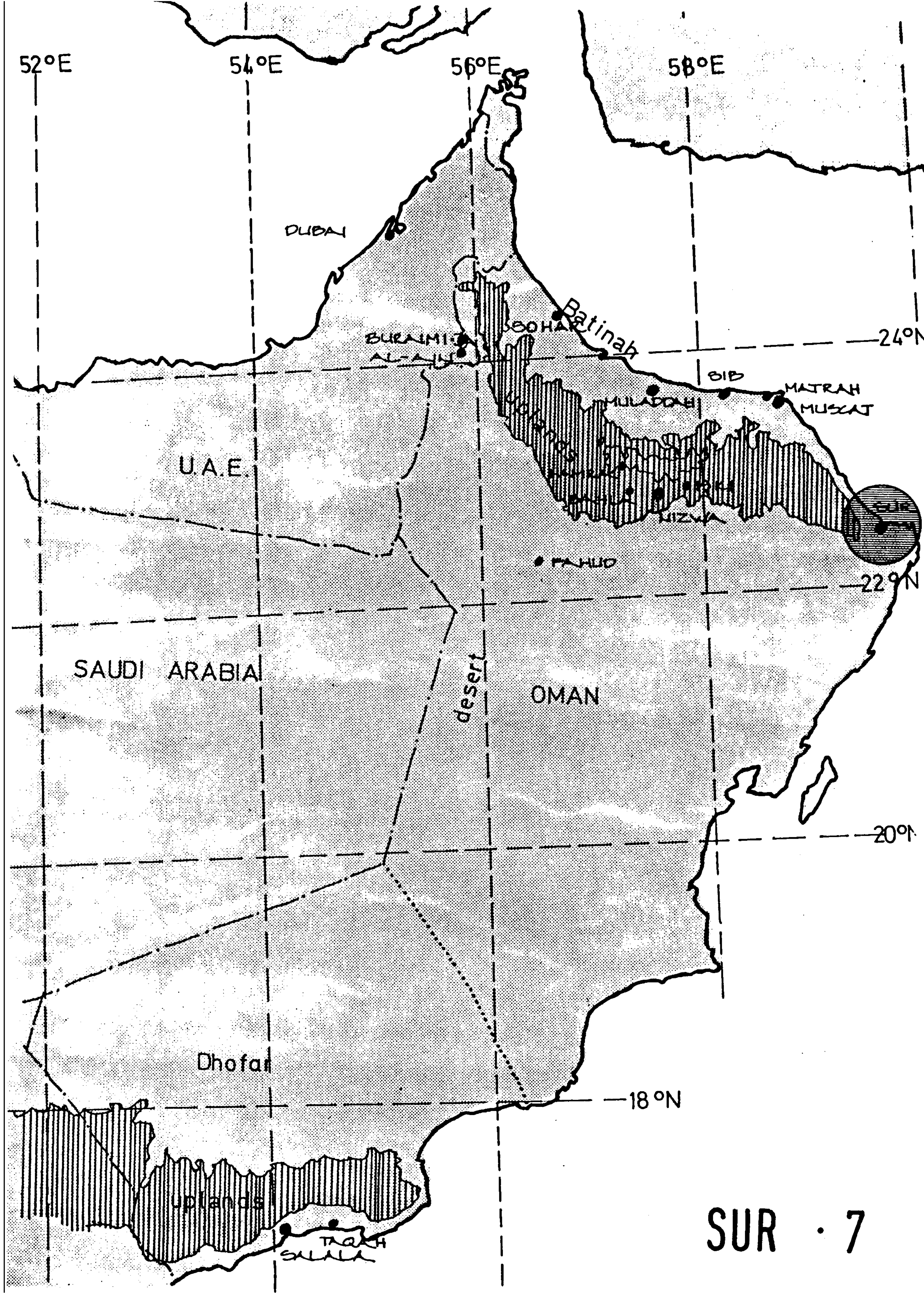

52°E
54°E
56°E
58°E
DUBAI
BURAIMI
AL-AIN
SOHAR
Batinah
24°N
SIB
MATRAH
MUSCAT
MULADDAH
NIZWA
SUR
FAHUD
22°N
U.A.E.
SAUDI ARABIA
desert
OMAN
20°N
Dhofar
18°N
uplands
TAQAH
SALALA

SUR · 7


Qalhāt
Jawzah
J. Hulayyāt
W. Birka
W. Hāfir
Bi'r Birā'
Khawr
Ghāmah
Shurayjah
4
5
6
7
799
Gravel
Sunaysilah
SŪR
Ra's Sharh
Āyqā
Towers
Ābāt
Bilād as Sūr
Blud
R o c k y
Fitā'
Trees
Maslāq
Taymā'
Rafṣah
W. Rafṣah
RIFAH (T.)
W. Umm al Lakhm
.244
R o c k y
250±
891
Fulayj
W. Fulayj
G r a v e l p l a i n
450±
S a n d
a n d g r a
290±
JABAL KHAMIS
.951
Silsil
Wādī
Yu'ayy
.510±
210±
.850±
1050±
.620±
G r a v e l h i l l s

7. SUR

7.1 Introduction

7.1.1 Physical

Sur is strategically located on Oman's coast in an important trading position, at the southern tip of the mountains which run through central northern Oman, and is the terminus for trading routes which stretch across the desert extending into Dhofar. Sur is near the point where the Oman Gulf opens into the Indian Ocean (Fig 71).

Sur proper, Ayqa and Bilad as Sur, form an economic unit. Bilad as Sur is basically an agricultural town, being an oasis-like area a few kilometres south west of Sur, while Sur, the market and trading centre, is located on the coast but surrounded almost completely by water or tidal flats. Ayqa is a smaller settlement, an extension of Sur proper and lies on the point of land across the narrow straits east of Sur. Communications are maintained by ferry.

The town of Sur lies on a peninsula with the Gulf of Oman to the north and is except for a land link to the west, almost completely surrounded by a lagoon like bay. The coast on the 'Gulf' and the 'Bay' side is unstable and much of the apparently dry land is seasonally covered by water. The town of Sur is densely built up, and almost all permanently dry land, outside of public open spaces, is built on up to at least one and two stories.

7.1.2 Economic and Social Introduction

Sur was and still is a port of call on the Dhow shipping route connecting Salala and the African coast to the south, with Muscat, the Gulf, Persia and India to the north and east. Sur even today shows signs of having been a great wooden ship building port.

Sur's importance as a trading centre in the past has resulted in a large community of Indian merchants and shop keepers. This merchant community probably has roots in the Sur area going back several generations, and today seems still to be the most prosperous sector of the society.

The inhabitants of Sur and the surrounding area in some cases have tribal connections with peoples of the interior, apparently even as far as Dhofar. Trade and economic connections therefore extend accordingly.

Sur no doubt became important as a trading centre, not only because of its strategic position but also because of its natural harbour. The sea is known to be rough in certain seasons and ships rounding the point at the extreme eastern end of the Arabian Peninsula would often find refuge at Sur. The water of the narrows flowing out of the sheltered bay behind Sur is navigable, but low tide in the bay often leaves ships high and dry.

Although Sur has an excellent natural harbour there are no sophisticated docking facilities (Fig 73). Ships or large boats which can not be beached must be loaded and unloaded using small boats, a somewhat labourious task.

With the lack of a docking area goods can not always be monitored but a customs house is located at the Sur side (western bank) of the narrows between Ayqa and Sur where goods are usually loaded and unloaded.

Fishing is another of the important sea-orientated industries of the area and is carried out primarily as a family activity by people living along the shore. Small boats can be drawn up on the beach adjacent to the house (Fig 72) when not in use. Fish are sold fresh in the market or dried and salted to be stored or sent inland or traded elsewhere. Dried fish or fish meal can be used as an agricultural fertilizer and no doubt is widely used in the planted areas of Bilad as Sur.

In general it can be seen that the economy of Sur has been in decline for some time. Unemployment is very high. Few local crafts and trades still flourish in Sur proper. Bilad as Sur on the otherhand still supplies staple foods to Sur but has in turn felt the effects of the decline in Sur's prosperity. Government building projects such as the school and hospital have provided some limited employment, but no long term industries have been established.

