

conceptions of the world and life inherent today in Islam.

An interest may be inferred from the foregoing notes in going more deeply into a study of these techniques of water collection which appear in the Islamic world, in order to compare them with each other, to establish their origins and connections, and analyse their results.

A particularly worthwhile aspect could be consideration of the legal provisions regulating water distribution through a study of as yet unpublished manuscripts which can exist in Oman or in Spain.

NOTES

- ¹ Ibn Durayd, d. 933, *Jamhara al-luga*.
- ² Ibn Sida, d. 1066, *Al-Muhkam*.
- ³ Ibn Manẓūr, d. 1311.
- ⁴ Al-Zabīdī, d. 1791, *Taj al-'Arūs*.
- ⁵ Jaime Oliver Asín, *El Nombre de Madrid*, Consejo Superior de Investigaciones Científicas, Madrid, 1947.
- ⁶ Oliver Asín, *ibidem* (6 bis). Cf. Henri Goblot, *Les Qanats*, Mouton Editeur, Paris 1979.
- ⁷ Princeton University, 1980.
- ⁸ J. Vernet, *Estudios sobre la Historia de la Ciencia Medieval*, Barcelona-Bellaterra, 1979. Cf. Goblot, *op. cit.*: 74 ff.
- ⁹ Stacey International, London, 1978. Cf. Goblot, *op. cit.*: 103 ff.
- ¹⁰ J. Oliver Asín, *op. cit.*

The Origins of the *Aflāj* of Oman¹

J. C. Wilkinson

The traditional water supply of all the main settlements in Oman is ground-water. Surface flows from shallow resurgences in wadi gravels (*ghayl*) or from springs in the limestone massifs is often used to supplement the irrigation system and in the past was even brought from the mountains to some of the coastal settlements by means of wide, cemented canals. In some of the small villages in the upper reaches of the wadis surface flows or minor seepages from the volcanics (*hayl*) can form the only supply of water but in all the main settlements ground-water inevitably provides the basis of the irrigation system.

Hydrological conditions divide Oman into two major irrigation provinces, the mountainous interior with its semi-fossilized piedmont outwash fans and the Bāṭina coast. In the latter the water has to be lifted, traditionally by means of animal drawn hoist wells, generally known as *zigar* (= *zījar*; sing. *zījra*, also known as *jāzira* in northern dialects and, by synecdoche from the pulley cog at the top of the well, as *manjūr*). In the interior, on the other hand, wells are a complementary, although sometimes important, source of water supply, and there the irrigation system is almost exclusively based on the *qanāt*, a tunnelled horizontal well, characteristically up to ten kilometres long and drawing water from aquifers around twenty metres, although they may go up to three times deeper on occasion. With the exception of localized areas of karstified limestone their source of water is almost exclusively drainage in the semi-fossilized wadi system. Flow in this is very variable with high transmission rates being associated with pipes in the conglomerates in the upper reaches, and

buried channels which act like a gravel-packed field drain for the concentrated drainage downstream, where the main *aflāj* have their off-take. In these transmission rates may rise to nearly 1000 m²/day, some four times that of the surrounding conglomerate zone whose lower flow is tapped by wells. The fact that these old drainage lines are buried under 10–15 m of more recent fluvial detritus is indicative of the hydrological skills of the *falaj* builders in recognizing the hidden morphology of the wadi systems. It also indicates the need for specialized maintenance in the upper sections of the *aflāj* where velocities of 0.75 m/sec. may lead to collapse of the tunnel and where the buried drainage lines can shift both laterally and vertically, (Letts, 1979).

Upkeep of the underground section of the *falaj* therefore has two components, that of the lower tunnel where flow can be affected by tree roots, silting and collapse caused by floods, and that of the headwater section. The former is an almost continuous job and until recent times within the capacity of the village community: the latter requires specialist skills and may be very expensive.

The object of this paper, however, is not to develop these aspects of the physical and social structure of *falaj* organization but to try and reconstruct the history of *qanāt* building in Oman.

GENERAL IMPLICATIONS FOR AN EARLY IRANIAN ORIGIN

Two features of the social and physical structure are, nevertheless, highly relevant to our theme and provide important background information

Contributor's address

PROFESSOR F. UTRAY, Instituto Hispano-Arabe de Cultura, Paseo de Juan XXIII 5, Madrid Spain.

on which to build our thesis of a pre-Islamic Iranian origin.

The first concerns the requirements for the construction and maintenance of *qanāt* which at first sight may appear to fall within the capacity of a village community. In the Marrākesh *hawz* for example, Pascon (1975) estimates 300 digging days per litre-second (l/s) for constructing small *qanāt* producing less than 10 l/s, rising to 1000 days per l/s on the larger *qanāt* producing 20 l/s. Since 1 l/s is sufficient to support a household, an investment of 500 labour days (say three years of free time when not engaged in essential agricultural work already) is theoretically within the capacity of a family group, so that digging a small new *qanāt* might conceivably be carried out by a village community. Doubtless this is the case in shallow *falajs* in the upper reaches of the wadis or even in small cut-and-cover ones built at the other end of the wadi fan, and certainly I have come across local communities capable of resuscitating minor *qanāt* with little outside aid. But the main *aflāj* of the big villages in Oman are much more serious undertakings while the labour calculations cited above tell only part of the story. The other part is that the work is highly skilled and dangerous and for the main tunnel section can only be carried out by small teams working in relay. A full *qanāt* therefore takes many years to build and is the work of a very specialized *métier*. At the same time such investment in marginal land is only feasible when the costs of the work is low and physical and economic security high. So although building *qanāt* does not require the high mobilization of labour necessary for the development of a major canal irrigation system with a high ratio of dead to live channel (as on a major river system) or, indeed, for the maintenance of a major diversion dam with silting-up problems like Mārib, it does require strong government capable of securing the essential pre-conditions for investment and a wealthy *élite* prepared to provide the capital. Polybius description (x, 28) of how early *qanāt* were built long before the period he was writing about (end of third century BC) accords perfectly with these postulated conditions: 'they granted the enjoyment of the profits of the lands to the

inhabitants of some of the waterless districts for five generations on the condition of their bringing fresh water in'. Wittfogelian despotism harnessing a subject population (*harrātīn*, *bēghār*) can produce *qanāt* (*viz* the Sahara), but it is not conducive to the development of a professional corps like the *muqannis* (Goblot, 1979) and it is certainly not a pre-condition for such investment in the land. Security, on the other hand, is, and the sort of work involved in developing a full *qanāt* network can only come from government sponsored organization or from an urban society which has the economic incentive to do so. But strong government does not necessarily argue major imperial power and it is here that a number of authors, including formerly the present writer, have fallen into the error of assuming that if there was a major extension of *qanāt* building in Persia it could not pre-date the Achaemanid period. In fact this is fallacious *a priori* argument and the physical evidence, including that from Oman as we shall see below, indicates important initial development in the pre-Achaemanid period. In the same way the early development of major canal irrigation systems on rivers which have generally tended to be associated with the sorts of development in imperial power that occurred in the Iron Age (Sherratt, 1980) is proving false, for the evidence from Bactriana indicates construction as far back as the third millennium (Gardin & Lyonnet, 1978/9). Nevertheless one must not exaggerate in the other direction for the kinds of administrative structures evolved by a Darius I or a Kisra Anūshiravān obviously played a major role in the extension of agricultural settlement. Again, some *qanāt*, like the extraordinary ones at Gonabad which drew water from nearly 300 m, must have been conceived more in the nature of a display rather than an economic venture. It is as much a mistake to think that power is shown off only in palaces as it is to measure investment on the land only in terms of economic return.

