

an association between the skeletal elements. This operation, which is of fundamental importance in palaeodemographic investigations, will also provide a basis for our understanding of the chronological and cultural dynamics of the whole burial ground.

The anomalous underestimation of infants indicated by the preliminary results was confirmed by subsequent evaluations. At the same time, non-definitive sex and age determinations carried out in the field led to a further lowering of the mean life expectancy at birth for both sexes. Modal values thus seem to be firmly constant at 18 to 21 years of age (tab. 3).

As far as the palaeopathological and the more general palaeoecological aspects are concerned, the scanty evidence of hyperostosis of the skull diploe seems to point to the need to reassess several of the models developed during previous investigations in connection with the probable role of the mangrove swamp as a source of differentially selective pathogenic agents. On the other hand, there was definite confirmation of the incidence of *spina bifida*, an extremely interesting trace character in assessing the degree of isolation, endogamy and genetic drift of a human community. The fairly good general state of preservation of the material made it possible to detect even in the field the existence of interesting and peculiar bone anomalies and damage, also of traumatic-accidental origin. It is also very interesting to have such a large number of intact pubic symphyses of female individuals which can be used to evaluate the minimum number of full-term pregnancies by analyzing any traumatic alterations to the ventral and dorsal surfaces. Most of the sample, which consisted mainly of sub-adult individuals, showed little evidence of palaeopathological damage to the masticatory apparatus. On the other hand, a high degree of wear in the permanent teeth according to age class was again observed. The large number of teeth now available in comparatively intact upper and lower jaw dentitions provides us with a large sample for each morphological class.

Arab Republic of Yemen

After the approval by the Department for Cooperation for Development of the Ministry for Foreign Affairs (February 14th 1983) of the Is.M.E.O. plan for the vocational training of local archaeologists in the Arab Republic of Yemen, the research and teaching activities related to the first year of the five-year cooperation plan were carried out in that country from April 16th to July 7th, and from October 1st to November 28th 1983.

The work was organized in liaison with the director general of the General Organization for Antiquities and Libraries of the Arab Republic of Yemen, qāḍī Ismāʿīl al-Akwāʿ, and was coordinated by Prof. Alessandro de Maigret at the 'Italo-Yemenite Centre of Archaeological Cooperation' of Ṣanʿā'. Set up with equipment provided by the DCD, the Centre has been used to run theoretical and practical courses of archaeology held by experts of the Italian Mission, and followed by officials of Antiquities and of the Museum and of final year archaeology students from the University of Ṣanʿā'. The Centre has also been used as a workshop for the preparation, registration and analysis of the archaeological evidence gathered during field work.

The following experts participated in the activities as lecturers-researchers: G. Bulgarelli, inspectress at the Pigorini Museum in Rome, for the Palaeolithic, A. Zarattini, inspectress at the Archaeological Superintendence of Lazio, for the Neolithic, A. de Maigret, associate professor at the Oriental Institute of Naples, for the proto-historical and pre-Islamic historical periods, G. Ventrone, associate professor at the Oriental Institute of Naples, for the Islamic period, L. Costantini, expert in bioarchaeology at the Museum of Eastern Art in Rome, for palaeobotany F. Di Mario for lithics, M. Angle and A. Gianni for pottery, M. Jung for rock carvings, the architects P. Berardi, V. Labianca and G. Novella for topography and surveying, M. Picchi for restoration, A. Solazzi for pho-

tography. The Mission also availed itself of the services of Prof. M. Tosi as scientific advisor for a preliminary evaluation of the finds of the protohistorical period.

The research work was carried out at two different scientific levels: I) archaeological reconnaissance of the Wādī Danah catchment area; II) specific analyses of individual sites found in the area. These two levels of investigation, which are exclusive of activities in other sectors (see below), will be followed some time in the next few years by a third level at which extensive excavations of selected sites will be made.

The archaeological reconnaissance carried out by A. de Maigret is aimed at reconstructing the peopling of inner north Yemen in ancient times by means of an analysis of an ecologically organic territory. The specific object was above all to define more accurately the identity and the extension of the pre- and proto-Sabaeen cultures discovered in the course of prospecting by the Italian Mission in 1980 and 1981, i.e. prior to the cooperation agreement.

The basin area involved this time (fig. 45), which is archaeologically unexplored and mostly unknown in modern topography, the one lying between the physiographic strip known as the 'Eastern highlands' (between the 2000 and 2300 contour lines), i.e. the area comprising the provinces of Ḥawlān at-Ṭiwāl and Al-Ḥadā'. The region contains the majority of the main western tributaries of the Wādī Danah and extends over the large gentle rocky slope composed of Palaeozoic granite and Mesozoic sandstone which separates off to the east from the Cenozoic limestone shelf supporting the landlocked basins of the central Yemeni plateau to the west.

The ecology of the region differs sharply from both that of the plateau and that of the eastern desert boundary, i.e. from the regions that have hitherto been the sole representatives of Yemeni archaeology. This accounts for the assumption on which the research has been based — namely, the

lack of archaeological knowledge of such a region, which does have a marked ecological character of its own, may be related to the current absence of information regarding the previous culture of southern Arabian civilizations in historical times.

