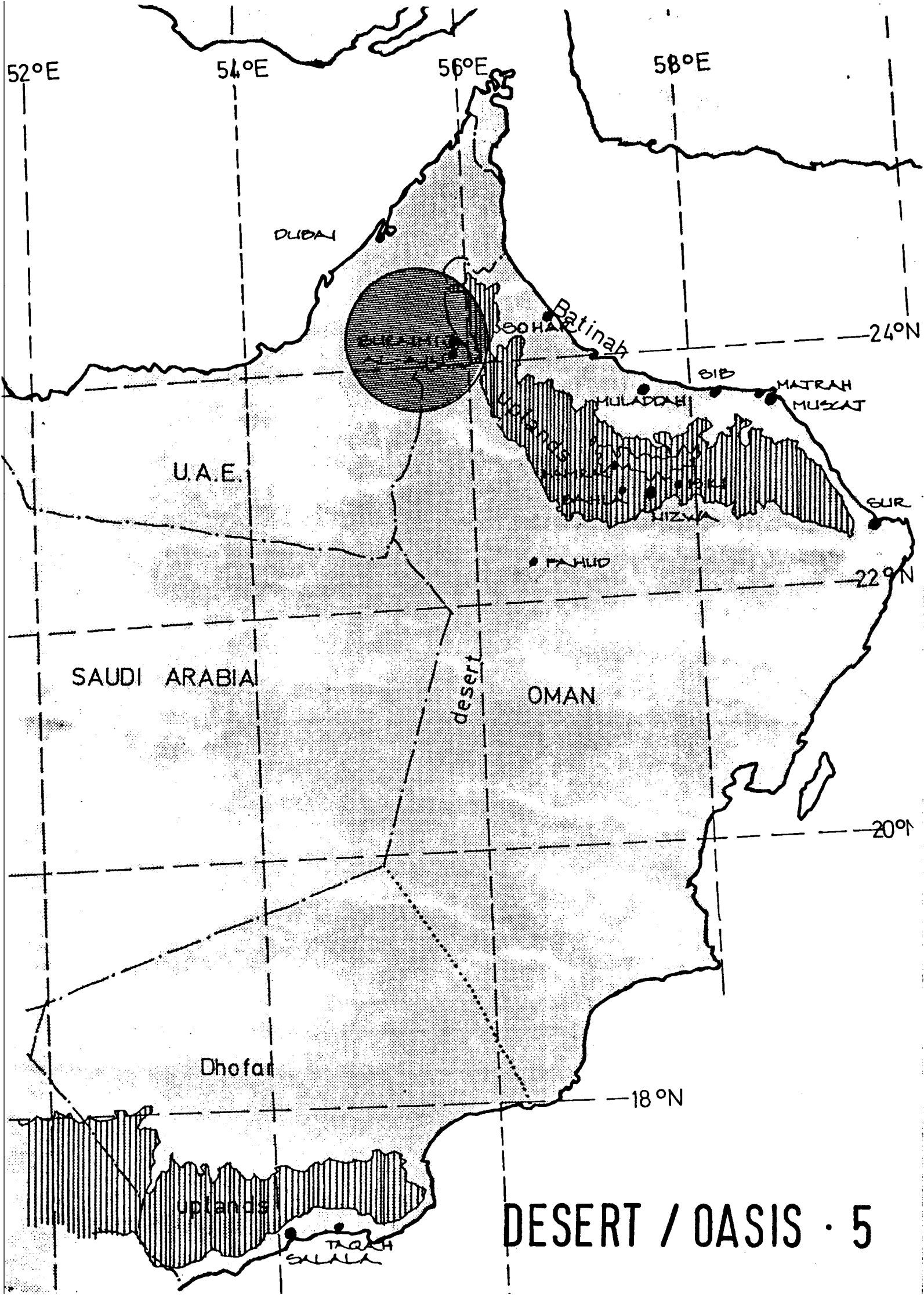