The maintenance of *qanāt* is quite a different matter. Here the village community can cope very largely both with the short term and long term upkeep required. True, periodic extension in the upper reaches of the *qanāt* requires the

outside skills of the water diviner (*bāṣir*) and the expertise in working the head water areas which the 'Awāmir possess (Birks & Letts, 1976), but this can be financed by the community whilst the security may be adequately provided by conventions limiting the use of *aflāj* in warfare to cutting the water supply to a community and, *in extremis*, cutting down palms (*cf.* discussion of these principles in *Sīyat al-Barāra* written c. 510/1116 by the author of the *Muṣannaḥ*, Aḥmad b. 'Abdullāh al-Kindi; also J. C. Wilkinson 1977: 98). On the other hand we should recognize that weak central government is not conducive to the proper upkeep of *qanāt* for there are occasions, notably after a major disaster, when the local community is incapable of harnessing the resources necessary to restore damage. The kinds of *falaj* organization that exist in Oman are also unlikely, without outside help, to carry out the long term maintenance required except where they have the particularly strong institutional structure which does exist on some of the largest *aflāj* or unless power is concentrated in the hands of a particular family, what Spooner (1974) in his study of a small *qanāt* settlement in eastern Iran calls the 'dynastic family'. There, as in Oman, the danger comes when there is a major disaster for this cannot be made good without the intervention of some central authority capable of providing the funds without considering the cost in terms of short, or even medium term, economic return, which the landlord normally does. The enormous decrease in the cultivated area in Oman during Nabāhina times (roughly end of the twelfth to early seventeenth century) was probably due more to their failure to help local communities in periods of disaster as it was to any malicious damage caused by wars and local fighting.

In the short term therefore, it can be seen that village-cum-tribal organization is adequate for maintenance of a *qanāt* irrigation system; in the long term more centralized power is necessary. The latter has only occurred extensively in interior Oman until recent times during the First Imamate of the ninth century, short periods of the Second Imamate in the eleventh and twelfth centuries, perhaps the odd moment in Nabāhina times, the main period of the Ya'ariba Imamate

and possibly at the beginning of Āl Bū Sa'īd rule, as also of the restored Imamate in the twentieth century.

The second preliminary point to note is that Oman has specialized in ground-water technology although there is considerable potential for exploiting surface flows. By contrast the western side of the Arabian peninsula, from roughly Ḥaḍramūt round to al-Shām (Greater Syria), has been a zone where the early forms of irrigation are based on surface flows, what is known as 'run-off farming' of various types. True, *qanāt* do exist there, and some of them may even go back to the Lihyanite period, more-or-less contemporary with that of the Achaemanids (Nasif, 1980): those in the Layla-Kharj area may be Hellenistic (Zarins, Ibrahim, Potts & Edens, 1979). In the Sasanid period there was probably fairly extensive development either under direct or indirect Persian influence for this was a period when there was a major interaction between the western and eastern worlds. Wells were also used, whilst tunnelling to gain access to underground reservoirs or to open up springs has a long history in this zone (*e.g.* Yadin, 1975). But it was not an area of major innovation and diffusion of ground water technology. By contrast it was in surface flows.

The history of spreading and yield improvement of natural surface flows is, of course, very ancient. Indeed, if we follow the argument of Sherratt (1980) small scale water spreading technology was likely to have been the earliest form of irrigation development whilst in more marginal environments ephemeral flows would have been captured by minor diversionary devices and boulder walls behind which silt can be trapped and water stored in the soil. Such techniques had a wide early diffusion ranging from Baluchistan, where 'gabarbands' have been in use since at least the third millennium (Raikes, 1964/5), to the Tunisian Sahel where 'masqaṭs' first seem to have appeared in the mid-second millennium (Tixeront, 1959). Of particular interest for Oman is the fact that evidence from the Tepe Yahya area, which was closely related to early developments in Oman (see below), utilized such seasonal floods (*salaiba*, *sayl*) as far back as the late

fifth millennium (Prickett, 1979): it is clear from the very siting of third millennium sites in Oman, and now quite specifically from discoveries in Maysar, where a bund has been found, that the pre-*qanāt* civilizations in Oman used such techniques along with wells (Weisgerber, 1980a: 96-7). In this connection it is also worth noting that between 9000 and 6000 BP the Intertropical Convergence Zone (ITCZ) lay 10° north of its modern position and that tropical monsoon rainfall would have, in some degree, occurred more extensively in western Arabia as well as Oman and southern Persia (for details see Roberts, in press). The tail end of this more humid phase (extending perhaps to 4000 BP; Zarins *et al.*, 1979) with perhaps a bi-modal distribution of rainfall would almost certainly have affected the early civilizations of Oman and made run-off a more reliable source of water accumulation than at present.

Such 'run-off' techniques however, were relatively simple. In the specialist 'flood generating zone' they were developed from the second millennium onwards (Parr, Harding & Dayton, 1968/9) to cover a large variety of environments. Without going to the extremes of Pirenne (1977) with her Wittfogelian empires of dew collecting monuments, one cannot but be struck by the development of diversionary dams into as spectacular monuments as Mārib, by the surface treatment of micro-catchments capable of permitting permanent settlements in areas of rainfall as low as 80 mm p.a. (Evenari, Shanan & Tadmor, 1971), and by the enormous development of terracing which, in the Yemen, may go back to the earliest centuries of the Christian era (van Beek, 1967). Such techniques also led to the development of historical complexes with a long evolutionary history such as Jawa (Roberts, 1977), the tanks of Aden (Norris & Penhey, 1955) and the dams of the Ḥijāz (Kay, 1978). It was with the manipulation of surface water too that the Arabs themselves were most familiar and in their early days were certainly responsible for developing springs and dams in their home area (El-Ali, 1959; Makki, 1979), and restoring run-off systems largely abandoned as a result of decline in the third century AD (Sauvaget, 1967; Sperber, 1972).

This specialized western technology could also have been applied in the Iranian domain and would have certainly been appropriate in the Oman environment. Vestiges of old technology at a fairly simple level did survive alongside the ground water specialization (*e.g.* in Baluchistan until the present, (Scholz, 1978); in Kharg island in the Sasanid period (Ghirshman, 1960), whilst terracing has been used on the edge of the Jabal al-Akhḍar plateau in Oman to exploit the springs there), but the main pre-Islamic Persian developments concentrated either on the development of canals and weir systems on major rivers (Mesopotamia, Bactriana), or ground water exploited through gravity flow by the tunnelled *qanāt*, or by lift through various rotary devices or the *zijra* type well (Laessøe, 1953).

So on technological grounds Oman seems to fall into the province of the Old Iranian expertise (*handasa*, *cf.* Mazahari, 1973): that it also falls into its zone of primary or early diffusion is probable by reason of its geographical proximity and by the close association of the two areas in pre-Islamic times.

INDICATIONS OF A TECHNOLOGICAL 'DISCONFORMITY' BETWEEN THE PAST AND PRESENT IN OMAN

The last indirect evidence pointing to a pre-Islamic Iranian origin for the *qanāt* of Oman is that whilst the technique is well suited to its hydrological environment, there are a number of anomalies between the traditional use of water and the kind of expertise and social organization one might expect from an indigenous society that had created such an irrigation system. The chief of these are as follows.

(1) The tenure system of small tribal *mulk* holders (free-holders) in central Oman, is paradoxical: such a form of landownership represents almost the opposite extreme to the type of land organization one would expect from a society that had constructed *qanāt*. Similarly the traditional political administration in interior Oman is not suited to such an irrigation system. There the Ibāḍī idea of state is little more than a religious transformation of

tribal organization (J. C. Wilkinson, 1976a), and is opposed to centralised administration and to the concentration of power in the hands of the few: since this encourages neither bureaucratic administration of the country's wealth, nor capitalist tenure, major investment in Oman's economic infrastructure would hardly be expected in normal circumstances.

