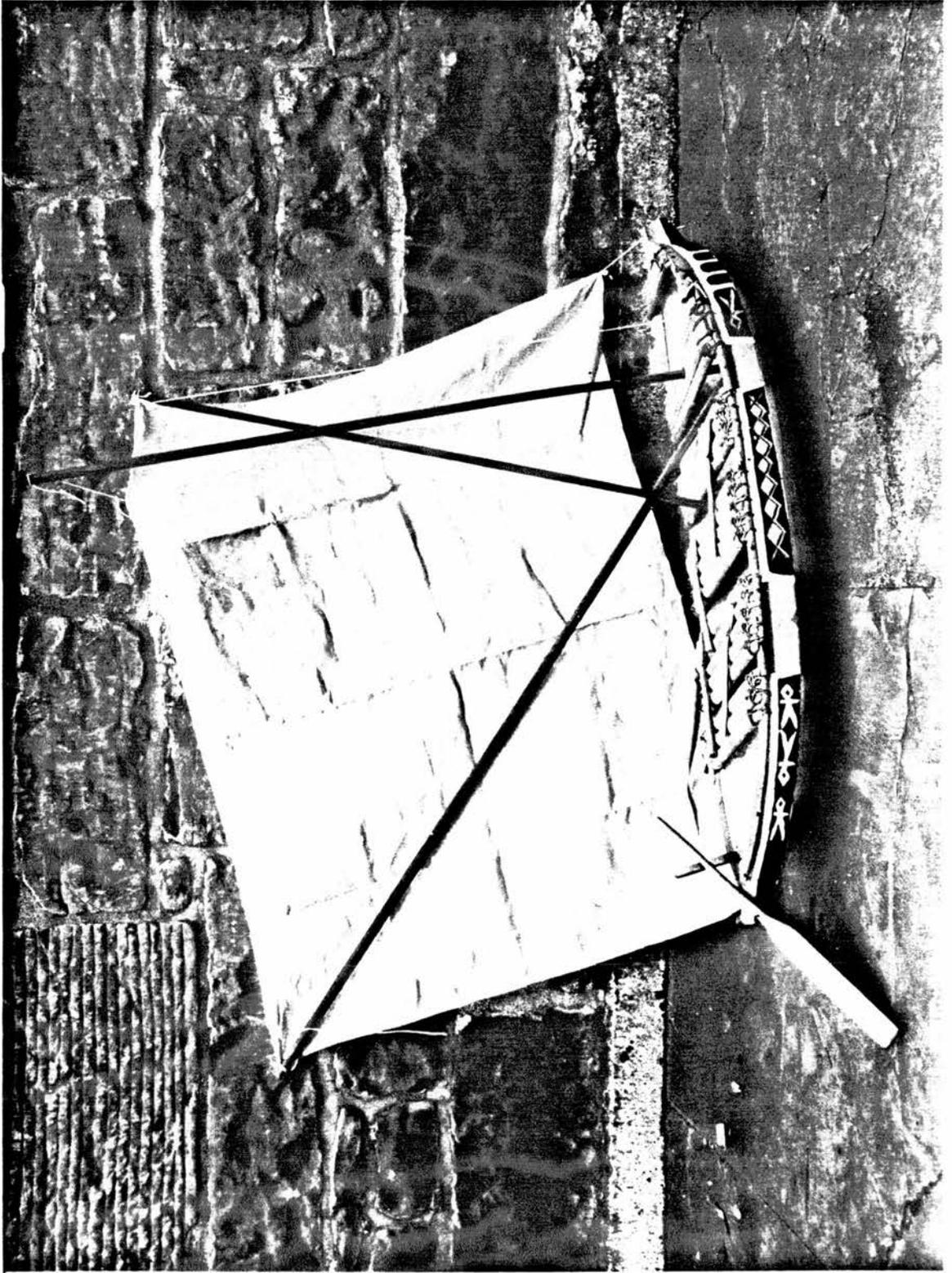


fig. 72