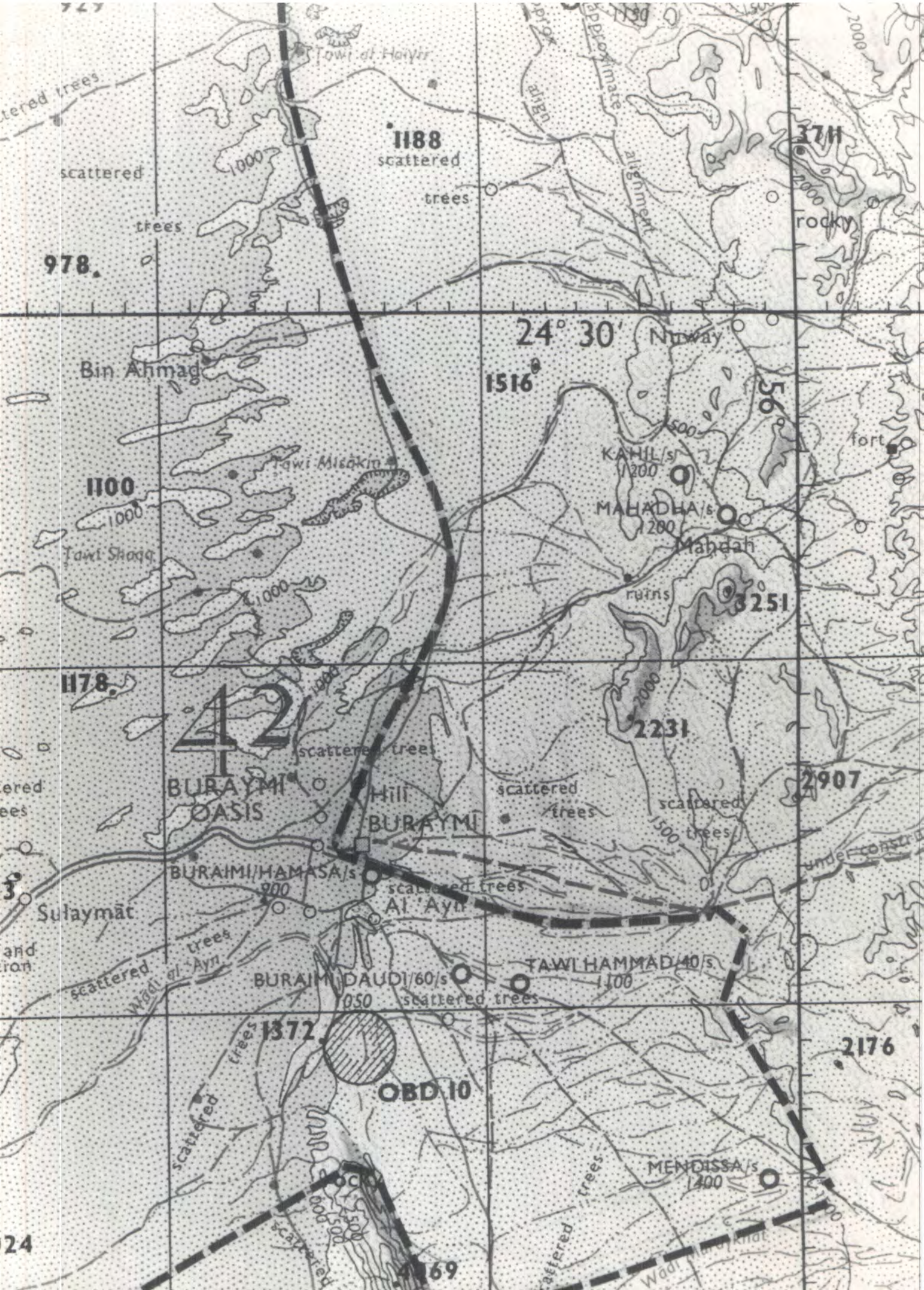