(2) The present population of Oman has no real knowledge of the techniques of *qanāt* building. The 'Awāmir are the *falaj* experts, but their expertise is confined to working the upper sections of existing *aflāj*. Although they may have built the occasional small *qanāt* they have little knowledge of the surveying methods and specialized constructional techniques possessed by the *muqannis* of Persia (*cf.* also Birks & Letts, 1976).

(3) The local population is completely ignorant of the history of *qanāt*: they are *shē mubhim*, something unknown, 'and Allāh, from God. The answer to the query about who built them is either the Furūs (Persians) or more usually *Sulaymān b. Dawūd* (Da'ūd), Solomon son of David. This, at first sight, is not very helpful, for in many parts of the Arab world any great work of antiquity is attributed to the supernatural powers of this legendary King Solomon, one of the four great world rulers and a true believer, according to the Islamic traditions.

(4) Omanis do not even distinguish between their various types of irrigation system. For them a *qanāt*, like any source of running water, is a *falaj* (hence the interchangeability with the term *anhār* in legal texts) and, parallel with basic Islamic law, is treated as a natural flow (*cf.* rules concerning *kaḏā'im*). The preoccupation is with fair distribution of this God-given source of water. Indeed, in Semitic languages the root *flj* and its cognate *plg* is essentially concerned with the sense of dividing/sharing and only secondarily as meaning a water course: the connotation of the latter, therefore, is that it is a distributory system for sharing out water to those who have established an interest in it. Fair dealings

take priority over upkeep whilst similar attitudes are to be observed in the principles which control traditional government administration of the land where the human interest takes priority over the economic. (*cf.* J. C. Wilkinson, 1977, chapter vii).

In other words, there is clearly a disconformity between the socio-political system of land exploitation during the phase of construction and that of the traditional use of Oman's irrigation systems. The possibility that the present population acquired them from some other society therefore suggests itself. This possibility becomes a near certainty if one studies in detail both the terminology and arrangement of existing land and work organization where it will be found that, for example, vestiges of the earlier systems still tend to remain as the basis for primary water rotation rights (*cf.* the very word *ād* which survives on some *aflāj*) or the work organization of the *bayādīr* (singular *bīdār*), even though in Ibāḍī Oman the original system of a landless agricultural labour class has long since disappeared, as too notions of its social inferiority (J. C. Wilkinson, 1974). Space, however, does not permit discussion of such detail and here one can only concentrate on the main features which push us back into the *jāhili* period for finding the origins of the Omani *falaj* system.

EVIDENCE FROM THE ISLAMIC PERIOD

Specific evidence apart, there are a number of reasons why one is forced back to pre-Islamic times in order to discover when the *qanāt* system of Oman was built. In the first place a study of the places mentioned in the early sources shows that the names of virtually all the main settlements (many of which are probably arabizations of older names) have featured by the time of the civil war at the end of the ninth century, and that many occur in connection with even earlier events. Since a large number of these places can only exist by reason of the *qanāt*, this of itself suggests that the irrigation network must have been more or less established at least by early Islamic times. In addition, there are hints that at

that time the irrigated area was far more extensive than it is now (air photographs certainly confirm that a major decrease in the area cultivated by *qanāt* irrigation has occurred at some time or other). One reads, for example, that during the Imamate of Ghassān b. 'Abdullāh (192/808–207/823) Nizwā 'was so fertile . . . its water so plentiful that it was said the old Falaj Dawt extended as far as Dāris land' (al-Sālimī, *Tuhfa* i: 125). In contrast, history and local tradition speak only of destruction of settlement in the centuries following.

Then there is the fact that the historical sources provide no evidence of a major period of *qanāt* construction within Islamic times (except for the Ya'āribā period – see below), even though they have plenty to say about the destruction of *aflāj*. This evidence should not be considered as simply negative, for a closer examination of the sources will confirm that the occasions when large-scale land developments could have occurred during the last thirteen hundred years are extremely limited, and that such investment as did in fact take place largely consisted in restoring the ravages of the past rather than in building anew.

There is a distinct pattern in the history of Oman such that the Islamic period may be divided into two major and a number of minor 'Imamate cycles'. Briefly this works as follows. At the height of the cycle the people are united under a strong Imam, the Omanis profit from control of their coast, and the benefits of overseas trade feed into the country's economic system. Some of this wealth is invested in the land, but in such a way that capitalist land-tenure develops whilst simultaneously Imamate government declines into dynastic rule. So the ideological basis of the Ibāḍī Imamate weakens and competition for control of power and wealth grows: and as it does so, tribal factionalism revives (it may even lead to full-scale civil war in a major Imamate cycle, as at the end of the First and Ya'āribā Imamates in the ninth and eighteenth centuries, thereby undoing much of the constructive work of the previous period) and the central authority of the Imam finally collapses to be replaced by the rule of local pseudo-Imams or *mulūk* who are incapable of holding the state

together. Thus divided the Omanis lose control of their maritime trade, the economy of their villages declines, and outsiders begin to take possession of their land. Not until they have sufficiently 'quaffed the draught of terror, and suffered from the general destruction which encompasses religion, property and life' does the Ibāḍī ideology dormant in the central core of the country slowly reawaken and inspire the tribesmen once again to give their support to an Imam capable of re-establishing strong government.

So it can be seen that only at the height of the Imamate cycle do conditions favourable to major land development exist, while at other times destruction rather than construction tends to be the order of the day. There are therefore only two periods in Islamic history that need seriously be considered as possible epochs for really extensive *qanāt* building.

THE FIRST IMAMATE AND ITS AFTERMATH

The first is the 'Golden Age' of the First Imamate (ninth century). Here the striking feature is that although there is evidence that this was a period when the Arabs developed a major new land organization and *falaj* rulings first began to feature in the records, there is no mention at all in the fairly detailed historical and *fiqh* material of any *qanāt* construction. On the contrary, virtually all the rulings from the very detailed legal records we have of this period (cf. J. C. Wilkinson, 1976b; 1978b) are concerned with problems about repairs and upkeep, whilst the social problems tend to deal with contractual relationships between owners and tenants. I have only come across the odd reference to forming new partnerships and in each case these referred to the redevelopment of *ramm*, that is previously exploited land that has been abandoned, and never to construction of a new *falaj*. In addition, specific evidence from certain early rulings support the vestigial evidence (such as the names of early shareholders in the irrigation systems that have survived in the names of rotation periods on *falaj dawrāns*) to show that in the First Imamate many of the actual occupants of the land

were still either 'Persians' of a client status or *majūs dhimmis* (protected people of the old Iranian religion). This in turn reinforces the argument that the Arabs had somehow gained possession of the land from an original Iranian dominated society and had still not fully assimilated them. In other words the traditional land organization of Oman was in the making but still not completed at this stage.

On the other hand, this does not mean that no *qanāt* building occurred, for there may well have been some *muqannis* left in Oman at this time, while clearly some important restoration work did take place to make good the neglect of the preceding Julandā period (J. C. Wilkinson, 1975). But the only positive evidence concerning a major extension of the cultivated area comes from the Ṣuḥār area, a rather special case because even though this port did prosper during the First Imamate (J. C. Wilkinson, 1979), its major development occurred during the period of foreign (largely Persianized) domination which followed the collapse of the Imamate.