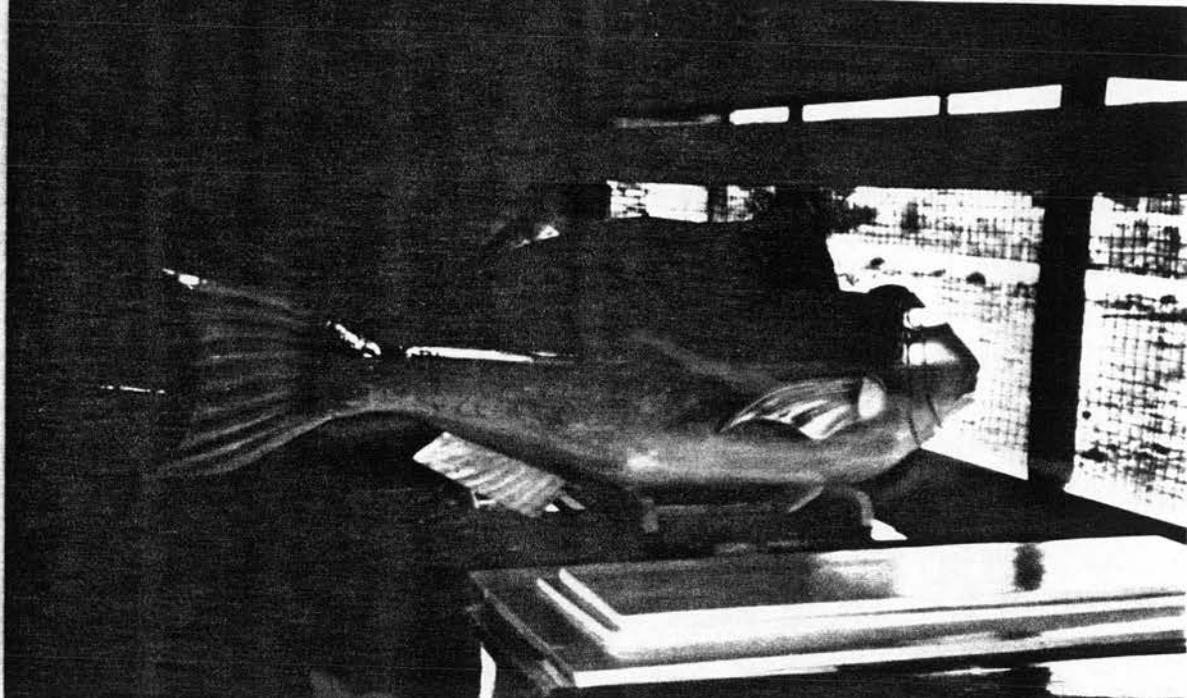
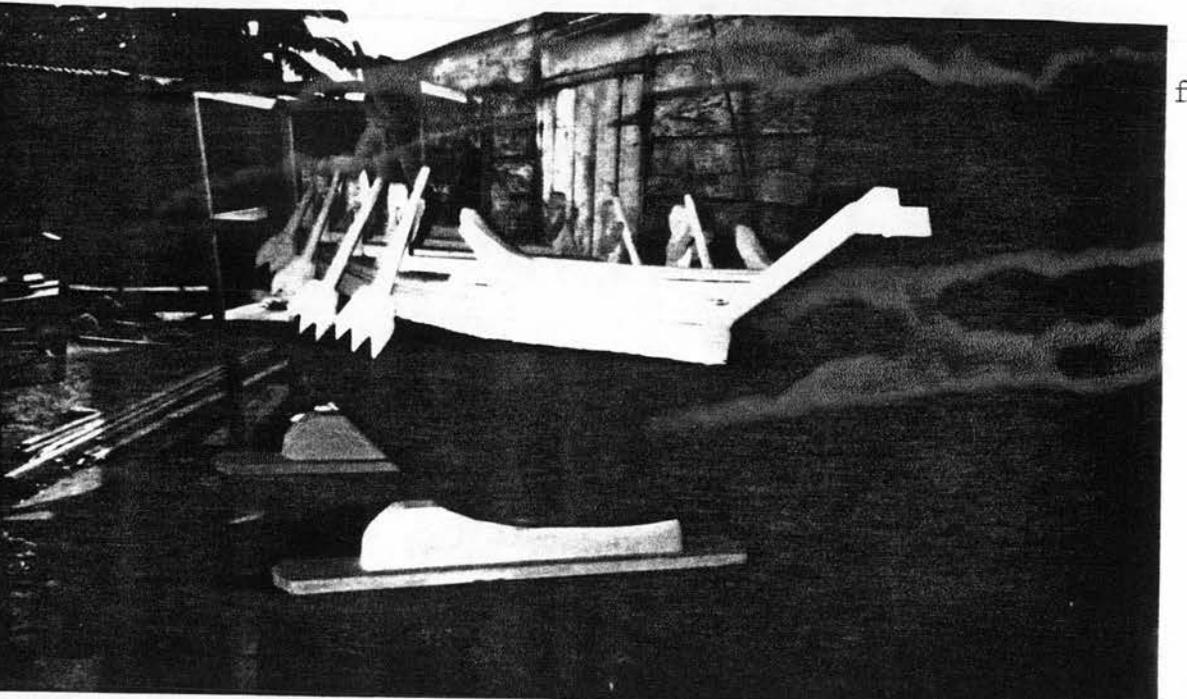