DESERT / OASIS · 5



1188
scattered
trees
scattered
trees
978
1100
Tawi Shaqq
Tawi Miskin
Bin Ahmad
1516
24° 30′
Nuway
KAHIL/s
1200
MAHADHA/s
1200
Mahdah
ruins
3251
3711
rocky
fort
2231
2907
1178
42
BURAYMI
OASIS
scattered trees
Hill
BURAYMI
scattered
trees
scattered
trees
BURAIMI/HAMASA/s
900
scattered trees
Al 'Ayn
Sulaymat
TAWI HAMMAD/40/s
1100
BURAIMI DAUDI/60/s
050
scattered trees
1372
OBD 10
2176
MENDISSA/s
1400
4169
Wadi al 'Ayn

5. DESERT - OASIS

5.1.1. Introduction. Buraimi Oasis

An oasis is an area of vegetation and water supplies surrounded by the desert, and can be so small that only one or two trees find enough water to grow, or it may stretch for miles, providing huge areas for agriculture in an otherwise barren area.

Buraimi is one of several oases and gives its name, being the largest, to the whole area. The main settlement lies about 16 km to the west of the mountains which are the north west extension of the Jebel Akhdar*1, and is roughly at the point where the gravel foothills finally merge into the rolling red sand dunes of the desert. (Fig 501). This group of oases is divided up between Oman and Abu Dhabi, although there is free movement from one country to the other. There are altogether about eight settlements in the Buraimi oases, each of which gets its water supply from Falaj systems running down from the mountains in Oman. The two main settlements are Buraimi in Oman and Al Ain in Abu Dhabi. The principal communications link is an asphalt road from Al Ain to Abu Dhabi on the coast.

There is also an extremely poor rough track across the mountains linking Buraimi with Sohar, but this road does not play the important role is could if it were greatly improved. Buraimi also has a dirt airfield used by Skyvan flights from Sieb (near Muscat) which provides the best existing link with the rest of Oman, even if rather limited.

The weakness of Buraimi's existing links with the rest of Oman highlights its position in the shadow of Al Ain as opposed to its being a town in its own right. Al Ain, fed by the oil revenues of Abu Dhabi, has over the years developed into a sizeable town with many facilities ranging from a Hilton Hotel and cinemas to a 'modern' air conditioned Suq. The asphalt road links Al Ain with Abu Dhabi and Dubai where all produce for the area is imported. There are also schools and a government welfare housing system. This development has eclipsed the more prominent role that Buraimi played in the past, when it supplied dates and vegetables to the local arab tribes. Over the last few years its progress has been nil. The result has been to draw people from Buraimi into Al Ain for their work, education, entertainment and shopping, for example most of the arab shopowners have left the Buraimi Suq which is now largely occupied by Persian, Pakistani and Indian shopkeepers, who complain of the difficulties of keeping up their trade in the face of Al Ain's competition.

Al Ain has a non productive economy with its service and commercial activities subsidised by oil revenues from Abu Dhabi as a whole. Everything, including food, is imported and the consequences of this are reflected in a loss of culture and innapropriateness in the built environment where the use of completely foreign methods and materials has led to unnecessary expenditure and extravagant design. Buraimi on the other hand has an agricultural potential which could be used to replace some of the food imports and to develop a much more productive and diverse economy, which is necessary since the lately developed oil industry of Oman provides only a limited revenue compared to that of the Emirates, and is insufficient to subsidise the national economy. Recently the production of dates has dropped because of disease in the trees, and some other crops, such as grapes, are not successful, but vegetables seem to thrive and are on the increase.

*1. This same range of mountains runs right up to the Musandam Peninsula, the isolated northern Province of Oman.

The built environment of Buraimi could develop on a much more practical and economic basis, which would also be culturally consistant (suggestions for this are included in the proposals section 9). Improved road links to other areas of Oman will also help. The link to Sohar could allow fish to be brought to the interior, and likewise agricultural and craft products from the Northern Uplands could be marketed in the Emirates, thus beginning to reverse the flow of imports into Oman.

The potential characteristics and relationships between the two settlements reflect in a microcosm the situation between Oman and the Emirates. The Emirates have developed depending upon oil as their sole source of income, and all their requirements are imported from elsewhere. Oman on the other hand has only a limited oil potential, with supplies running out in the foreseable future, but it is fortunate in that this places the emphasis on its agricultural potential and the development or consolidation of rural industries, which could lead to it having a viable diverse economy involving the whole population and not dependant upon oil.

Houses in the Buraimi area have been built predominently with mud brick; there is only a limited use of palm frond stems but both concrete block and corrugated iron are becoming increasingly common, the latter notably in shops and the Suq area, whilst many houses are now built of concrete block. A local builder says that there is now very little building work using mud brick, and what little he does is usually repair work. The pull that Al Ain exerts on the population of Buraimi indicates a rather low building rate using any material.

5.1.2 Oasis Climate

Buraimi: No climatic data is available for the Buraimi Oasis. However climatic data is available for Fahud in the desert. There is an indentifiable relationship between an oasis and the desert, and from this the climate of the Buraimi Oasis can be extrapolated.