Local unemployment has resulted in the migration of workers to the Gulf region or to Saudia Arabia where employment is found in the oil industries and related construction projects. Only the working members of the family emmigrate. Wages are sent home to Sur, and it is this imported capital which is largely responsible for the maintenance of a reasonable economic level in Sur. Local workers in the Gulf do not see themselves as immigrants and have no plans for settling in the Gulf. They see their jobs as temporary and will return to live in Sur when they have accumulated enough money to live on or to establish themselves in a trade or shop. (For example, one man spoken to said that he had worked for an oil company in Saudia Arabia for a number of years and held a well paying job. When he had accumulated enought money he bought a car which he now runs as a taxi in Sur).

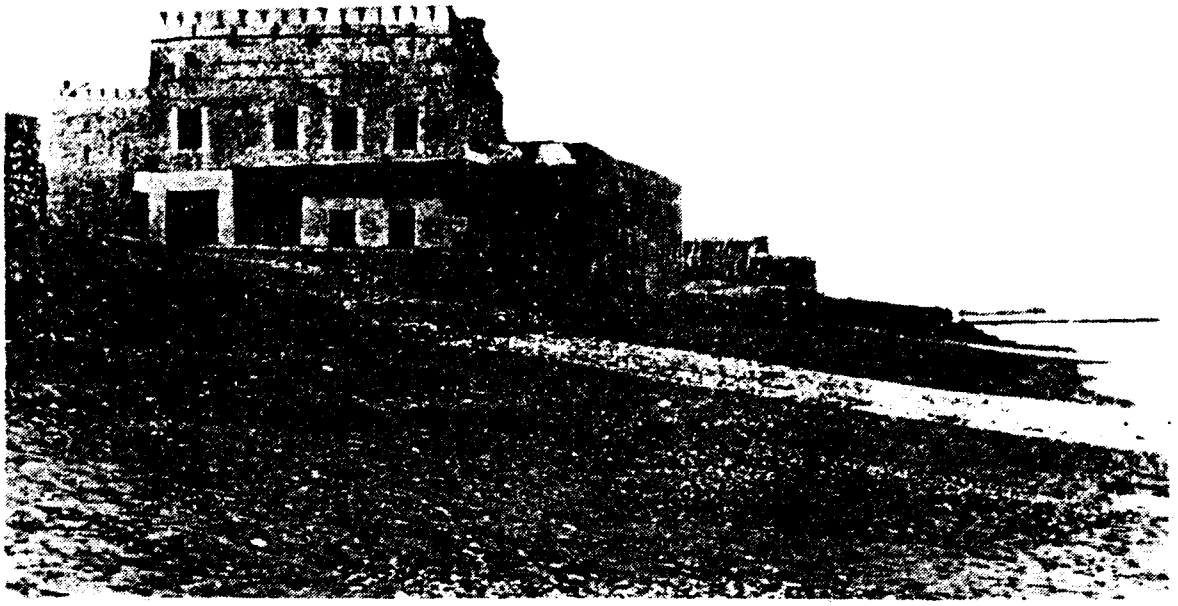


Fig. 702 House on Sur beach

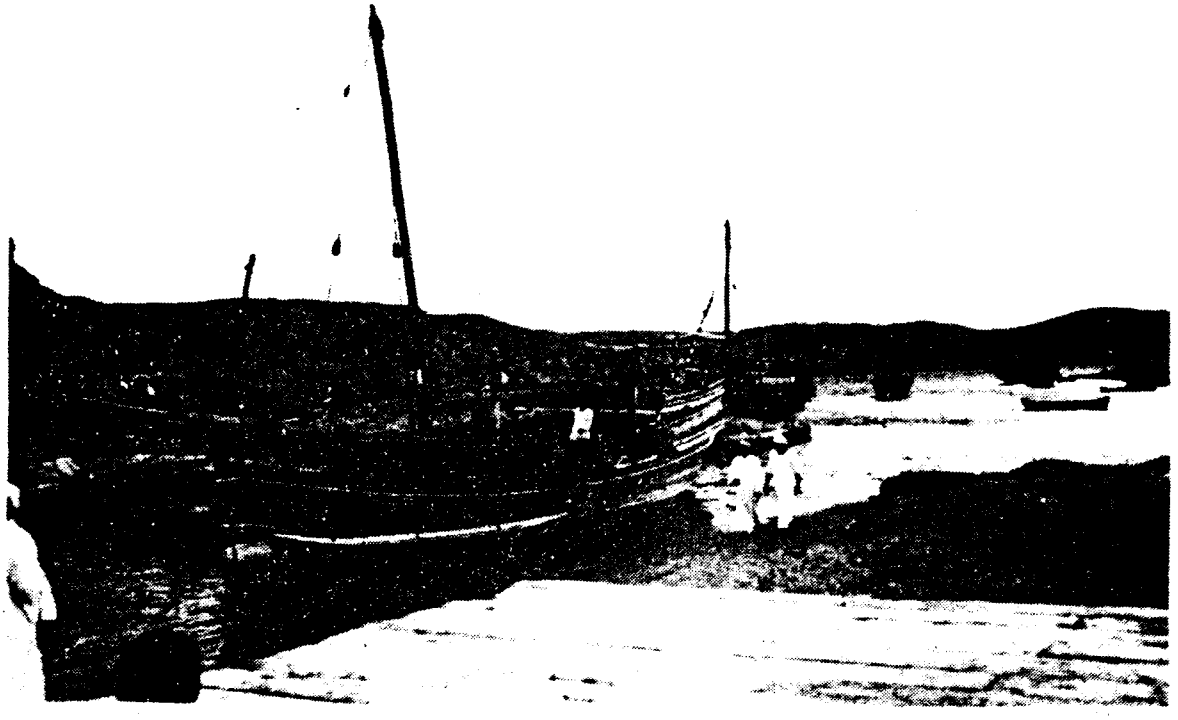


Fig. 703 Sur harbour area

None of the local workers spoken to liked the situation. Though salaries were high outside, working conditions were poor and a certain amount of self respect was apparently lost. Most workers said that they would return to Sur if there was employment or occupations available, however lowly paid. Family ties and type of life found in Sur are obviously held highly by Sur's inhabitants.

Sur imported wood for its boat building and craft industries from Persia and now through dealers in Dubai. Food stuffs and metals were in many cases also imported. On the otherhand craft products and dates from the interior were exported through Sur. With the decline in the market for traditional goods in recent years Sur's prosperity is also in decline. Sur's fleet of wooden hulled sailing ships (dhows) have all had engines fitted, yet still feel the pressure from large steel hulled vessels. Such ships are still being constructed on the traditional model in the ship yards along Sur's and Ayqa's beaches.