The extraordinary flourishing of Ṣuḥār in the tenth century, which was coupled to a huge expansion of copper production in the mountains behind (Weisgerber, 1980b), incited a major development of water supply and agriculture there. Williamson (1973) estimates the intensively cultivated area around Ṣuḥār as covering 61 km², that is some four times the present area which is confined to the littoral strip. This extension was achieved by means of extending the well system which had to be sunk to an increasing depth the further inland the cultivation extended: at its limit the *zīgar* wells seem to have been tapping the water table at 16 m (T. J. Wilkinson, 1975). Further supply came from a long open channel drawing water from *ghayl* storage in the gravels upstream of a constriction in the Wādī al-Jizzi some 35 km from the coast incorporating both an inverted siphon and a series of four water mills (T. J. Wilkinson, 1976; 1977). This is definitely datable to the period of Ṣuḥār's great prosperity and Mr Tony Wilkinson (1980) is of the opinion that a similar open *falaj* running from the *ghayl* (surface and sub-surface flows in the superficial gravels) at al-Khawḍ in the Wādī Sumā'il to the

Sīb area and incorporating six mills also dates to this period. However, we should note that this *falaj* runs to the ancient site of Damā which was a major fortified centre from Sasanid times until Oman's Dark Ages (although it was badly damaged in a flood in the middle of the ninth century), whilst a similar open *falaj* runs to the coast in the plain to the east of Ra's al-Khayma, a site about which there is much legendary history concerning pre-Islamic times (cf. J. C. Wilkinson, 1964 for details): I know nothing of the history of the fourth major open channel which runs to the Na'mān area of Barkā, reputedly rising near 'Ifī in the Wādī Banī Ma'āwil, except that it too has very old associations and as with the other channels was definitely not the original work of the Ya'āribā (evidence in T. J. Wilkinson, 1980), although they may have attempted to restore them. So whilst it is quite possible that these open channels do all belong to the same period of expansion on the coast of Oman associated with Ṣuḥār's great period of prosperity from the end of the ninth to the middle of the eleventh centuries they are, nevertheless, associated with more ancient sites: it is not to be excluded that they may in part be Sasanid for the techniques of building such channels along with the associated inverted siphons and water mills were in use by them (Adams, 1962; Neely, 1974).

However that may be, the gain in the cultivated area was rapidly lost in the ensuing period and in the Middle Ages one can trace the abandonment of settlement all along the coast from the principal centres around the Musandam peninsula, Julfār, Dibā, Liwā, and down the Bāṭina coast from Ṣuḥār to Damā. Although there were minor periods of recovery this land was legally sterilized and it was not until Ya'āribā times that it was really redeveloped. Small additions to the cultivated area in south-east Oman, which became the main area involved in maritime trade from the thirteenth century onwards, by no means made up for these losses. Nor did these periods of coastal prosperity affect interior Oman which was more or less isolated from the coast after the collapse of the First Imamate and underwent incalculable loss to her

irrigation system in the civil war which ended the First Imamate in the last decade of the ninth century. This saw a massive destruction of *aflāj*, notably in the Jawf, that is the area of central Oman on the inner side of the Jabal al-Akhḍar. In Izkī the famous Falaj Malki complex was reputedly reduced from 120 branches to two (al-Sālimī, *Tuḥfa* i: 262) while further out into the plain there was a major abandonment of settlement. Subsequent political disturbances and illegal seizure of land led to even more irrigation being abandoned, notably in the Bahlā area, around Salūt (near Bisya), at Jumāḥ (Jabrīn area), Ajrad and Sayfam: subsequent legal rulings declared this land *māl ḥashrīya* so that, as on the Bātina coast, it became untouchable (cf. chapter 21 of the *Kitāb Khuzānat al-'Ubbād* of Aḥmad b. Maddād of the mid-sixteenth century for details).

THE YA'ĀRIBA

The second potential *qanāt*-building period that must be considered is at the height of the Ya'āriba Imamate, notably under the rulership of Sulṭān b. Sayf I and his sons Bal'arab and Sayf between 1649 and 1711. Here the evidence needs examining rather more closely, for it is certain from both the written record and the spoken tradition that considerable land-development did occur at this time. Amongst the works that we know were carried out was an extensive redevelopment of the Bātina, the rebuilding of numerous *aflāj*, and the reconstruction of Ibrā(?), Birkat al-Mawz, and al-Ḥamrā.² Agricultural efficiency was raised by helping the villages reorganize the distributional and maintenance system of the *aflāj* and by the introduction of new crops (and apiculture), as a result of increasing Omani contact overseas in the Indian Ocean towards India, East Africa and also Yemen, which seems to have been an important source of ecologically suitable crops.³ The Ya'āriba themselves invested heavily in the land and from Sulṭān b. Sayf's time had deliberately pursued a policy of participating with local groups in their reconstruction work, thereby obtaining not only tribal influence but important holdings in a number of the main centres in the

interior. But this policy reached extremes under Sayf b. Sulṭān who turned much of his home area around Rustāq and its local port of Barkā into a personal fief; so rich did his land holdings become that it was said that he owned a third of the water rights in Oman. It was this blurring of the distinction between personal and state property and the increasingly capitalist forms of land exploitation of his rule which gave rise to Sayf's title of *Qayd al-Arḍ* and symbolised the ultimate decline of Imamate into dynastic power amongst the Ya'āriba, a shift which was to lead inevitably to civil war. But of itself it was a period of enormous prosperity for the land and at last the old legal sterilizations declaring the abandoned land of the previous centuries *māl ḥashrīya* were lifted through a more flexible approach to interpretation of the basic underlying principles (cf. J. C. Wilkinson, 1977; Appendix). It was not only the Ya'āriba who re-developed it but merchants and leading personalities of the state, people like Ḥimyar b. Munīr al-Nabhāni who rebuilt the *Qasawāt falaj* at Izkī. Similarly the general prosperity of the land led to an increase in the process of sedentarization and many groups of the bedu fringe began to enter into association with skilled local groups to re-exploit abandoned *aflāj* all the way from Zāhira (e.g. the Āl Bū Shāmis villages or the Aflāj Banī Qitab) to the Wahība settlements on the fringes of the Sharqīya and Badīya. Amongst the groups to do so were 'Awāmir who began to develop the major deserted settlements downstream of Izkī, the Buldān al-'Awāmir. It was the skills they acquired in the process that gave them the reputation of being the leading experts to work in the headwaters of *qanāt*; but it should be noted it was not the bedu themselves who carried out the work but local settled populations who had retained vestiges of the old traditions and became assimilated into the 'Awāmir tribal structure. The 'Awāmir, as too other small groups skilled in *falaj* reconstruction, also played a role in redeveloping other areas, notably in the Sīb area (abandoned Damā settlement) and they may even have built a few new simple *aflāj* later for the Āl Bū Sa'īd, including possibly Bayt al-Falaj.

But the essential thing to note about the

Ya'āriba was that their's was primarily reconstruction work. If we look at the list of seventeen or so *qanāt* which Sayf b. Sulṭān had work done on, we will see that, apart from possible new construction in the Ja'lān, they are nearly all famous old *aflāj* like al-Bizayli or al-Ṣa'ighi: furthermore the earliest source for this list, Abu Sulaymān Muḥammad b. Rāshid al-Ma'wali (second half of the eighteenth century), quite specifically uses the word 'renew' to describe his work (*Nubdhā*: 432). Again the construction that Sayf's brother, Bal'arab carried out in the Zāhira and Bahlā area was all built on previously irrigated land, including the magnificent fort of Jabrīn. True Ya'āriba irrigation work often involved modifying the original designs of the *aflāj*, making use notably of tanks to increase the discharge rate of low-flow *qanāt* (e.g. in the Jabal al-Akhḍar plateau settlements or the now re-abandoned al-Sihāma *falaj* on the Najd al-Maghbarīya) and of inverted siphons to cross obstructions, thereby extending the use of this particular technique which, as we shall see later, was originally more or less confined to the Ghadaf (that is the outer coastal side of the Jabal al-Akhḍar, the Rustāq area: cf. the Jawf, the inner side, where inverted siphons are rare). Again, the three major settlements they rebuilt in the interior (Ḥamrā, Birkat al-Mawz, and perhaps part of Ibrā) show some architectural features novel to Oman, and there is no doubt that they, as too possibly the early Āl Bū Sa'īd, used imported craftsmen for irrigation works as well as for constructing forts and other major buildings. The Ya'āriba also had some ambitious new projects for the centres they redeveloped which would certainly have introduced new agricultural settlement: such, for example, their plan to divert *ghayl* flow into the plain in the Ḥazm area which was also to be linked to the coast by a ship canal.⁴ But of the realized economic schemes the work was nearly always of renewal or improvement to existing organization, whether in the re-opening of mining abandoned since the Middle Ages, the reconstruction of ancient *qanāt*, the extension of the crop basis and the reorganization of *falaj* distribution systems. Such was the low that Oman had fallen into in the previous half