Desert - Oasis Climatic and Micro-Climatic Comparison

Considerable differences are found between desert climatic conditions and oasis conditios even though they are in the same general area. By irrigating an area of desert, the temperature, humidity and air movement will be changed not only in the oasis but in the desert areas immediately around it.

In a desert the high temperatures are largely the result of the sun's rays radiating off the soil (Solar radiation) into the air. This is particularly strong near to the surface of the ground where air movement is practically nil (there will be vertical air movement due to hot air rising, but this has no cooling effect), and thus has no dissipating effect on the temperature, which can be twice as much at ground level compared to head level.

An oasis modifies the desert situation to a considerable extent primarily because of the high moisture content in the soil and plants. The dry air in contact with these surfaces allows evaporative cooling which in turn causes the moisture content of the air (relative humidity) to rise, and the air temperature to drop. The extent to which the relative humidity and air temperature are modified depends on the amount of moisture in the soil and the amount of air movement in the area. The relationship to the surrounding desert air movement is weaker in the oasis because the winds are partially deflected by the denser cool air mass and by the planting.

Also unlike the desert climate, the temperature in the oasis increases with height rather than decreases, being coolest near the moist soil and plants and warmer further above and away from them. Thus there is no upward movement of air, dust does not rise and moisture evaporating from plants stays close to the ground.

Because of the darker colours of the planting and fertilised soil of an oasis compared to the light desert surroundings, an oasis in fact absorbs approximately 15% more solar radiation. This to some extent lessens the cooling effect in an oasis. Nevertheless the average daytime soil temperature in the oasis is approximately 15^{oc} cooler than the surrounding desert, and the relative humidity is much higher.

Finally the influence on the desert of a small irrigated oasis is felt within a radius equalling approximately 1/3 of its diameter. The effects are most marked within several hundred metres of its boundaries, the strongest influence being in the area downwind of the oasis.

The Buraimi Oasis

The Buraimi Oasis basically has a climate in between the hot dry desert and the maritime desert climates. It is not modified to the extent of the latter since it does not have effect of the large moisture content of the sea and the air over it, nor does it have the daily land and sea breezes. Equally, although there is a distinct hot and cold season and a wide diurnal range of temperature neither are as extreme as in the hot dry desert climate. The relative humidity is much higher than the desert's but it is still quite moderate. There are seasonal prevailing winds which are stronger in winter than in the summer and rainfall is low, corresponding to the occasional flash floods that occurs during the winter in the desert. (Climatic Data Fig 502 + 503).