7.1.3 Climate Introduction

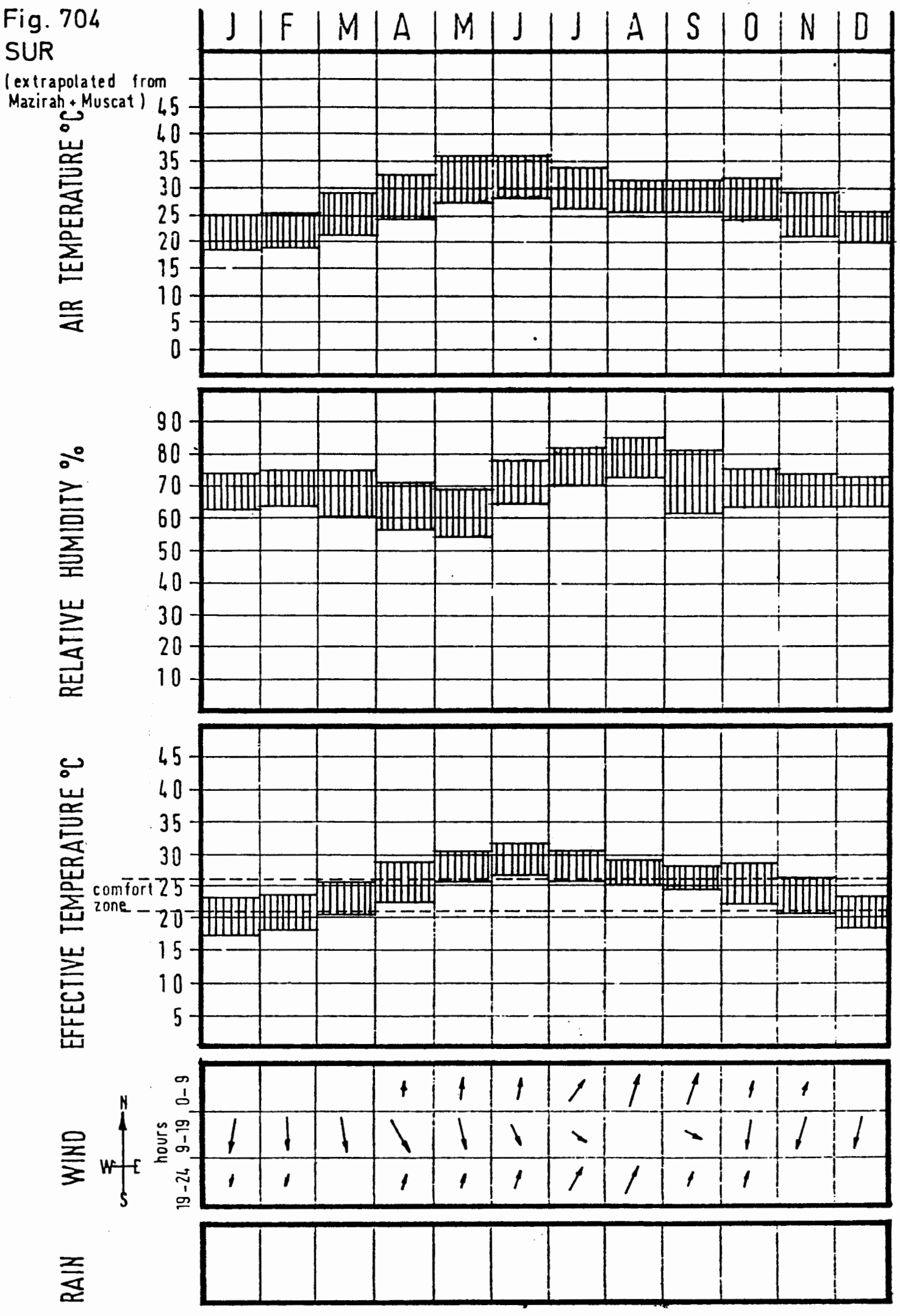
No records of Sur's climate are available from which to draw daily or yearly patterns. The stations at Muscat and Azaiba to the north and Mazira Island to the south gave information from which Sur's climate could be estimated. Discussions with local residents and observations made on the spot yielded some valuable information. See Fig 74 Climatic Charts and Graphs.

Sur is uncomfortably warm in the months between May and September. Midday temperatures in late spring and early autumn are above the comfort level. Generally spring and autumn conditions are favourable. Winter nights are uncomfortably cool.

Sur experiences a relatively high humidity all the year, being on the coast. The late summer sees a rise in the humidity owing to shifting continental pressure systems which relate to the monsoons of the Indian Sub Continent. (See Salala Climate Introduction Section 8.1.3 for explanation of Monsoonal Influence). Although humidity is high here there is very little rainfall. Sur is on the coastal plain on the mountains, where one would expect rainfall some distance away.

Again because of Sur's coastal position it experiences daytime northerly onshore and night-time southerly offshore wind conditions. This daily wind fluctuation. is modified by seasonal variations in the prevailing wind system. In the winter the northerly onshore sea breeze is favoured. The prevailing northerly breeze strengthens the daytime winds and negates or even reverses the normal night time breeze. On the otherhand in the summer a southerly land breeze prevails strengthening the evening and night time winds and somewhat reducing the daytime sea breezes. This is an unfavourable condition in that air movement is required particularly for cooling at midday in the summer when temperatures and humidities are high. The stronger evening breeze would be a welcome relief during these times.

Fig. 704
SUR


(extrapolated from Mazirah + Muscat)
J F M A M J J A S O N D
AIR TEMPERATURE °C
45 40 35 30 25 20 15 10 5 0
RELATIVE HUMIDITY %
90 80 70 60 50 40 30 20 10
EFFECTIVE TEMPERATURE °C
45 40 35 30 25 20 15 10 5
comfort zone
WIND
N W E S
hours
0-9
9-19
19-24
RAIN

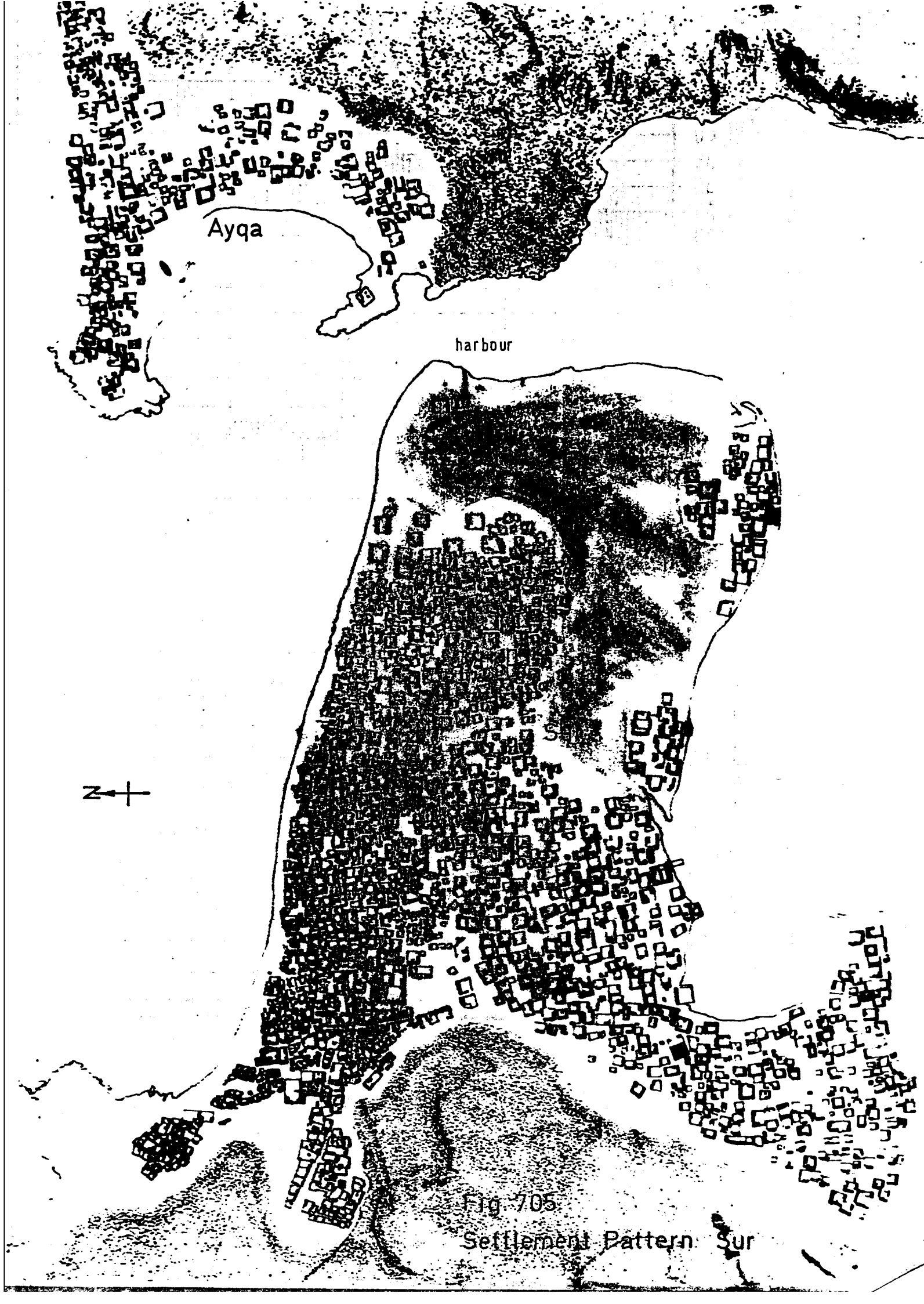


Fig 705

Settlement Pattern Sur

7.2 Settlement Patterns

7.2.1 Physical Influences (Fig 75)

Because of physical restrictions the built area of Sur is limited. It is surrounded almost completely by water, being connected by a stretch of land in the north west corner to the rest of the coastal plain. Large areas of what appear to be dry land are subject to flooding with occasional high tides and can not be built upon. Since economic activity for the whole region centres on Sur because of its harbour and trading facilities, a densely clustered built environment is the result. Sur's high density is therefore a response to a combination of economic and physical pressures.