millennium that there was too much to do restoring the ancient heritage before launching into extending the cultivated area. Such new colonization that they did realize was probably concentrated on the south-east, where the Āl Bū Sa'īd may later also have been responsible for some new work. It is probable, for example, that the extraordinary Ḥayl falaj, incorporating quite new principles to Oman of water flow by linked siphons, belongs to this period, as too some of the now abandoned settlements near al-Bawshar.

Thus, remarkable as the work of the Ya'āriba was, it is not possible to attribute any major part of the basic settlement pattern in Oman to their efforts, but only a revitalization of the land after the all-time low into which the country's economy had sunk by the end of Nabāhina times.

So from evidence of the Islamic age itself, the *jāhili* period presents itself as the epoch when the main settlement pattern of Oman must have developed. Fortunately the surviving vestiges of the history of this 'age of ignorance' do provide some positive support for the thesis that the main land development of Oman was completed by the middle of the seventh century AD.

THE EARLIEST AFLĀJ

Written Omani history begins with an account of how the first Arab tribes came to the area. It tells of the way clans of the Mālik b. Fahm Azd, accompanied by some so-called Quḍā'a groups, left the Sarāt and the Tihāma (in south-west Arabia) and migrated along the settled fringes of southern Arabia to arrive in Oman. This story forms a part of the legend of the Azd diaspora which began when the Sayl al-Aram, the flood which reputedly burst the Mārib dam, caused the Azd to move away by major genealogical groupings from their homeland, first into western Arabia (from the Ḥijāz to Sarāt) and then, in the course of time, further afield into the Arabian peninsula until they reached the fringes of the Fertile Crescent.

Now the Mārib part of this story can be proved sheer nonsense (von Wissmann, 1964), part of a deliberate piece of historical manipulation which

seeks to identify the rulers of Old South Arabia with the Qaḥṭāni tribes through legends about Mārib: there does, nevertheless, appear to have been a period of active, though intermittent, migration of Arab tribes away from south-west Arabia which may not be entirely unrelated to shifts in the organization of civilizations associated with Mārib. Over the centuries these tribes followed three main routes in their dispersal: northwards towards al-Shām (Greater Syria) and Iraq, eastwards through central Arabia (al-Yamāma) to eastern Arabia (classical al-Baḥrayn) and south-eastwards along the settled fringe of southern Arabia to Oman. These major routes of migration were like three streams which, issuing from a tribal spring in the western part of the peninsula, flowed their separate ways across the deserts of Arabia to rejoin in a whirl of complex cross-currents on the fringes of the settled areas of the Gulf and the Fertile Crescent.

Thus the local story of how some of the Azdi Mālik b. Fahm clans migrated to Oman forms part of a complex history of tribal movement in which the factual elements have been expanded, compressed, personalized, transferred, and manipulated, and the whole embellished with a generous dose of legend. Nevertheless, once this story is stripped of its legendary overlay and the various strands of history unravelled, it does say something about how the first real Arab tribes came to Oman, and it does, by chance, contribute some interesting clues to the history of *qanāt* there. This basic story is as follows.

The Arab new-comers first began to make their new homeland in south-east Oman, in the Ja'lān and on the coast around the Qalhāt area, (that is, on the outer fringers of settled Oman, away from the main maritime centres of the time, and in a region that had scarcely been settled, if at all). Soon, however, the Arabs began to penetrate into the Jawf, (that is central Oman on the inner side of the mountains), which led them into direct conflict with the Persians who were the 'people' of the country and who recognized 'Dārā b. Dārā b. Bahmān' as their suzerain (*Kashf* MS 31). The Arab demands for a grant of territory with water and pasture were turned down, and the Persians joined battle with the new-

comers near Salūt (downstream of Bahlā). The Persians were defeated and a truce was concluded, the terms of which appear to have been that the Persian forces should retire to the coastal regions and evacuate Oman within a year. The chronicles relate that in the time of grace accorded them, the Persians deliberately laid waste the land, destroying large numbers of *aflāj*, of which 'Sulaymān b. Dawūd had constructed 10,000 in Oman.' While this evacuation was in progress the Persian King sent reinforcements: the Arabs, anticipating a new attack, struck first, and drove the Persians right out of their territory which the Arabs then proceeded to pillage. Following this victory, large numbers of Azd groups and other tribes started to arrive in Oman ('Awtabi Paris MS 254^r-258^r and Johnstone MS 187^r-191^r; *Kashf* MS 34).

So runs the local story, and once again towards the end, as at the beginning, the time scale has been enormously compressed. While it is true that the first identifiably 'Arab' migrants to Oman did establish themselves in the western desert borderlands in pre-Sasanid times (possibly in the first or second centuries AD), their final success in taking control of all Mazūn (the Sasanid name for Oman) did not occur until the middle of the seventh century AD, while Azd migration into the region continued at least until well into the eighth century. But having made allowances for such distortions, this story is most revealing about *qanāt*, first because it shows clearly that when the Arabs *qua* Arabs began to arrive in Oman some form of *qanāt* network already existed there, and secondly because it provides two indications that this had been developed in much earlier times.

The first of these indications is contained in the statement than when Mālik b. Fahm came to Oman the land belonged to Dārā b. Dārā b. Bahmān. This statement, of course, needs interpretation. In the first place there was no such person as Dārā b. Dārā b. Bahmān: the name represents a conflation of the two great Achaemenids, Darius I and III with a Sasanid eponym and derives from Sasanid legendary history concerning Iran before Alexander. In the same way Mālik b. Fahm is a conflated figure

vital for rationalizing early Arab history. Apart from his limited role as leader of the first Azd migration to Oman he has been manipulated by Ibn al-Kalbi in his fundamental formulation of Arab genealogy to weld the Azd and Quḍā'a into a single genealogical grouping through the Tanūkh migration. In addition he is a key figure in the legerdemain by which the Arabs have assimilated as their forebears many of the early inhabitants of the peninsula, and in particular the peoples of the Old South Arabian civilizations. Such peoples were associated with Oman long before the first 'Arab' migrations arrived there, as is apparent both from their folklore and literary clues concerned with northern Oman (Thomas, 1929; J. C. Wilkinson, 1964). But this rather tendentious evidence is now confirmed by archaeological evidence.

From a site at Milayḥa in Sharja territory I was shown in 1970 by the then ruler, a gravestone uncovered in a bulldozer scrape. Professor A. F. L. Beeston's comment on my copy of the inscription was that it was undoubtedly Old South Arabian (OSA) and palaeographically datable to the fifth century BC or perhaps a little later. My own investigations into the alabaster double 'lamp?' specimen found at the same time shows it identical to a piece found in Palestine and dated to the third century BC or somewhat earlier (details given in J. C. Wilkinson 1977: 135, fn 6) and this dating as well as a 'western' provenance is now confirmed by an Iraqi archaeological team which shows the site as dominantly Hellenistic (Madhloom/Mazlūm, 1974; 1975). The Iraqis however, make no mention in their reports of OSA connections and seem to be unaware of the gravestone evidence.