Fig. 501

FAHUD

desert climate

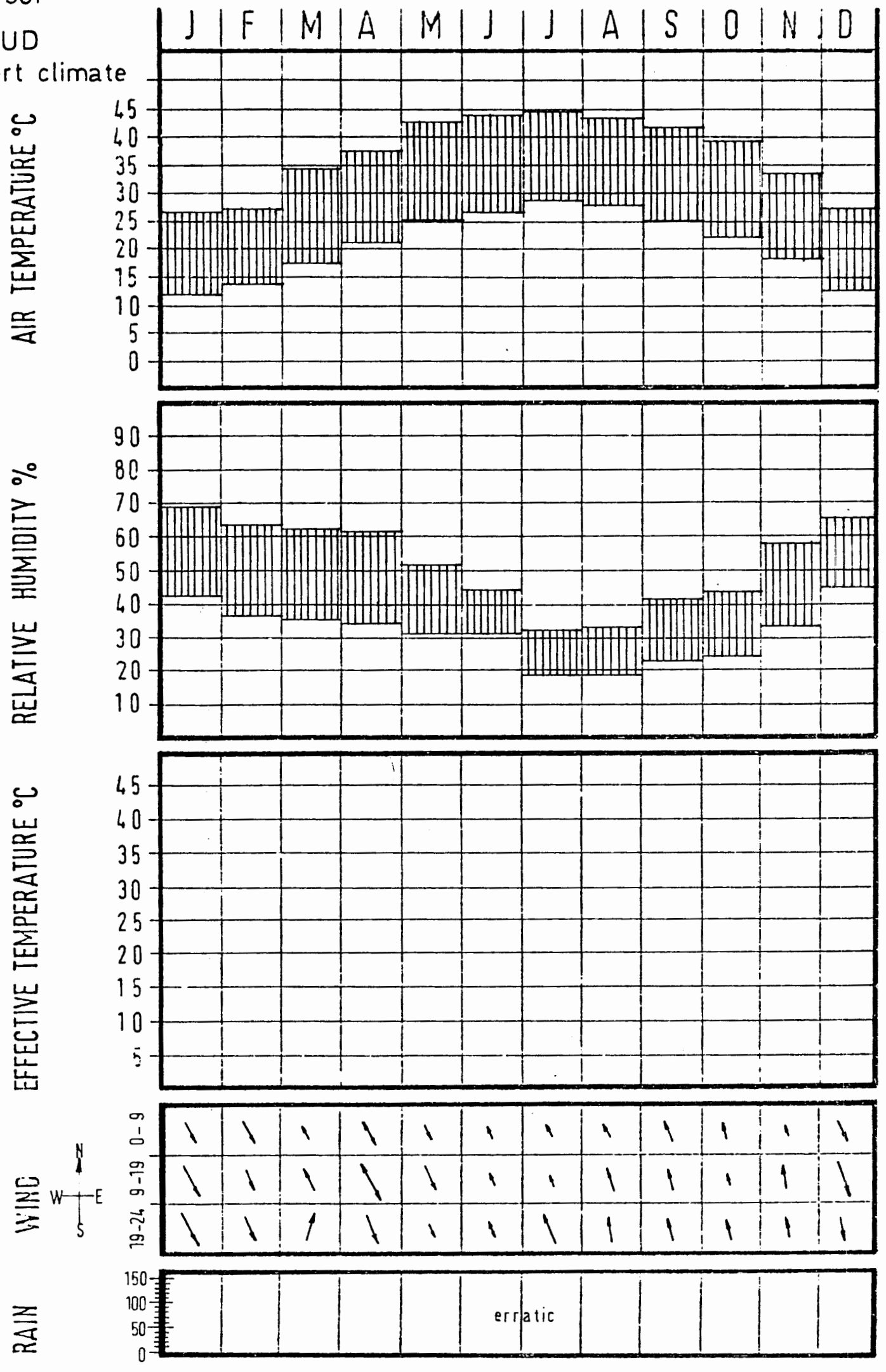


Fig. 502
BURAIMI
oasisi climate