fig. 73



fig. 74



of the model.

5:7 Canoe Coffins

The canoe is a very focal point in the canoe fisherman's life, so much so that when he passes on into the next world he may travel in a canoe shaped coffin. In Ghana there has been a tradition for important fishermen to be laid in a small canoe (similar to those young boys learn to go to sea in) as the fisherman is sent for one final trip to sea as part of the funeral ceremony, before being buried on land in a regular coffin.

The idea for 'fantasy coffins' was conceived in the 1970's by Kane Kwei, an enterprising carpenter in the coastal village of Teshi, a suburb of Accra. Kane turned his skills to accommodate the desire of his dying uncle, the local chief fisherman. Kane's uncle requested that a coffin shaped canoe, modelled on his own canoe, be made as he hoped to continue fishing in the next world. At the fisherman's funeral the canoe coffin created a great deal of excitement and approval. The carpenter began to receive orders for other sculptured coffins whose shapes were dictated by the intended occupier's trade or related lifestyle.

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There are various extravagant and whimsical coffin shapes: exotic fish (fig 72), brightly coloured with car spray paints to be occupied by wealthy fish mummies, cocoa pods for cocoa farmers, Mercedes cars, aeroplanes, houses and an assortment of animals (fig 73). All are made to order, often by the eventual occupier, who may wish to display the coffin in their home before death occurs. Alternatively instructions are left with the

relatives on the type of coffin they wish to be buried in. The coffins are made from cut Wawa timber and local carpentry hand tools are used in the construction. Several carpentry workshops have set up since the 1970's around the Teshi district, exclusively producing fantasy coffins.

The canoe shaped coffin (fig 74) which I observed under construction had an overall length of 2.80 cm, width 50 cm and depth of 50 cm. The hull of the canoe coffin is painted and decorated in the same designs as those on the landing beaches around Teshi. The occupier's name is either carved or painted along the sides of the coffin, along with a proverb or the name of the fisherman's own canoe. The interior is lined with cloth and the coffin sits on two wooden stands which enable four coffin bearers to carry it through the funeral ceremony. The price for the completed canoe coffin, including carved figures with paddles and a steering oarsman at the stern, will cost about c200,000; a large sum of money by any trader's standards.

If the fisherman were unable to afford a canoe shaped coffin he could order a small model (fig 75) which would be placed on top of a plain coffin during the funeral ceremony to denote his trade. After the burial this model would be taken back to his family home and displayed in the same way as an ancestor doll is, as a medium for worshipping spirits.

CONCLUSION

Traditional fisheries throughout the world have a role of tremendous value. In Ghana, as in many developing countries, traditional fishermen contribute an important amount to the food supply, particularly as it is a renewable food source at a time when there is a Third World food crisis, drought, inflation and population increase. It also provides much secondary economic activity by furnishing orders for canoes and gear. An entire service industry is dependent on their labours, from distribution to capital financing. Canoe fisheries along the West African coast have become increasingly important both for food and employment. The Ghanaian canoe is the vehicle by which access is gained to this food resource. It is perhaps not surprising therefore to find that Ghanaian fishermen have a preference for bigger canoes, for with these canoes the fishermen can use large gear, catch more fish and therefore make more money to sustain the chain of people attached to the fishing communities.

I had intended to concentrate my research solely on the canoe construction process. However, I became increasingly aware that this was merely the weft in a much greater tapestry. To the Ghanaian people the canoe is not just a boat to catch fish with; it is their history, a focal point in their lives; children grow up with them as models for toys, fathers become canoe fishermen and mothers sell or cure the fish. The canoe provides continuity and encompasses the hopes of much of their lives. The beached canoe acts as meeting place and work place.