Whilst therefore the Tāwī Milayḥa site is itself not OSA it clearly indicates a link between the interior of the Oman peninsula and the civilizations to which Mālik b. Fahm's name has been attached going back up to four or five hundred years before his migration actually arrived in Oman. Thus we can see that in the same way as almost a millennium of Persian history has been compressed in the figure of Dārā b. Dārā b. Bahmān so has a similar period of Arabian peninsular history been conflated in the Mālik b. Fahm

stories.

The second indication of an early development of *qanāt* in Oman lies in the statement that during the truce with Mālik b. Fahm, the Persians destroyed many of the 10,000 *aflāj/anhār* that Sulaymān b. Dawūd had constructed. 'Awtabi, writing around the turn of the eleventh to twelfth centuries AD expands this legend (Paris MS 260, Johnstone MS 192^v). The story he relates is that one day Sulaymān b. Dawūd was being carried by the winds on his daily trip from Iṣṭakhr to Bayt al-Muqaddas. On his way he was blown across to Oman where he saw a castle, seemingly only just constructed: this castle was at Salūt according to one version of the story. Sulaymān ordered the spirits to investigate. They reported that its sole occupant was an eagle who said that he and his forebears had been living there for generations (800 years in one variant of the story), and all that time the castle had been thus uninhabited. Then Sulaymān entered Oman, 'and at that time there were only nomads (*bādīya*) living there'. He stayed ten days, on each of which he ordered his spirits (*shayāṭīn*) to dig a thousand *nahr* (*qanāt*): hence the ten thousand *aflāj* of Oman.

This apparent nonsense deserves a little more attention than it might seem to merit at first sight. It is, after all, a story concerned with a very remote past, and events are almost certain to have acquired a mythical embellishment in their transmission. In fact, once the significance of the Sulaymān b. Dawūd story is elucidated this legendary history matches almost uncannily the archaeological evidence.

Sulaymān is the hypostasis of King Solomon whose connection with the Queen of the 'Sabaean' kingdom is celebrated. In Persia he tends to be partially identified with the even more legendary Jamshīd; thus in folklore it was this Jamshīd-cum-Sulaymān, and not the Achaemenids, who built Persepolis (*cf.* Takht-i-Sulaymān, Takht-i-Jamshīd). This is significant in the Oman context because when Sulaymān visited Oman and ordered the *qanāt* to be built, he was on his daily journey from Iṣṭakhr, that is the Achaemenid capital of Persepolis, to Bayt al-Muqaddas, or Jerusalem, the city of the real King

Solomon. The place where Sulaymān stayed was Salūt, that is, the same place that the first Arab migrants and the Persians were later to do battle.

The significance of the general story therefore, is that when the *qanāt*-digging civilization arrived in Oman from Persia, they found the place was only occupied by nomads although there remained buildings from an earlier civilization. In fact interior Oman must have appeared an extraordinary place at that time, a sort of abandoned film set. In the third millennium Oman had developed a remarkable culture which, whatever its origins, had begun to develop its own regional characteristics by the end of that millennium. But early on in the second millennium there was an abandonment of sedentary life, possibly due to the development of nomadism based on the camel (Cleuziou, in press; Ripinsky, 1975). In Oman, as on the Persian plateau, there was an almost complete abandonment of urban life and it was not until the final quarter of the second millennium in northern Persia, and perhaps around the turn of the first millennium in the south and in Oman, that a new civilization appears: closely linked to developments in southern Iran this civilization began to develop strongly in Oman after about 800 BC (Dyson, 1973; Lamberg-Karlovsky, 1973; Salman in Madhloom, 1974; Frifelt, 1975; Cleuziou, Pottier & Salles, 1978; Lombard, 1979).

It is to be noted that whilst the Iron Age peoples settled more or less in the same places as the older civilizations, there was a distinct shift in the location, with the new sites perhaps related to the development of *qanāt* settlement rather than the well/*gabarbānd* irrigation pattern of the previous eras. Dr Weisgerber (1980a and in discussion) has pointed to the displacement of roughly one and a half kilometres from his early Maysar 3 grave site to Maysar 8, which is a relatively small Iron Age graveyard dating perhaps to around 600 BC located close to the present small *qanāt* settlement of al-Maysar, and of his large Maysar 9 graveyard, dating around 300 BC, located near the major *qanāt* settlements of Samad. His Lizq fort, above the *qanāt* village of the same name, dates to the early first millennium and has no signs of earlier settlement. In the

Buraymī oases in the Wādī Bahlā and in the Bāt area there are similar displacements of the Iron Age sites relative to the earlier civilizations.

The evidence from the Omani legendary history about Salūt also turns out to be important. When in Oman in February 1973 I went to see if I could trace any evidence on the ground which might indicate why this place was the focal point for the history of the early Persian period. On explaining the purpose of my visit the Shaykh of nearby al-Bisyā immediately took me to a sizeable mound which he said had been the Persian fortress and pointed to the burial mounds on the surrounding high ground as 'Mālik b. Fahm graves'. The visiting Harvard team of archaeologists from Tepe Yahya to whom I showed the site confirmed its importance (they subsequently numbered it BB/15) and from the material they collected (which closely related to pottery types from southern Iran) dated its occupation from the turn of the eighth/seventh century BC down to the end of the millennium, with a minor reoccupation of the fortress mound around the thirteenth to fourteenth century AD (Humphries, 1974; for the latter period see Whitcomb, 1975). The coincidence with the Omani history is quite remarkable and the two sets of evidence between them tend to indicate that Salūt was a major fortified Persian centre for colonization in central Oman, abandoned when the Arabs took control over what was then settled Oman, in Parthian times. Furthermore, the evidence from the *fiqh* (jurisprudence) literature helps explain this later occupation in the Nabhāni period, for we know that Salūt remained an important settlement during the First Imamate but that the land of much of the Wādī Bahlā was illegally appropriated, possibly by the *mulūk* of Bahlā, with the weakening of Imamate power in the later eleventh century: as a result the *Bayān al-Shar'* declares it, along with its produce as untouchable by true believers. A ruling by Šāliḥ b. Waḍḍāḥ al-Manḥi (d. 1471) condones an attempt to recolonize Salūt, but in the next century and a half the *'ulamā* rejected his interpretation and reimposed a ban on its occupation. Salūt to this day remains virtually abandoned, although further upstream in the Jabrīn

area, the Ya'āriba did redevelop some of this old settled area (details in J. C. Wilkinson, 1977: 258-65).

This archaeological and historical evidence concerning the early period, when coupled to other local tradition, such as that which claims the oldest village in Oman is Izkī followed half a century later by Nizwā (*Nahḍa*: 181), leads the writer to the following provisional conclusions about the development of the early *qanāt* of Oman.