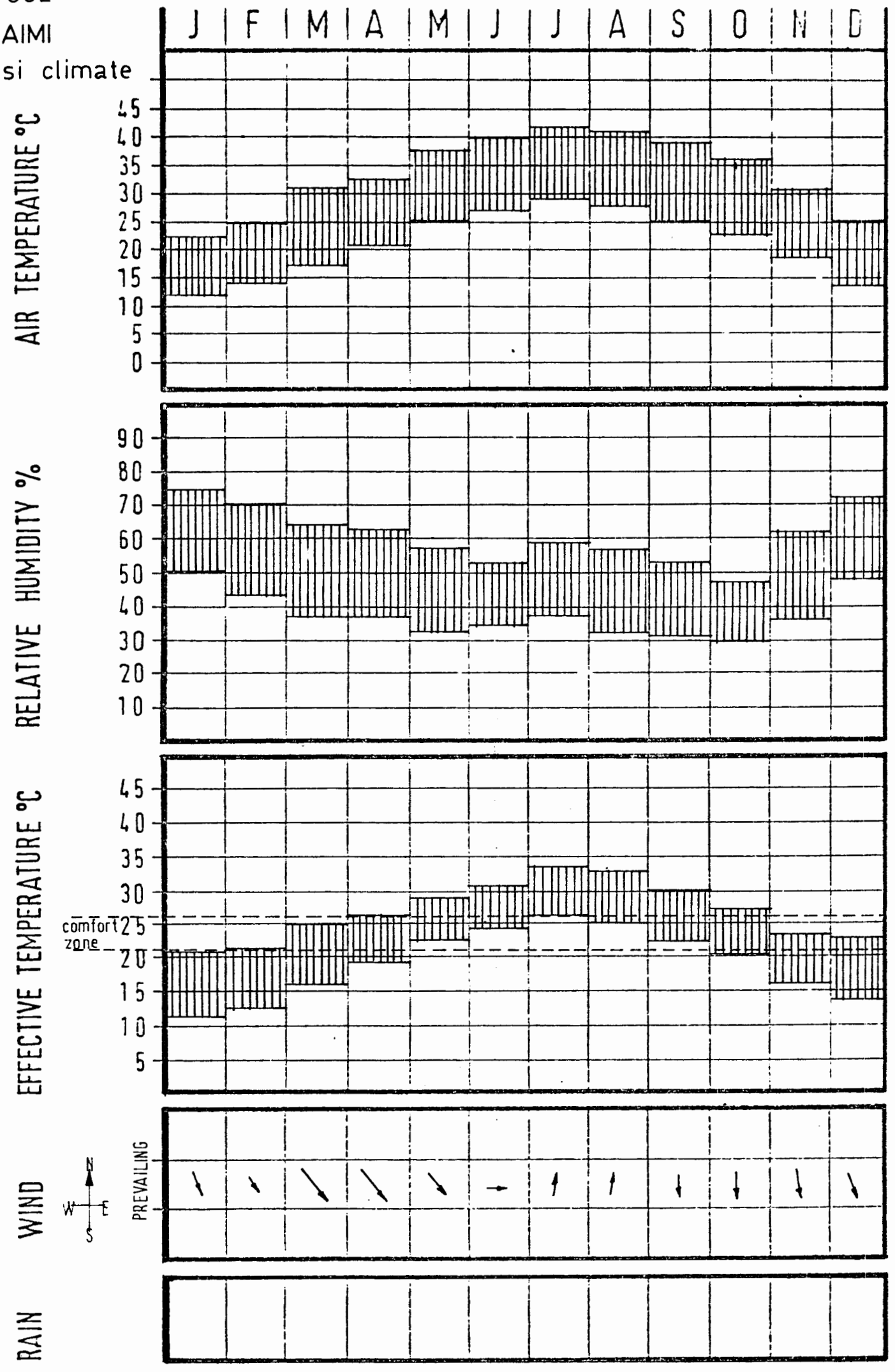
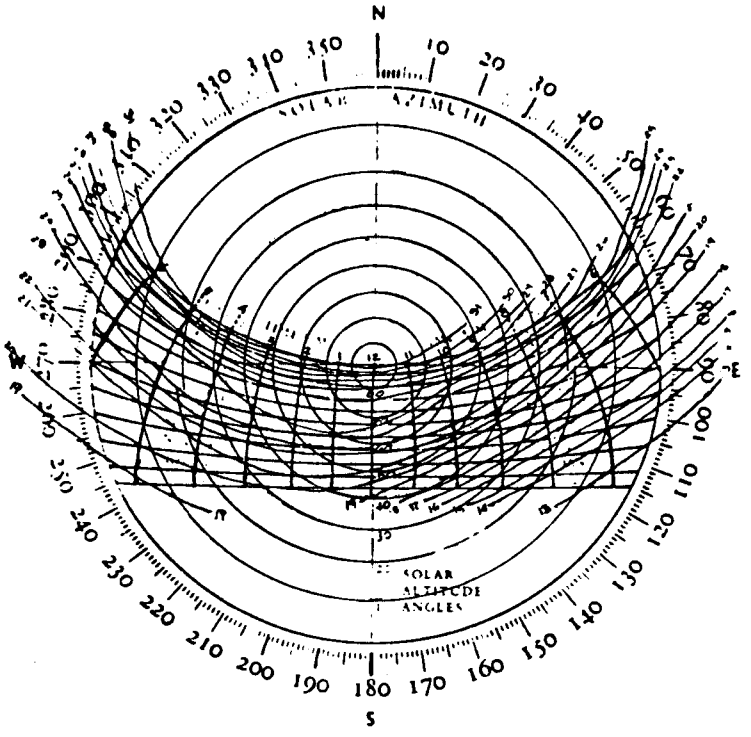
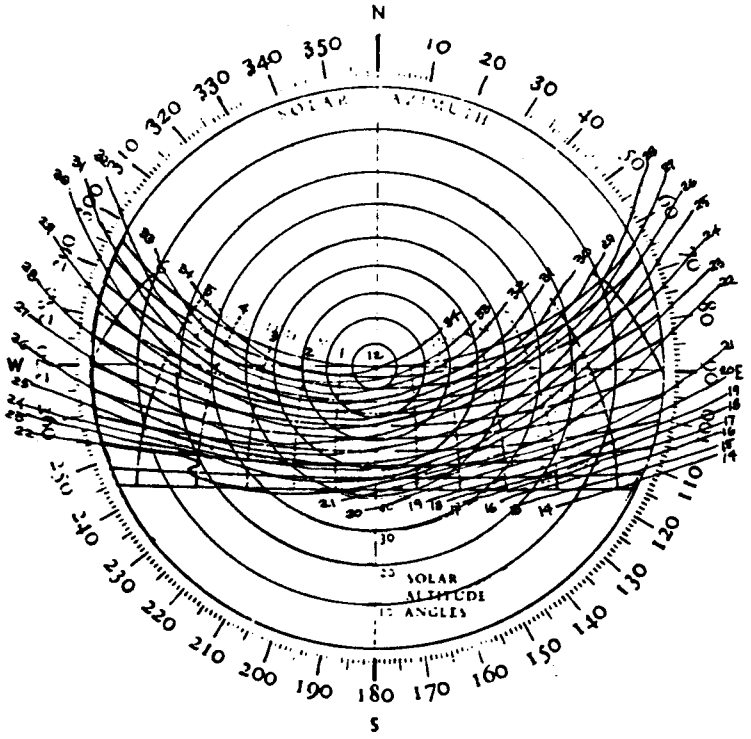