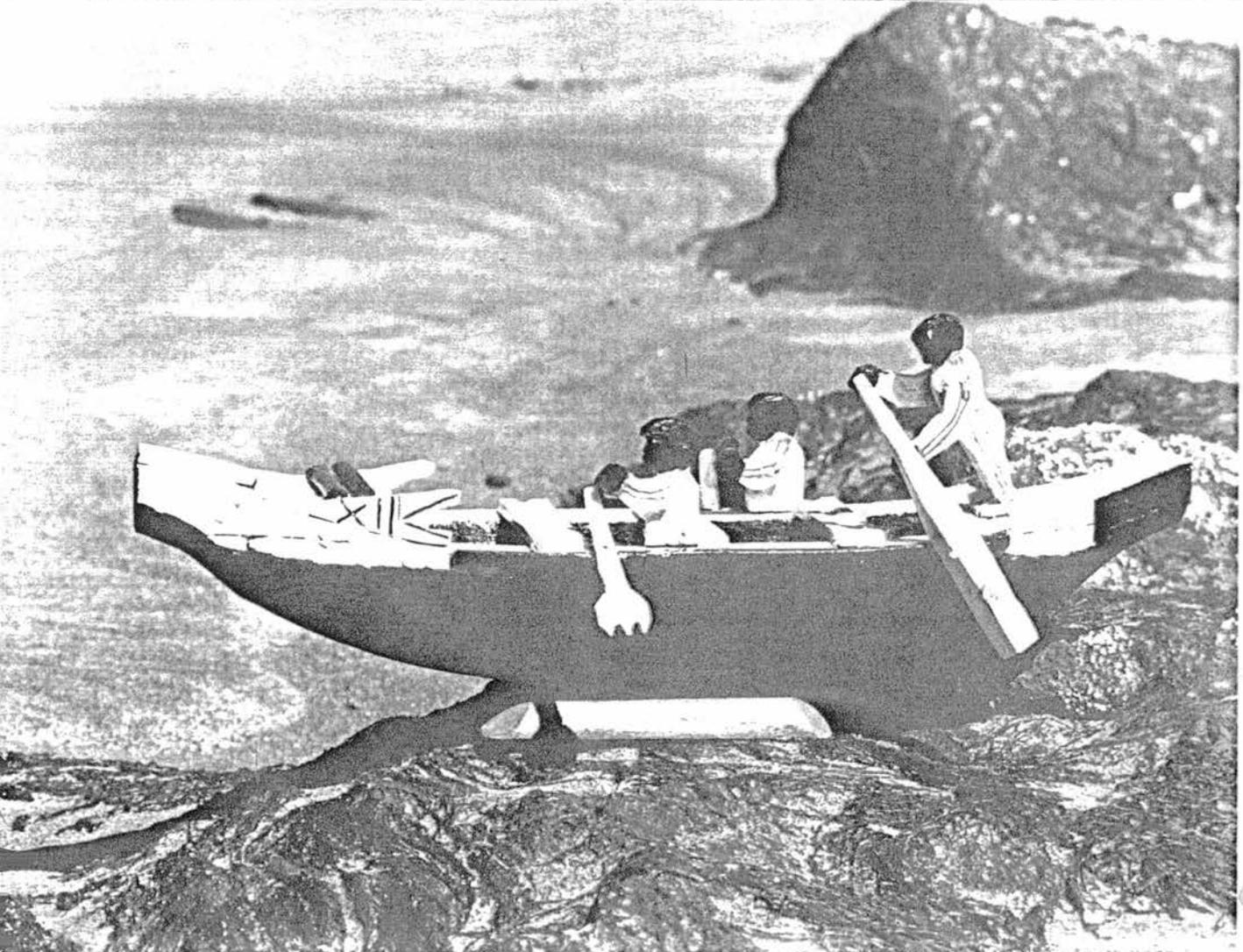
The canoe is not simply a boat but a concept which permeates many facets of the fishing community's life, including the aesthetic and the sacred. The economic and social importance of the canoe cannot be disputed, but the future of the large canoe looks bleak. Replacements for

the current large dugouts can only be guaranteed for 10 to 20 years, given the remaining number of trees.