7.2.2 Social and Economic Influences

The occupants of dwellings on the extremities of the settlement cluster tend to be occupied in activities related to the sea or which would require access to the sea. Fishing and boat building are the chief occupations of these inhabitants. The residential areas of Sur have a relatively uniform high density (generally a two story built area), with houses, mosques and the occasional shop built either immediately beside each other sharing a common perimeter wall, or separated by a tiny alley or passageway. Streets are narrow and corridor like and run roughly at right angles to each other. Principal streets connect the perimeter of the settlement (shore area) to the market (suq) area (Fig 76).

The suq area is the social and economic focus of the community. Tradesmen's and craftsmen's workshops are found along with a number of cafe's. The suq area is the only area that differs from the typical dense settlement pattern. The market activities are located around a large open square, which is unobstructed, by permanent buildings. The area is left open for sellers to set up temporary stalls during the market times (Fig 78). A great many of these merchants have not sufficient goods to maintain a permanent shop, or deal in food stuffs which tend to be seasonal. Open space for such a market is therefore essential. Fish and meat sellers also operate in the open square selling their goods on mats on the ground, (Fig 77) sometimes in quite unhygenic conditions. Although each meat or fish seller may not make use of the market every day and thus not require a regular shop, meat and fish are sold consistently throughout the year and some sort of permanent hygenic selling and cutting quarters are needed. If established it would have to allow for various different sellers using the facilities from day to day and need not be seen as a permanent lock-up shop arrangement.

On a social level the open space of the market place is essential when seen in the context of Sur's high density settlement pattern. The openness is a relief to the confinement of the narrow street. The market becomes a place for larger groups of people to meet and interact, with the cafes acting as foci.

Although the traditional economic focus of Sur has been on the market, it has recently begun to shift with the Government financing new building outside the town. A new hospital and schools have been built west of Sur providing initially some construction work and currently some ongoing maintenance work for a limited number of the local population. These institutions obviously serve more than just the town of Sur and include Bilad as Sur as well.

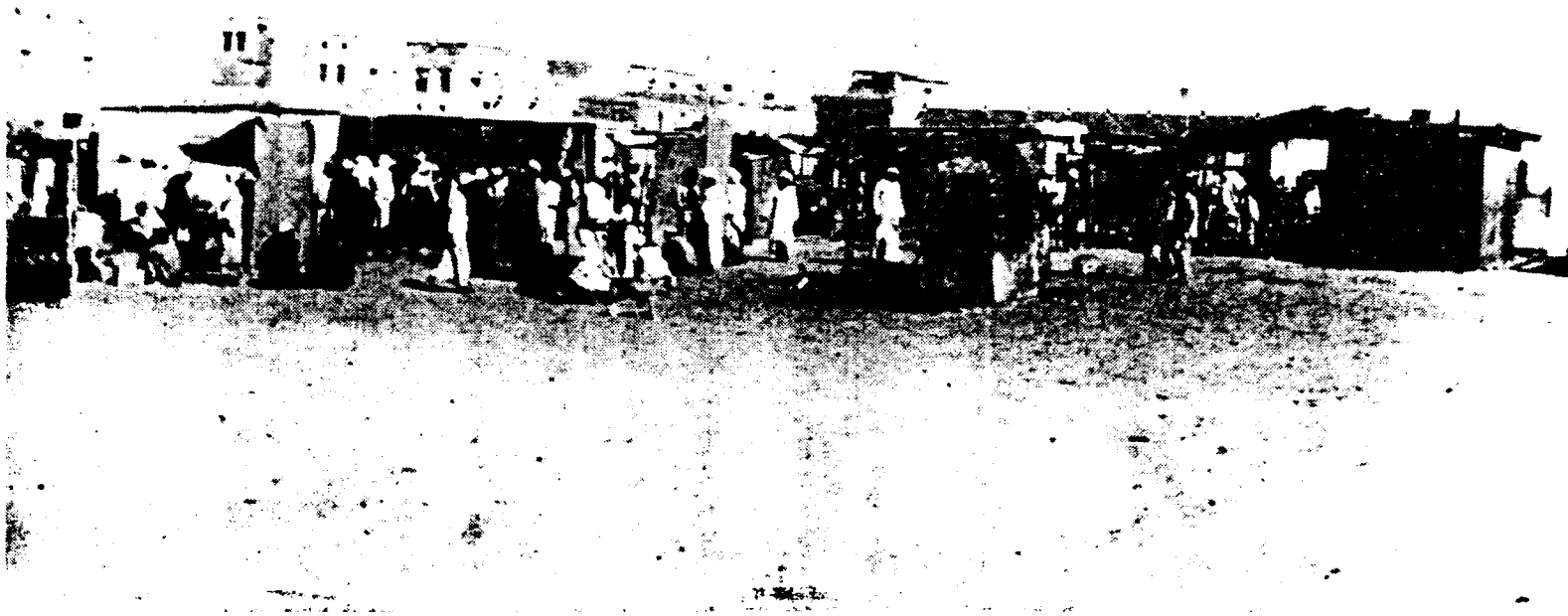
Various proposals have been made for the development of Sur. One suggests the extension of the built area of the suq into what is now the open space. If large parts of what is now open is built on, the local use of the area will

be drastically altered. Existing shops and cafes are organized as they are now because they do face on to an open square. The function of the open square as a place for temporary sellers (who are indispensible with their sales of fresh foods) would be disrupted if the area was built up. On the otherhand the square as it exists at present is hot and dusty and facilities could be developed to aid the temporary food sellers and the shoppers. Fish and meat selling should be upgraded in order to ensure hygenic conditions.

Another proposal sees the shifting of the economic centre away from the traditional town centre. It is understood that Sur town is physically built up to its maximum extent and very little land is available. Following the logic of the siting of the hospital and school, new development is proposed in an area outside to the west of the existing centre. It should be remembered though, that the majority of the people still live in the old town areas, which function very well socially though no longer economically. New development should not ignore these areas. Improvements should be made to upgrade both the residential, public and commercial areas. Existing local craft and building industries which are on the decline should be stimulated and new industries appropriate to the potentials of the area should be established to employ people already living in the existing town area (since unemployment is such a major problem among the existing members of the community). To begin with development is needed to make the existing and improved facilities viable again.

Fig 77
Fish sellers temporary stall

Fig 78 Suq area - temporary stalls erected in open space.



7.2.3 Climatic Influences on Settlement

The critical climate conditions occur in Sur in the summer months when there are high temperatures as well as high humidity. During this season air movement could provide relief to uncomfortably hot conditions. In high humidity areas such as Sur, means must be undertaken to encourage air movement in the hot season. In the settlement pattern this requirement is usually seen in the wide spacing of building units to encourage uninhibited air movement to each building (See Salala Section 8.2.2.).

It has been stated although that due to the pressures of space and Sur's restricted site a high density settlement has resulted. This density unfortunately inhibits air movement which is needed in the summer months. It must also be remembered that during the daytime during the summer months wind velocity is relatively low (refer section 7.1.3) and only increases in the evenings. Air movement must be induced in other ways.

The narrow streets and passageways of Sur remain in shade most of the day and are therefore cooler than larger open spaces such as the central square of the suq which is unshaded and heats up due to the sun's radiation.

Local convection systems will result as hot lighter air in the open sunny spaces rises and is replaced by cooler heavier air from the shaded streets. Localized air movement is therefore induced along passageways as it is being drawn to open spaces. Similarly courtyards within the houses heat up depending on their size and the amount of radiation absorbed and draw air from the shaded streets through the house and aid cooling. This phenonena is observed often in densely clustered communities in hot dry regions where there is a clear sky and solar radiation is intense and there is a very marked temperature change between shaded and sunny areas. Sur on the other-hand has a humid atmosphere, meaning that the sky will tend not to be as clear, hence the contrast between sunny and shaded areas is not as great. This phenonema of air movement can not be expected to function as efficiently as one would find in a drier climate area.

7.3 House Form

7.3.1. Social and Economical Influences

The courtyard house is the dominant town house form observed in Sur. This form is basic to houses of wealthy merchants as well as to those further down the economic scale.