The earliest Iron Age settlers started to recolonize along the foot of the mountains on the western side, from a bridging point in the north in the Julfār region.⁵ The technique of *qanāt* building was probably developed amongst these peoples for Polybius' account indicates that *qanāt* were sufficiently old at the end of the third century BC for the local people to have forgotten who had built them and even where the mother wells were, whilst there is a reference in Sargon's campaign in the Urmia region in the eighth century BC (Thureau-Dangin, 1912) which is pretty clearly to *qanāt* (Laessøe, 1951). It is perhaps from the seventh or eighth century BC that the first *qanāt* were developed in Oman and there is perhaps some very tenuous evidence to suggest that the earliest ones tapped the lower ends of wadi fans where the water was more accessible and could be constructed by cut and cover technique (*i.e.* cut from the surface) and not tunnelling.⁶ In this connection I reject Goblot's thesis as unproven that *qanāt* developed from mining technology: it is equally possible, in fact more probable, that tunnelling developed as a result of extending *qanāt* upstream to tap the full storage and buried drainage lines in the main part of wadi fans. With such development the main *qanāt* of the piedmont zone were dug and must have received a major impetus in the Achaemenid period with Darius I's reorganization of empire. Again the Parthian period, which Mazaheri (1973) argues (partly on the grounds of the administrative structure they introduced which included subjecting the peasantry to forced labour, *bēghār*) was the main *qanāt* building period in Persia, may also have seen some development in Oman: certainly *qanāt* building seems to be practised

there at this time for when 'Mālik b. Fahm' arrived the stories relate that he had a *qanāt* built for him at Manḥ in the truce period before finally evicting the Persians.

So the early pattern of *qanāt* settlement in pre-Sasanid times, was concentrated on the west side of the mountains, from Julfār down to the Sharqīya, but probably no further down in the Ja'lān. There may have been some overspill of non-*qanāt* settlement onto the Bāṭina coast where the wadi debouchures approach the coast at the northern end in the Šuḥar area and around the Sīb area (ancient Damā) at the southern end. But the main development of the coast did not occur until Sasanid times (when Oman's maritime façade outside the entrance to the Gulf took on importance, see below).

This reconstruction is obviously tenuous and may have to be seriously modified in the light of new archaeological evidence. One feature that could add to our knowledge is a study of the actual techniques of *qanāt* construction, notably the roof lining system which may vary with different periods. One point that might be noticed already is that the main *qanāt* on the eastern side of the mountains tend to lie within the mountain zone proper whereas on the western side they are much more piedmont, a feature which would perhaps accord with the theory that their development progressed from downstream up. Furthermore, none of the *qanāt* on the western side of the mountains used inverted siphons (*gharrāq fallāḥ*): where they are found they are certainly indicative of a late construction or reconstruction, such as the Qasawāt *falaj* at Izkī rebuilt in Ya'āriba times. On the eastern side of the mountains such inverted siphons may be integral with the original construction, and indeed be one of the techniques, along with other developments using mortar, that permitted settlement in the Sasanid period within the more precipitous terrain of the intramontane wadi basins.

THE SASANID PERIOD

'The Kesra (Khusraw/Chosroe) named
'Omān Mazūn,
And Mazūn, O friend: is a goodly land,
A land abounding in fields and groves,
With pastures and unfailing springs.'

(*Kashf*, tr. Ross: 116)

When we move into the Sasanid period (mid-third to mid-seventh century AD) the evidence about the work of the Persians becomes much less tentative. Since the writer has already published a specialized article on this period (J. C. Wilkinson, 1973; additional material in 1974, 1975 and 1979), it will suffice here to use the relevant conclusions without discussing in detail the source and other evidence.

Although Persian control over Oman was clearly re-established early in the Sasanid period, inward Arab migration continued, probably to reach a climax during the unsettled government of Kawādh (AD 488-531), at which time a new wave of Arab settlers, led by the Shanū'a Azd, succeeded in carving out tribal territories for themselves in the mountain heartland of Mazūn. Subsequently Khusraw Anūshiravān once again brought the region firmly back into Persian hands, forcing a treaty on the Arabs that seems to have endured right up to the coming of Islam. Under the terms of this agreement ('Awtabi, Paris MS 271^r; Johnstone MS 201^r), the country was divided into two parts, one of which was deemed to be full Persian territory, Mazūn. The main commercial and military centre here was in the Ṣuḥār area (SH/11 is a possible site), a port that formed part of the Persian maritime empire which extended from the Gulf westwards along the south Arabian coast and eastwards towards the Indus.⁷ A major subsidiary centre was developed inland behind the Bāṭina at al-Rustāq, where the extraordinary prow-shaped fort is still known as the Qal'at al-Kisra (Khusraw Anūshiravān). Watered by the Falaj al-Ṣā'ighi, it now forms the central keep of the present fortress complex which is developed around three main 'towers', the Burj al-Shayāṭīn (the old Sasanid part), the Burj al-Riḥ (Ya'āriba) and the Burj al-

Ḥadīth (constructed by the first Āl Bū Sa'īd ruler, Aḥmad b. Sa'īd): below it lies one of the oldest and most important Ibādi mosques, the Bayāda mosque. Five major *qanāt*, drawing from both hot springs (resurgences in areas of high geothermal gradient) as well as the normal wadi ground water, irrigate the oasis, chief of which is the Falaj al-Maysar. Considerable other development occurred in the area, much of which was abandoned or destroyed in the course of the centuries (as is illustrated by the change in name of ancient al-Sawni into modern al-'Awābi).⁸

Al-Rustāq, it is to be noted, is no more than the Arabization of the Persian *rustak*, so perpetuating the original meaning of the late Sasanid period, that of the administrative centre of a frontier province. From it the Persian government controlled rural Mazūn through a network of (reputedly 4,000) *marāziba*, frontier lords probably operating from a set of forts⁹ in the principal settlements, and *asāwira*, a military élite who probably had fiefs allocated to them from which they were responsible for raising levies: power in the villages was exercised by the *hanāqira* (in its Arabized form of the name; sing. *hang(q)ari*) whose role seems to have been more that of a capitalist land-colonizing class, than that of simple *dehqans*. Near al-Rustāq (possibly in the Wādī Banī Ma'āwil near the fortified centre of al-Nakhl) also lived the Shanū'a Azd *shaykh* who was paramount leader of all the Arab tribes of the Oman area and whose role the Persians officially recognized by his appointment as *Julandā*: it may have been in order to keep control over his direct tribal followers, the Yaḥmad and the Awlād Shams, who lived in the valleys of the Ghadaf, that the Persians selected al-Rustāq as their site for their main fortified centre in the interior. (J. C. Wilkinson, 1973; 1974; 1975).

Within this fully Persianized territory the Arabs, who for the most part lived as herdsmen outside the villages, were theoretically administered through their own tribal system (at the head of which was the *Julandā*), but in reality they were probably more or less directly controlled by the local Persian officials. The majority were still nomads but those that had settled in the villages were treated like the rest of the subject peasantry

(*bayādīr*, *ahl al-bilād*), while those who worked in the Persian marine or earned their living in the towns were simply considered to be part of the common people (the '*ulūj*'), and they paid their taxes and dues directly to the Persians. Throughout this region the Arabs were regarded as second-class citizens, and such of them as had begun to settle were considered detribalized and incorporated into the 'subject' classes.

Rather different was the situation in that part of Oman which lay outside direct Persian rule. Here the Arabs enjoyed a degree of autonomy, with Persian control exercised indirectly through the *Julandā*. This Arab territory consisted of the western desert borderlands along with the two areas of the mountain region that lay at the end of their main migration routes into Oman. Of the south-eastern Arab settlement area we know little; it may have had its own *Julandā* (from the Banī Salīma who occupied the mountains behind Qalhāt, the Jabal Minqāl, and also lived on the Persian coast around the entrance to the Gulf), and his area of control possibly included the whole of the Ja'lān, the lower Wādī Ṭa'yīn, and the outer confines of the Sharqīya. The northern area was very much more important and stretched from the borders of the Sīrr ('Ibrī area) as far as Julfār. The main centre here was at Tu'ām (Buraymī oasis), but the Arabs were also allowed control of their own port at Dibā; this, along with Ṣuḥār and Damā (respectively at the northern and southern ends of the Bāṭina coast), also formed part of the network of periodic trade fairs which covered the Arabian peninsula (*Sūq al-'Arab*), but at Dibā the *Julandā* had the right to the tithe, whereas in the other two ports it was the Persians who collected it.