In terms of conservation some 4,000 large canoes will need replacing over the next ten years in Ghana alone, not taking into account the number of canoes built in Ghana and exported along the West African coast (a further 2,400). There are not sufficient numbers of trees growing today and such trees need to be over 80 years old before they can be used. FAO replanting programmes cannot begin to produce suitable material for the future, and timber merchants have already been granted timber concession to fell trees of all ages, with the popular diameter being 70 cm plus. This means that few trees will ever reach maturity in Ghana again. The inexorable drain on the forest reserves will soon catch up with canoe construction and there are already manifest problems locating large Wawa.

The Fisheries Division of the Food and Agriculture Organisation of the United Nations is concerned about the future of Ghana's small-scale fisheries who are dependent on forest resources to build their vessels. The Fisheries Division has taken the responsibility of commissioning research into the potential problems and arranged a workshop as a forum for publicising the difficulties now being experienced by the canoe fishermen and canoe builders to a wide audience, along with drawing the attention of the Ghanaian Government to the plight of the canoe fishing fleet. The workshop which took place at the end of November 1990 was to include discussion on: fishing craft development and improvement, depletion of forest resources and its implications for boat construction, and improvements and innovation in fishing technology related to replacement of artisanal craft. The proceedings and outcome from the workshop will be published by FAO in the near future. Many people may see no real problems in developing alternative craft. But this is not the case in Ghana as the majority of large canoes work from open

beaches going through a surf zone and working from a rocky coastline with many beaches now eroded back to bedrock. These conditions necessitate a vessel of great sturdiness, which of course only the large dugout provides at an economic price. Also the fishing communities are spread along the entire coast and it would be impossible to move the entire fishing population into harbours required by other craft. The Ghanaian fishermen have an intimate knowledge of their marine environment which enables them to adapt readily to changes in fishing conditions. As the major fish species vary in abundance according to seasonal change, the canoe fishermen switch their fishing skills and techniques easily to suit the fishing activities. If artisanal fishing is to continue to succeed along the Ghanaian coast, new ideas must first gain the acceptance of Ghanaian fishermen; it is they who have proved the guinea pigs for new technology and ideas implemented in Ghana soon spread to other countries. If it is actually possible to introduce another boat which will withstand the geographical conditions and be within the skills and economic means of local people, it should be introduced soon, for any hiatus in the availability of such a craft could see the demise of an entire way of life for thousands of people. It may already be too late...





NOTES

INTRODUCTION

1. MILLETT, M & McGrail, S. 1989 / Hasholme Boat. This logboat is of comparable size to the large dugout canoes presently under construction in Ghana. THE ARCHAEOLOGY JOURNAL VOL. 144, PG. 69 - 155.
2. Binford, L. 1983 In Pursuit of the Past, London.
3. Greenhill, B. 1976 Archaeology of the Boat, A & C Black, London.
4. There are several ethnographical descriptions of logboat construction from a wide range of countries recorded this century. Such accounts are useful comparative study to those still under construction in West Africa, for example:
Best, E. 1925 The Mauri Canoe, Dominion Museum, New Zealand.
Hornell, J. 1948 Making and Spreading of Dugout Canoes, Mariners Mirror Vol. 34 No. 1.
Leshikar, M. Construction of a Dugout Canoe, Jamaica. Proceedings of the 16th Conference on Underwater Archaeology, No. 4 Ed. P. Johnston.
McGrail, S. (Ed.) 1977 Sources and Techniques in Boat Archaeology BAR 29.

CHAPTER 1

1. Kpordugbe, P. 1984 Release of the National Service Scheme: Information about Ghana. 3. (a)
2. Geographical information is taken from both:
Boateng, E. 1959 A Geography of Ghana, Cambridge University Press, and
Kudo, R. 1978 A Comprehensive Geography of West Africa, London.
3. UNICEF 1986 Release on General Characteristics of Ghana.
4. FAO 1984 Abstract Report. 2.1.
5. As Robert Smith noted in his article 'The Canoe in West African History' 1970, Journal of African History Vol. XI, 'The Ethnographical Department of the National Museum of Denmark, Copenhagen, has in room 65 a boat collected apparently early in the 19th century on the Gold Coast. According to the catalogue - The boat, the middle part of which is missing, is equipped with paddles, mast and mat sail'. pg. 516.