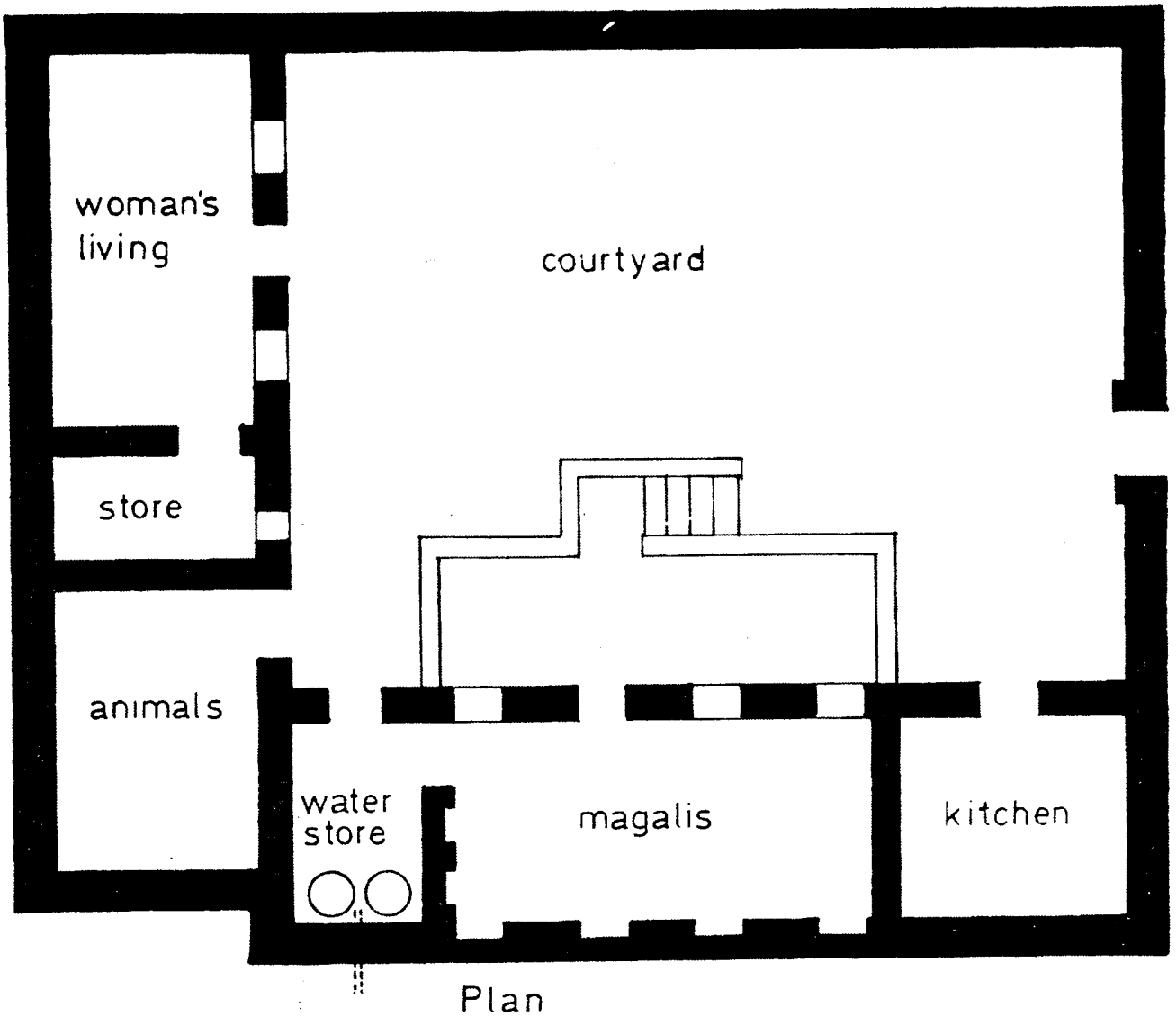
A perimeter wall generally 2.5 metres or more high defines the site, and a door opens through this to the street. Generally one passes from the street directly into the open courtyard. The built area of the house follows along the perimeter wall. Rooms would generally be added one by one starting with building from the back wall of the courtyard, eventually extending along two or three walls of the courtyard but not usually enclosing it completely on four sides. A first floor usually follows. Though material may differ this same type of form occurs in recently constructed houses as it does in older houses. Refer to two houses studied, one 150 years old (Fig 79) and the other recently constructed (Fig 710).

In a densely built up settlement where population density is also high, provisions for privacy become important. Where many houses have two floors and usable roofs, and the dominant form is the open courtyard, visual privacy between houses becomes important. A view of someone elses private courtyard is socially unacceptable. First floor decks are arranged whenever possible so that no such view can occur. Walls between houses are built up for visual privacy, just as are the courtyard walls. Areas of the house i.e. roof or upper floor deck which may have a view of a neighbour's house are unused, out of bounds.

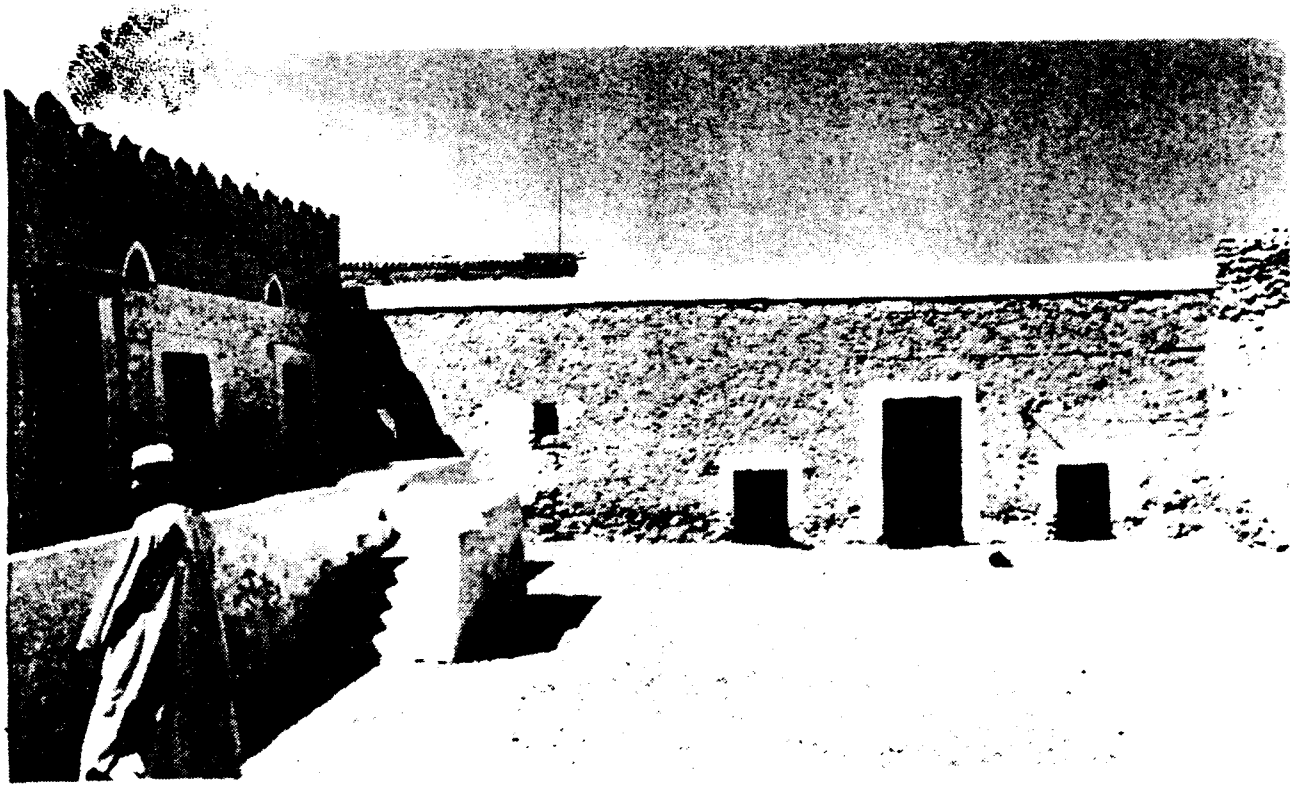
Windows are kept to a minimum on the ground floor and rarely open onto the street. Windows which once existed but due to new building around now have a 'compromising view', are blocked up. Lattice windows and claustre work screens maintain visual privacy by allowing a view out but not in and allowing air movement freely through (See section 3.3.3 Batinah on Barasti-Lighting and Privacy). In the past lattice screens made out of palm stems were used in windows (Fig 711). These were set into the walls of substantial limestone houses.