Fig 503



JANUARY— JUNE



JULY — DECEMBER

SOLAR CHARTS WITH TEMPERATURE OVERLAY

BURAIMI

BURAIMI SETTLEMENT PATTERN

5.2 Settlement Patterns

Water is the main factor which originally influenced the settlement pattern of Buraimi. It is supplied by Falaj systems (underground and surface water channels), which by their very nature in an undulating area can serve only a limited area. Hence there is a need to use as much of the potentially irrigatable land as possible for agriculture, with the result that as in the settlements in the Jebel Akhdar Region (Section 4) the houses are generally built on land unsuitable for cultivation i.e. land innaccessible to the water from the Falaj. There are within this pattern two types of settlement; the major settlement areas, including the Suq and forts, are all situated around the periphery of the date gardens. The main streets within each group of buildings are wide, and even the small side streets are not narrow enough to be protected from the sun, since the houses and shops are mostly one or two storey buildings, providing little shade to the open spaces inbetween. The Suq, however, is completely covered over, including the main street that runs its entire length.

As well as the main settlement areas, there are also houses scattered amongst the date palm groves. These houses, and the footpaths giving access to them, are set several metres above the level of the date gardens, which lie at the same level as, or slightly below, the Falaj channel, to facilitate irrigation (Fig 504); the houses are in this way protected from flooding, which happens during winter, when water covers some areas to a depth of a metre or so, especially in badly drained hollows.

In recent years there has been a shift away from date production to vegetable growing, which has proved successful, and now the land around the date gardens is used extensively for this purpose. With the change in agricultural emphasis new houses are being built away from the older centres and nearer to the new fields.

As stated in the description of Buraimi's climate, there is a cooler microclimate down in the Oasis than in the surrounding desert, which encourages people to build within or as near to the oasis as possible to benefit from the cooler more comfortable climate (Fig 505).

5.3 House form and materials

Because of the hot dry climate, maximum use should be made of insulation from the exterior heat and for this reason the window openings in the Oasis are small, minimising the unprotected area of the wall. These small windows also help to reduce the amount of dust being blown into the house, although the palm trees also help to filter the air.

Four materials are used in the area; mud brick, concrete block, palm frond stems and corrugated iron. The use of mud brick is the same here as in the Northern Uplands (Section 4.3.2) and its climatic performance has been described in that section. Its insulation properties are even more valuable in this situation where the annual and diurnal range is greater. Concrete block has been shown in Section 3.3.2 (Response to climate comparison) to have a poor insulation performance. The use of the palm frond stem is limited here, and occurs mostly in roof construction as described in Section 4.3.2 (Construction methods).

At present the use of corrugated iron in the Buraimi Oasis is extensive, especially in the landlord owned part of the Suq, where a number of shops and stalls are constructed almost entirely with this material. Corrugated iron affords protection against rainfall, which is quite heavy at times during the winter. Furthermore it is quick and easy to erect, providing a shelter of sorts quite cheaply, but, being a thin sheet of metal, it immediately transfers the outside surface temperature to the interior (Fig 506), so that, with no time lag, 100% heat transfer and the build up of heat within the room, temperatures well in excess of any conceivable comfort level will be reached, with potential harm to the occupants and certainly creating unhealthy conditions for keeping any kind of fresh food in. It is also extremely unsightly. Its use should only really be considered in the absence of a better material or combination of materials within the financial range of the occupants, which is not the case here.