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CHAPTER 1 (continued)

6. Pieter de Marees 1605 Description et Recit Historical du Riche Royaume d'Ore de Gunea, Amsterdam. (This is a key source for early material) on 17th century fishing).
7. Fage, J. 1959 Ghana, An Historical Interpretation, University of Winconsin Press.
8. Barbot, J. 1732 A Description of the Coasts of North and South Guinea, London. (Barbot made his final voyage to Africa in 1682). pg. 149-150, 157, 266.
9. Dickson, K. 1969 An Historical Geography of Ghana, Cambridge University Press. pg. 46-47.
10. Wilson, L. 1856 Western Africa, London. pg. 148-151
11. Smith, R. 1970 The Canoe in West African History, Journal of African History, Vol. XI. pg. 532
12. Meredith, H. 1812 An Account of the Gold Coast of Africa, London. pg. 22
13. Burton, R. & Cameron, V. 1883 To the Gold Coast for Gold, Vol. II, London. pg. 84.
14. Hutton, W. 1821 Voyage to Africa, London.
15. Extracted from the dialogue to the film 'Surf Boats of Accra' produced by Unilever 1959.

CHAPTER 2

1. 1984 Population Census of Ghana.
2. Vercrijse, E. 1984 The Penetration of Capitalism; A West African Case Study, London. pg. 5
3. World of Information 1989 The Africa Review 'Ghana' 13th Edition, London.
4. Akersie, W. 1986 Preliminary Analysis of Canoe Frame Survey, Accra. pg. 3
5. White, T. 1989 Terminal Report, MacAlister Elliott & Partners. Although the fishing sectors co-exist, there is friction between them as stated in White's report - 'Larger 40 - 60 metre local and joint venture trawlers are commonly observed operating as close as 1 kilometre offshore all

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CHAPTER 2 (continued)

along the coast, where they come into conflict with smaller inshore trawlers and the canoe fleets operating gill nets and purse seine gears. The larger vessels regularly damage or destroy these gears and certainly compete for the inshore fish stocks. There appears to be little serious attempt, or at least success, at keeping these sectors apart'. p 16

6. The following information was taken from two sources: FAO 1984 Catalogue of Small-Scale Fishing Gear of Ghana^{2.1-2.1.4} and FAO 1989 Sector Study - Ghana - Fisheries Sector Review. 3.14
7. Brown, A. 1947 The Fishing Industry of the Labadi District, Crown Agents, London. p 26
8. Dickson, K. 1969 An Historical Geography of Ghana, Cambridge University Press. p 317
9. Ibid. p 316
10. Vercruijse, E. 1984 The Penetration of Capitalism: A West African Case Study, London. p 124-126
11. This figure is stated in the FAO 1989 Sector Study - Ghana - Fisheries Sector Review. 3.39
12. Vercruijse, E. 1984 The Penetration of Capitalism: A West African Case Study, London. p 112
13. Ibid.
14. This information was taken from Vercruijse, E. 1984 The Penetration of Capitalism: A West African Case Study, London, ^{p 28-29, 37-38} and confirmed by a personal communication with the Executive Secretary, Nii Abeo Kyerekuana of the GNCFC, Accra.
15. Vercruijse, E. 1984 The Penetration of Capitalism: A West African Case Study, London, and personal communication with the chief fisherman, Nii Okuso of Sempe Asere, James Town.
16. Ibid.
17. Personal communication with John Debrah of the Agricultural Development Bank.
18. Vercruijse, E. 1984 The Penetration of Capitalism: A West African Case Study, London. p 34

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19. Ibid.
20. Hill, P. 1970 Studies in Rural Capitalism in West Africa, Cambridge University Press. p 51-52
21. Brown, A. 1947 The Fishing Industry of the Labadi District, Crown Agents, London. p 45-46
22. Board on Science & Technology for International Development, 1988 Fisheries Technologies for Developing Countries, National Academy Press, Washington. p 147-149
23. Brownell, B. 1983 Improved Fish Smoking in West Africa, UICEF Publications, New York. p 23
24. Vercrijse, E. 1984 The Penetration of Capitalism: A West African Case Study, London. p 56-68
25. Ibid.

CHAPTER 3

1. Personal communication with Jenny Wong, ODA Forestry Commission, Kumasi.
2. Personal communication with Nii Abeo Kyerekuanda of GNCFC, Accra; similar information was given to Ned Coakley in his FAO IDAF TRAM 28 report.
3. The following information is taken from discussion with the K.K. canoe carving company, whom I accompanied to their site of work in the Ashanti region.
4. The properties of Triplochiton Scleroxylon are taken from the Handbook of Hardwoods HMSO 1972 and Rundle, B. 1959 World Woods, London. p 150-152
5. Personal communication with Robert Bamfo, Forestry Commission, Accra.
6. As corroborated by the K.K. chainsaw operator and a local timber merchant.
7. Personal communication with Daniel Abbiw, Botany Department, Legon University.
8. Personal communication with Nii Abeo Kyerekuanda of GNCFC, Accra.