In more recent houses these lattices have evolved into more sophisticated 'louvres'. In a house studied louvres were used in a first floor room (Fig 712). Windows were placed on opposite walls so as to allow for cross ventilation. Windows were set at a height low enough so that the breeze would blow at floor sitting height. One window opened onto the owner's courtyard. This one had louvres with slats set so that one could look down into the yard and follow the activities there. The other window faced onto the neighbour's roof. Louvre slats in this window sloped upward so that a view down to the neighbour's house was not possible (Fig 712).

Fig. 709



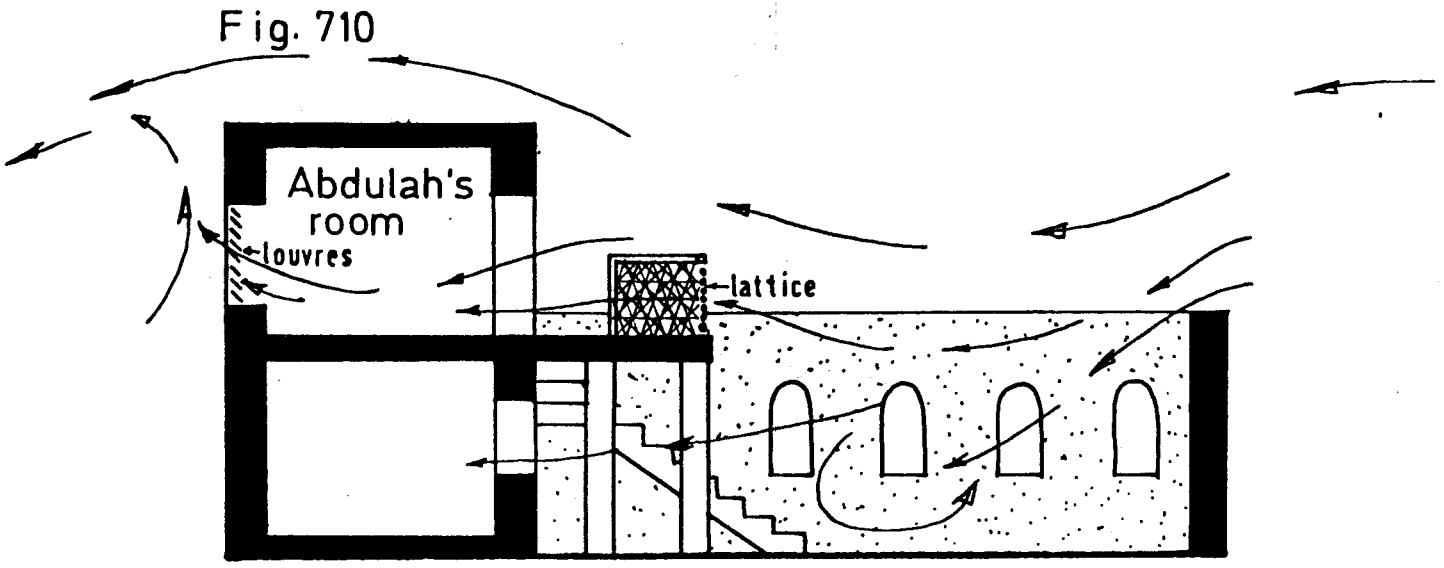
Plan



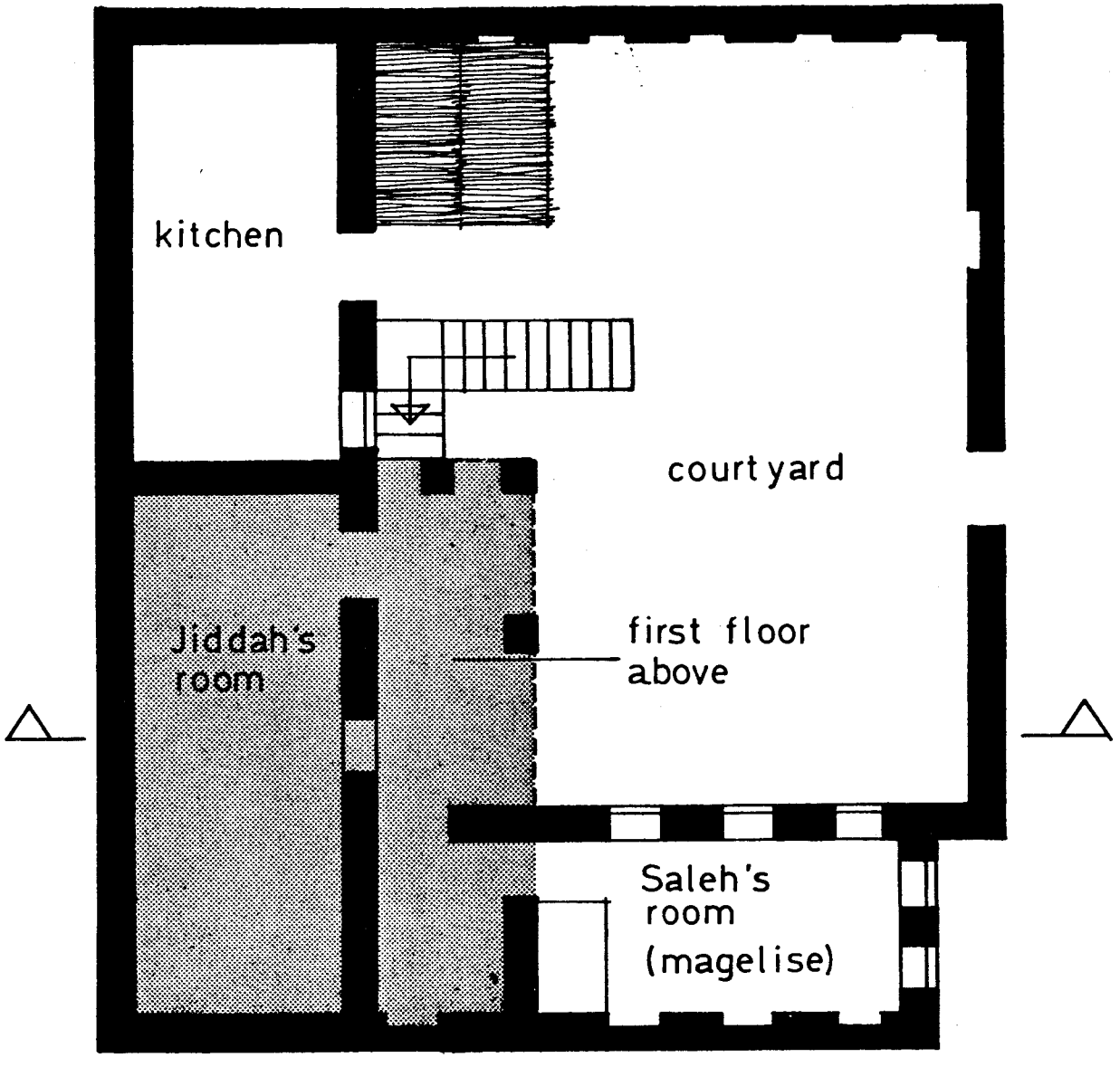
View of Courtyard

150 year old limestone house in Sur town centre

Fig. 710



Section
showing air movement



Ground Floor Plan

House of three brothers - Sur town centre
recently built in concrete block

7.3.2. Climatic Influences on House Form

As stated earlier during the summer months in Sur, the heat and relatively high humidity produce thermally uncomfortable conditions that only air movement can relieve. The settlement pattern is such that the dense clustering of buildings inhibits or blocks the wind thus reducing the wind velocity within the town from what it would be in the open or in a place where buildings are adequately apaced. Convection systems set up between the shaded streets and open spaces have only localized effects.

Although the settlement appears dense at first glance, within the house's perimeter wall there is a considerable amount of open space in most cases. From the climatic tables (Fig 74), particularly the wind chart it can be seen that during the day time hours when air movement is needed most for cooling, there is a northerly sea breeze most often. The consideration of this fact is reflected in how the built area of the house is organized within the perimeter walls. It is found that generally the rooms of the house are built along the south wall of the site leaving an open court in front. Though as the house expands the court will begin to fill up and an open space is left in the northern portion of the site. A second story is added above the southern part of the house in order to leave the court as large as possible (See Fig 710). This open space allows the wind to somewhat regain its original force after being slowed by resistance from built forms in its path. Every obstruction in the path of the wind, has behind it what could be called a wind shadow, or an area of decreased velocity. The reason for the absense of building on the northern part of the site is because this area invariably lies in the wind shadow of other buildings. Further stories built above ground level accept more air movement since wind velocities increase the higher one goes above the ground. The dense clustering and narrow streets also ensure that walls remain shaded most of the time and do not heat up due to solar radiation.