Now one of the things that is clear about this second major period of Persian rule in Oman is that there has been a distinct shift eastwards in the principal area of economic activity. Whereas the early land colonization appears to have developed along the inner side of the mountain chain from a bridging-point at the entrance to the Gulf, the Sasanid interest focused on the development of a maritime empire based on a full exploitation of the monsoon trading pattern (*cf.* also Whitehouse & Williamson, 1973), and so tended to make much

greater use of the eastern coast of Oman (as also Dhofar). And it was in association with this maritime interest that the major colonization of the Bāṭina littoral strip and of its mountainous hinterland came about. But such work was not confined to the east for although the Persians had abandoned the Zāhira and certain peripheral areas to the Arabs, their area of direct rule included most of the fertile parts of Oman. So the writer believes this period also saw an intensification of the old-established *qanāt* network, notably within the mountain area, a possible extension of it south-eastwards to the outer limit of reliable water supply and a development of the water resources on the plateau of the Jabal al-Akhḍar. Oman, I believe, is another case which would support Frye (1977) in his contention 'that the amount of land under cultivation within the confines of the Sasanid empire was greater in area under the Sasanians than at any other time in the history of the Near East'.

Thus the *mise en valeur* of the land of Oman was completed in Sasanid times, and the *qanāt* settlement pattern finally established. And up to the coming of Islam the Arabs were still largely foreigners in the villages, where they represented a frontier people, the threat of the desert to the sown (*cf.* Ṭabari i: 1686 in particular). In Mazūn proper they had a worm's eye view of the organization of the land as they scratched a living as herdsmen, transporters, fishermen, sailors, and weavers. Those that had become cultivators paid heavy taxes to the Persians and formed part of the lowest orders in the semi-bureaucratic, semi-feudal structure which emerged in Oman after Anūshiravān's reform. Their pre-Islamic status is summarized by what their enemies said about them: had it not been for the Ḥijāzīs bringing them Islam they would still be the hirelings of the people whom they now rule, living their backward way of life in the coastal lowland and desert outbacks to which they were relegated by their former Persian masters (Ṭabari i: 2911-2); the people of Oman were 'animals that do not seek to better themselves' and their country, along with Sīrāf and Ubulla formed one of the 'three sinks (*ḥushūsh* contrast with *janān*) of the world' (Ibn Qirīya to al-Ḥajjāj ibn Yūsuf and al-Aṣmā'i

quoted in Ibn Faqih: 92 and 104). To call an Omani a Mazūni was the greatest possible insult because it referred to his subjection to the Persians in pre-Islamic days: 'as for the Azd, the Azd of Abū Sa'īd [al-Muhallab] they hate to be called the Mazūn' said Kumayt, and another famous poet, al-Jarīr, celebrated the final defeat of Yazīd ibn al-Muhallab in 720 AD by a much recited couplet which started 'the fire of Mazūn and its people have been extinguished'; Abū 'Ubayda, who never lost any chances to hurl invective at the Muhallabites comments despidingly that the Mazūn are sailors (cf. al-Mubarrad *Kāmil*: 567-8, 642; Yāqūt *Buldān* art. *al-Mazūn*; Ṭabari ii: 489; the articles *Zuṭṭ* in the *Tāj al-'Arūs* and *Lisān al-'Arab*).

Yet their very lowliness may have given them some appreciation of the problems and hardships of peasant life which was to play an important part in the creation of a new society when eventually the Arabs were to evict the Persian ruling

classes with the coming of Islam. The writer firmly believes that there was a genuine rapport between the ordinary Arab tribesmen and certain of the lower elements of society in the Sasanid lands, the 'ulūj, the *ahl al-bilād*, etc., and this in turn was later to find expression both in the composition of the first so-called Khawārij bands and in their attitudes towards selecting their leaders (J. C. Wilkinson, 1982). Certain of these egalitarian ideas were thus, right from the start, built into the theory of the Ibāḍi movement, and were to play an important role, once the Imamate was established, in integrating the villagers and tribesmen into a single society with a strong attachment to the soil and a high sense of regional identity. But the history of the unification of village society in Oman and the eventual emergence of the traditional system of land organization there between the ninth and eleventh centuries is another story.

NOTES

¹ This paper amplifies and brings up to date my original study (Wilkinson, 1977; notably chapter VI) in the light partly of my own subsequent work, and partly from the enormous amount of new material that has appeared with the development of Omani studies since my book went to publication in 1974 (there was a long history of publication delay). Since much of my basic material concerning the Omani evidence is dealt with in that work it would be tedious to repeat the details here and, in general, references are made only to new research.

² Al-Ḥamrā and Birkat al-Mawz were restored temporarily, the latter in 1066/1656 as the result of a joint venture between Sulṭān b. Sayf al-Ya'rabi, who had built the great fort at Nizwā reputedly from the plunder of the Portuguese at Diu, and a number of local clans, notably from the 'Abriyīn. Bal'arab b. Ḥimyar sold the Ya'rabi interest in 1155/1742 in settlement of a debt to an 'Abri shaykh, and it was from this time of disturbed politics that the 'Abriyīn, as also a number of other tribal groups that had initially founded their fortunes by closely operating with the Ya'ariba (e.g. the Manādhira of al-Silayf and the Ḥawāsina in the Sirr/Ibrī area) began to develop major political power as they took over the Ya'ariba property and fortifications. (For details of the 'Abriyīn history see J. C. Wilkinson, 1969: chapter vii, largely based on accounts in the *Nahḍa*: a history of his tribe written by the recently deceased Shaykh Ibrāhīm b. Sa'īd al-'Abri, kindly shown to me by Dr Dale Eickelman, supplements the accounts in the *Nahḍa* with some very interesting details).

³ Various dyes were brought from the Yemen and according to Dr Roderic Dutton it was from there that apiculture would have come. It is perhaps worth noting in the Yemeni context that the Omanis would have nothing to do with coffee at this time and it was not until A. Nabhān Jā'id b. Khamīs al-Kharūṣi (c. 1735-1822) finally decided in its favour that it became legal, according to a *sīra* by his son Nāṣir b. A. Nabhān.

⁴ Dr Calvin Allen had this particular piece of information, I believe, from Shaykh Muḥammad b. 'Abdullāh al-Sālimī. Obviously al-Ḥazm was part of an ongoing project. It was Qayd al-Arḍ Sayf b. Sulṭān who originally restored the *falaj* but it was his son Sulṭān b. Sayf II who built the actual fortress on the property he had inherited from his father (Ma'wali *Qiṣaṣ*: 120, 122; Sālimī *Tuḥfa* ii: 100, 111).

⁵ The Arabized version of a pre-Islamic name, something like Jurra-fār, which designated the settled area on the north coast extending from the Dubāi-Sharja area (al-Ṣabkha in early Islamic sources) to the Musandam peninsula.

⁶ If this is so it would account for the relatively low position of BB/15 on the wadi fan. The fort, however, remained the main centre for political control even though other settlements were subsequently developed nearer the mountains.

⁷ This whole area from Ubulla (Basra area) at the head of the Gulf to the Indus had such an integrated maritime commercial structure that it was designated *Arḍ al-Hind* by the Arabs, a name that persisted even after the coming of Islam.

⁸ Al-Sawni implies an area of permanently cultivated land whilst 'Awābī is land under seasonal cultivation.

⁹ Dr E. d'Errico is of the opinion that part of the Bahlā fort is Sasanid. It would be interesting to know how many of the other fortified centres of the interior also have a Sasanid base.

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Contributor's address

DR J. C. WILKINSON, School of Geography, University of Oxford, Mansfield Road, Oxford, England.