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CHAPTER 3 (continued)

9. Personal communication with John Debrah of the Agricultural Development Bank.
10. 'The estimated age of the trees used for the construction of seagoing canoes is between one hundred and one hundred and fifty years old'. Personal communication with Jenny Wong, ODA Forestry Commission, Kumasi.
11. Personal communication with Jeremy Turner, Fishery Industries Division of the Food & Agriculture Organisation of the United Nations, Rome.
12. Ibid.
13. Coackley, N. 1986 FAO IDAF TRAM 28 Report. p 8
14. Personal communication with Jenny Wong, ODA Forestry Commission, Kumasi.
15. Coackley, N. 1986 FAO IDAF TRAM 28 Report. p 10
16. Laryea, H. & Mensah, M. 1984 Study on the Ghanaian Dugout Canoe and its Prospects for Utilisation in other West African Countries, Accra. p 22-23
17. Transport of dugout canoes from forest regions to the coast by river systems is historically cited: Smith, R. 1970 The Canoe in West African History, Journal of African History Vol. XI. The master carver of the K.K. Company recalled the practice of floating canoes down rivers in the Western region when he was a young man.

CHAPTER 4

1. This information was gained from observation and discussion with carpenters in both James Town and Elmina.
2. Brown, A. 1947 The Fishing Industry of the Labadi District, Crown Agents, London. p 38
3. The use of fire as a method to reduce the log in the construction of Ghanaian seagoing canoes made from Wawa has not to my knowledge been recorded. Probably because the texture of Wawa is brittle and difficult to burn. However, abandoned canoes which have been stripped of any re-usable canoe building material are chopped up into bundles to be sold as

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CHAPTER 4 (continued)

firewood in areas where better burning materials are scarce.

4. Brown, A. 1947 The Fishing Industry of the Labadi District, Crown Agents, London. p³⁸⁻⁴⁰
5. Personal communication with Gordon Sheves, FAO/IDAF Program. 'While the canoes are given greater capacity with higher freeboard the addition of planking does not significantly increase their beam. To do so would seriously impair their stability. Considering that a Wawa tree of the required growth can be up to 61 metres high, fishermen and canoe builders when asked why canoes were not made longer, which would give greater stability, gave two reasons - one, that a longer canoe was difficult to steer and two, that long canoes can crack when being beached on rollers. The first reason is self-evident, and also foresters and sawmillers confirmed that the longitudinal strength of Wawa is limited due to its short fibres'.

Given the above information, together with discussion I had with fishermen about why canoes were not made longer - 'Canoes had been made longer in the past, but they broke in half between waves' - this indicates that the present large canoe has reached a limit in its development.

6. The height of planking varies between the types of landing beach of sheltered harbour from which the canoe operates. Canoes working from the relative shelter of Elmina harbour appear to be planked up to a greater height than canoes of the same length or longer which operate from a surf beach such as Ankaful.
7. 'In past times, the thwarts or seats were made from sticks of Honhon (*Antiaris africana*) which were lashed with palm raffia; now modern fishermen use split boards of Wawa or Odum. Holes used to be bored along the gunwales of the dugout canoe with a carpenter's brace and bit and the hole was finished with a long crude awl, locally known as 'fitsii' which is an iron rod fixed to a long stick, first put into the fire which is made on the ground. The hot awl is then pushed into the hole to burn the sides of the hole to give the drilled hole fine, clean sides. Cane strands are used when all the holes have been drilled and cleaned and all the thwarts are cut to size. The canoe strands are

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CHAPTER 4 (continued)

- used to lash the seats on top of the canoe sides; each seat is eight to fourteen sticks wide. European twine is also used'. Student thesis on Canoe Fishing, 1963 UST Fine Art Department, Kumasi.
8. Personal communication with a number of carpenters working on canoes at James Town.
 9. Personal communication with a decorative carver operating at James Town, his work explained to me by Nii Abeo Kyerekuanda.
 10. The Ghana National Museum has in its collection, drawn examples of canoe motifs from the 1930's and several decorated gunwales removed from abandoned canoes in the 1960's. The museum also has a good selection of symbols used in Ghanaian culture and their interpretation.
 11. Coronel, M. 1979 Fanti Canoe Decoration, African Arts, Vol. XIII, 11. p 54-59
 12. Bow decoration is occasionally seen in the form of a painted fish. The image of Christ is sometimes painted on the outside of the canoe at the bow, above the waterline.
 13. The significance of the carved motifs are described in Coronel, M. 1979 Fanti Canoe Decoration, (p 54-59) African Arts Vol. XIII, 11, and from discussion with canoe fishermen along the coast of Ghana.