The winter months on the otherhand are found to have cold nights which tend to be uncomfortable (Fig 74). Since the majority of buildings within the town of Sur are made of thick limestone construction, their thermal properties will act to moderate the temperatures. Exterior walls heat up in the daytime and slowly transfer their heat into the interior. The interior wall surfaces tend to maintain a temperature which is the average of the day and night time temperatures. Thus night time internal temperatures being about the daily average are above the cool outside air temperatures.

Sur unlike other dense urban areas further north (i.e. Dubai) has not adopted the windcatcher or badgir. The windcatcher tower extends above the roof level into the clear air stream and draws the cooler air down, into rooms of the house where it helps cooling. This feature could be easily adapted to buildings in Sur (Refer to Batina Coast Section 3.3.2).

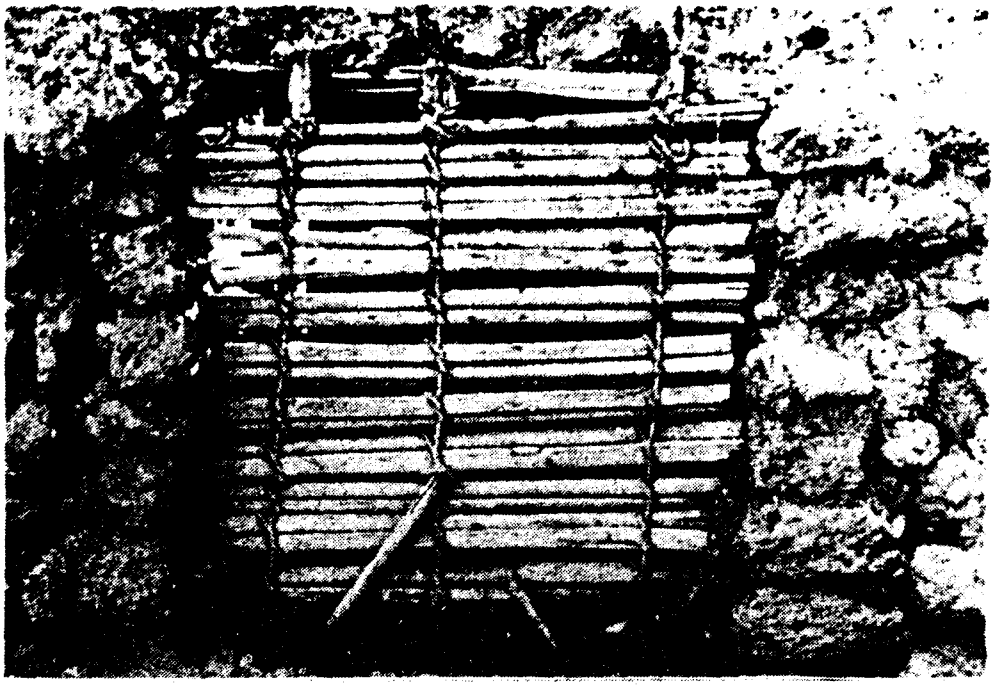


Fig 711 Barasti used in a window opening to form a lattice

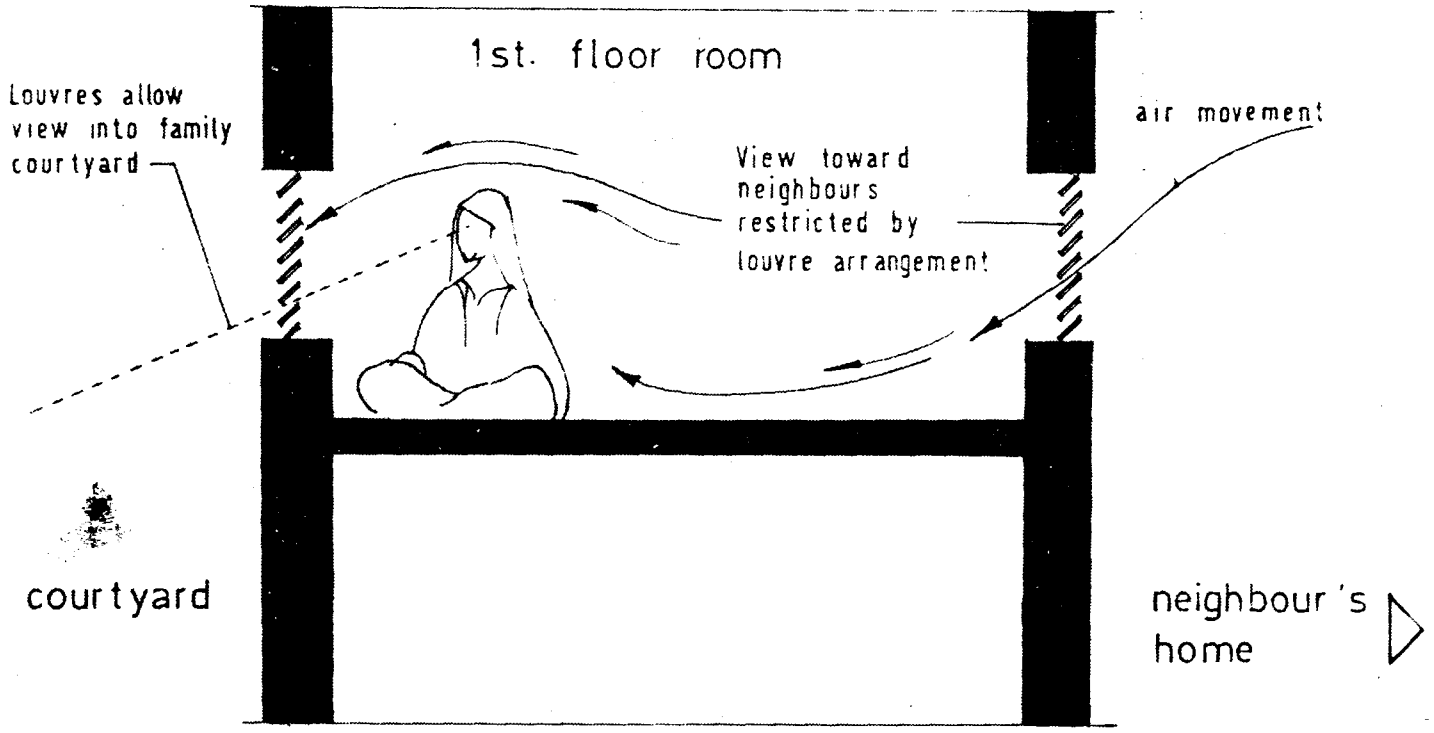


Fig 712 Louvres ensure visual privacy but allow air movement

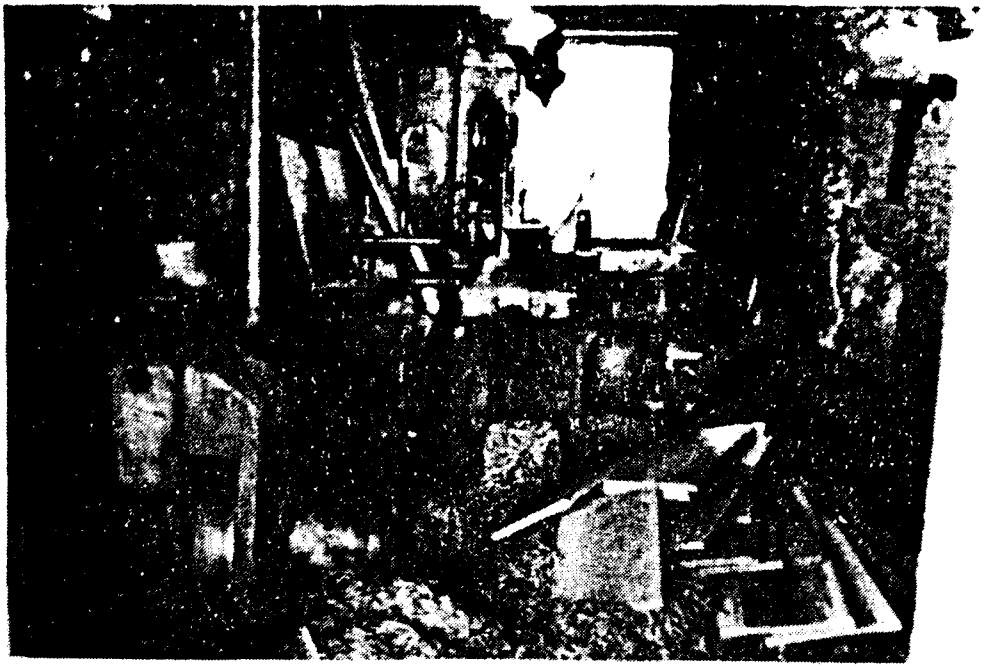


Fig 713 Mechanized carpenters workshop in Sur

Fig 714 New, locally made door on Indian model.