CHAPTER 5

1. Personal communication with the chainsaw operator of the K.K. canoe carving company. (A more comprehensive account of the rituals surrounding the felling of trees and spirits which inhabit the tree is given in Rattray, R. 1927 Religion and Art in Ashanti, Oxford University Press).
2. The crew members of 'Phobia' explained the canoe naming ceremony carried out on canoes they operate at Mile 16.
3. A small package of herbs can be seen tied to the bow of a model Ghanaian canoe in the Exeter Maritime Museum collection.

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CHAPTER 5 (continued)

4. The rituals surrounding the naming of a new canoe were explained to me by Nii Abeo Kyerekuanda.
5. Personal communication with carpenters at James Town, although some effort is made to correct any degree of list on a new canoe by shaving the volume of wood on the lower side of the canoe.
6. Vercrijse, E. 1984 The Penetration of Capitalism: A West African Case Study, London. p 69-70
7. Jan Olof Traung 1967 Fishing Boats of the World No. 3, Fishing News Books, London. p 334-344
8. Personal communication with Preben Holler, FAO Fishing Technologist, IDAF.
9. When the canoe is not in use, the fishermen remove the outboard motor and store it for security reasons.
10. Anonymous 1963 Student Thesis 'Canoe Fishing' UST Fine Art Department, Kumasi.
Bidault, J. 1945 Pirogues et Pagaies, Paris.
11. Abbiw, D. 1989 Useful Plants of Ghana, IT Publications, London. p 109
12. This figure is generally estimated by fishermen, Fisheries Officers and confirmed in a personal communication with Gordon Sheves, Fisheries Development Advisor.
13. This information was gained from discussion with a number of fishermen and observations of canoes capsizing at Labadi and Saltpond.
14. Identification of the Teredo damage to canoes in personal photographs was carried out by the Zoology Department of the National Museum of Wales.
15. Lane, C. 1961 The Teredo, Scientific America No. 204. p 132
16. Laryea and Mensah note in their study on the Ghanaian dugout: 'A well kept canoe made from good quality Wawa could be seaworthy for about thirty years'. This statement was confirmed by their observation in the Gambia where Ghana made canoes imported into the country in the early 1960's were still being used in 1984. p 24

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CHAPTER 5 (continued)

17. Personal communication with Nii Abeo Kyerekuanda, GNCFC, Accra.
18. Brown, A. 1947 The Fishing Industry of the Labadi District, Crown Agents, London. p 28-29
19. Coronel, M. 1979 Fanti Canoe Decoration, African Arts, Vol. XIII, No. 11. p 55
20. Personal communication with Nii Abeo Kyerekuanda, GNCFC, Accra.
21. Coronel, M. 1979 Fanti Canoe Decoration, African Arts, Vol. XIII, No. 11. p 55
22. Brown, A. 1947 The Fishing Industry of the Labadi District, Crown Agents, London. p 24
23. Smith, R. 1970 The Canoe in West African History, Journal of African History, Vol. XI. p 520
24. Personal communication with chief fisherman, Nii Okuso Sempe Asere, James Town.
25. Personal communication with the carvers in the K.K. Company.
26. Arkorful, K. 1973 National Museum Handbook, Ghana Publishing. p 46
27. Amongst the models of Ghanaian canoes held in museum collections are the builders' models of surf boats (two of which are held in the Liverpool Maritime Museum; Accession numbers 57-79 and 659). The builder's models represent the surf boats which were used prior to the construction of harbours to transport cargo between surf ports and waiting ships. The surf boats were of European design, plank built and rowed by the canoe fishermen of Cape Coast and Central Accra. The Unilever film 'Surf Boats of Accra' showed the surf boats in operation.
28. Burns, V. 1974 Travel to Heaven; Fantasy Coffins, African Arts, Vol. VIII, No. 2. p 25

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