7.3.3 Materials and Techniques

Limestone is the material used most often in the town houses of Sur. A mud mortar is used to set stones in place. A gypsum plaster is often used on the exterior walls. The quality of limestone varies greatly. Soft stone is quarried along the shoreline and harder stone further inland. The soft stone weathers easily and must be maintained pariodically. Smaller loose stones are often collected for wall building and are set with mud to form a wall which shows properties of both mud and limestone, and must be kept in good repair and rendered often (Fig 72).

Cement block is now being used in the newer buildings. Its regularity means that construction is easier. On the otherhand cement block is more expensive than the loose stone which can often be collected by the owner builder. Quarried limestone block, cut and standardized could prove more expensive (See Dhofar Coastal Plain Section 8.3.3).

In many cases houses are owner built, though local builders do exist. Stone and concrete walls can be easily constructed by labour which can be supplied from within the family. Wood construction and detailing on the otherhand is done by craftsmen, generally in their workshops.

Wood working crafts are still in existence though declining in number. (Only three or four workshops remain that make doors, windows and cabinets. Fig 713). These in most cases have adapted to the use of new available timber and have become somewhat mechanised using powered equipment. Along with these techniques have come imported styles (particularly from India) and a certain amount of standardization (Fig 714). The extremely fine examples of door and window woodwork around Sur seems to have been forsaken (Fig 715). This is particularly a result of handwork giving way to machine productions.

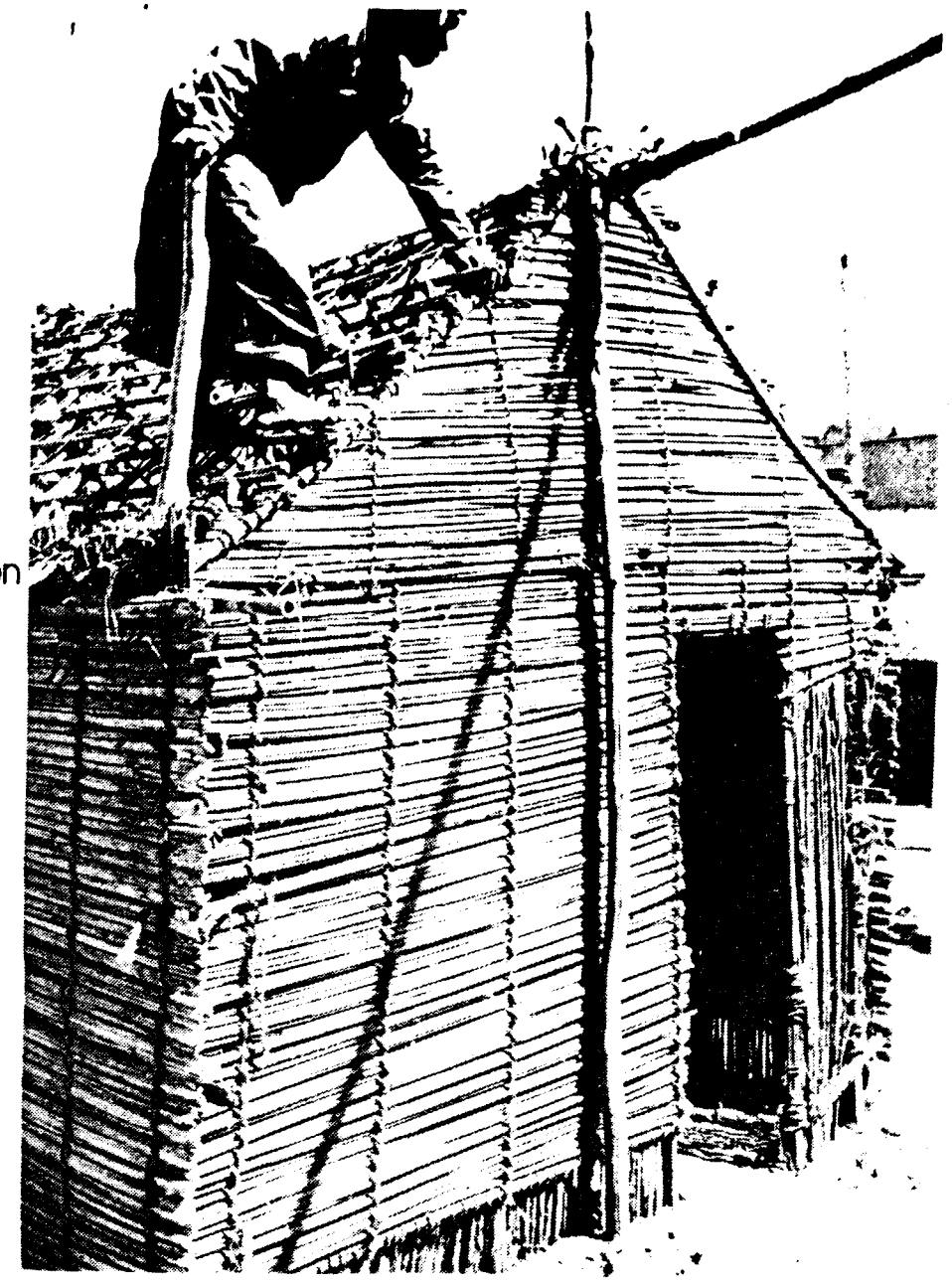


Fig 716
Barasti
house
construction

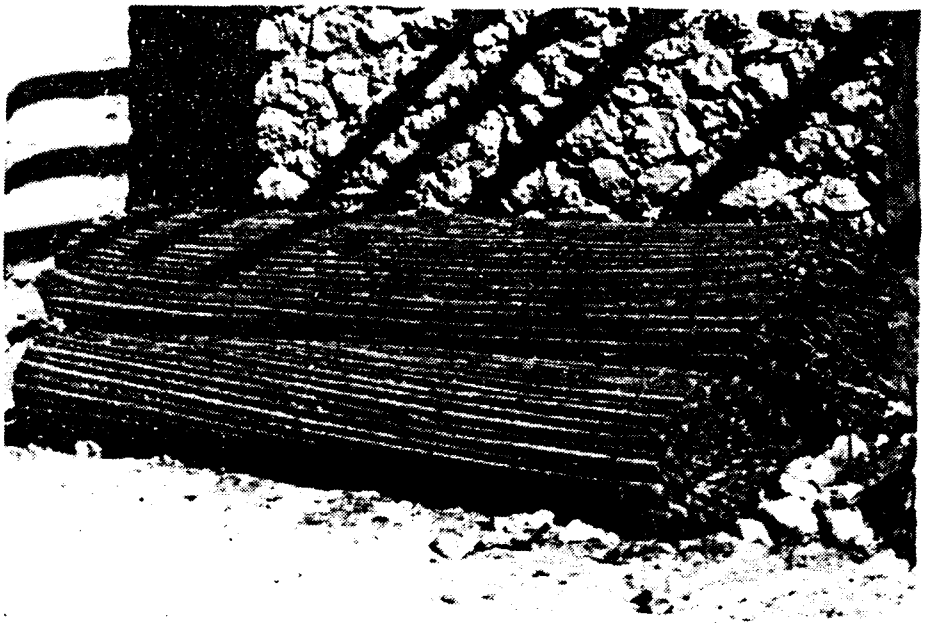


Fig 717

Barasti panels can be rolled and stored