Of the more than 70 archaeological sites discovered during the exploration phase, about one thirty date back to before historical times. At least a dozen of these are related to a period that could be defined as 'Late Neolithic' owing to the persistence of flint tools, or even 'protohistorical', since it immediately precedes the Sabaeen culture. In addition to the two sites of this period discovered in 1981 along the Wādī Yanā'im, there are now the new sites of Wādī Ḥabābiq (Al-Masannah, Silbām ar-Radā'i), Ḡabal Ša'ir, Ḡabal 'Amās (Širm al-'Abādilah) and of the territory to the immediate south of Wādī Ḥaykān in the vicinity of the villages of Banī 'Isa, Al-Ḡabāhirah and Banī Buḥayt.

This culture, which comprises large groups of circular or roughly rectangular buildings built of sandstone or granite blocks (dwellings, ovens, fences) concentrated around areas of communal activities, is characterized by comparatively undecorated but morphologically typical handturned pottery and by a non specialized stone industry in which bifacials are absent. It is widespread throughout the physiographic area under examination and it was thus deemed of interest to study it more closely and in greater detail (fig. 46).

A number of trial trenches were thus dug in the site of Al-Masannah, which is one of the largest and best preserved. The excavation work was directed by A. Zaratini and involved one of the central courtyards of the village, a room and two fire-pits (fig. 47). It was thus possible to make a preliminary stratigraphy of the site and to discover numerous surface artefacts (stone tools, grindstones, pottery, necklace beads, etc.) and to take a series of organic samples for the purpose of analysis (charcoal, seeds, bones). A preliminary study of the pottery seems to point to a typologi-

cal kinship with Syro-Palestinian Bronze Age finds. This is confirmed by C14 analyses of the charcoal recently completed by the 'Laboratoriet for Radiologisk Datering' of Trondheim (Norway), which gave a mean date of 1980 ± 80 B.C. (dendrochronological calibration 2500 ± 200 B.C.). A preliminary analysis of archaeological soil and of vegetal inclusions in the pottery have enabled L. Costantini to establish the presence of barley, flax and sorghum (to be confirmed) at Al-Masannah. With a view to making a quantitative evaluation of the typological data gained from the trial trenches, surface samples were taken at Al-Masannah and at site (i) of Wādī Yanā'im; a complete graphic survey was made of all the emerging structures (figs. 48-49).

This year's reconnaissance has led to the discovery of a second new lithic industry, which has temporarily been defined as 'Early Neolithic' to distinguish it from the later stage of Al-Masannah ('Late Neolithic'). Its greater age is proved by the absence of pottery (which has earned it also the name of 'Aceramic Neolithic') and by the isolated, roughly oval shaped structures not yet clustered into an urban organization as happened later.

This culture is characterized by an extensive lithic industry (leaf-shaped bifacial points, blades, gouges, planes, 'tranchets', burins, end-scrapers, etc.), which had already been found in at least eight sites scattered throughout Ḡabal 'Amās, at the foot of the Ḡabal Ša'ir and further south along the Wādī 'Uš (fig. 50). In nearly all cases the settlements appear to nestle in small secondary valleys, the slopes of which are supported by rows of solid granite terraces. Above the latter, the oblong houses have been built some distance apart, with their long axis running in the direction of the ground slope (fig. 51).

Also in this case it was decided to subject selected sites to more detailed investigation in order to define the culture's characteristics more accurately. Directed by A. Zarrattini, the operations consisted of systematically sampling the surface finds (Ḡ. Qu-

trān, W. 'Uš), of partial (Sirm al-'Abādilah, Al-Watadah) or complete (Ḡ. Quṭrān, W. 'Uš [i]) architectural surveys of the outcropping structures and in a stratigraphic sondage carried out at the site of Ḡabal Quṭrān (Al-'Amās).

The excavation was performed both inside and outside a large semi-circular construction comprising a double row of granite blocks (fig. 52), at the point in which one of the stones on the inner row bears a full relief carving of a motif consisting of a figure with five pairs of superimposed ram's horns (fig. 53). Beneath the surface, and in association with the structures, there was a thick archaeological layer containing abundant lithic material (bifacial obsidian, flint and basalt tools, rubbers, hammerstones) and bone fragments of various animal species. The typological study of the lithic industry and the analyses being conducted by Prof. S. Bökönyi on the bones, will shed further light on the chronology (4th mill. B.C.?) and the palaeoeconomy of this new Neolithic culture of northern Yemen.

The 1981 reconnaissance led to the discovery of a Middle Palaeolithic workshop at Humāyd al-'Ayn, on the banks of the Wādī Ḥabābiḍ. A detailed analysis of the site carried out this year under the direction of G. Bulgarelli has given the following results. Both the chronology and the function of the site have been confirmed. It has been possible to establish a typological diversification of the artefacts in their area of distribution, so that the site of Humāyd al-'Ayn can be subdivided into at least four different areas. The finds extend over a much greater area than had originally been supposed, and actually take in the area of the Late Neolithic site of Al-Masannah. The lithic industry found in these excavations has made it possible to make a more precise definition of the Palaeolithic typologies which have been rendered perfectly clear by the samplings carried out in the three calcarenite terraces surrounding Al-Masannah, as well as in the higher terraces which at Humāyd al-'Ayn form a sheer drop from the Turkish ruins to the Wādī Ḥabābiḍ (fig.

54). Two stratigraphic trial trenches cut in the area north of Al-Masannah revealed no archaeological levels. Other, Mousterian type tools were found on the plateaus lying east of this area, at the point where the sedimentary levels of the Mesozoic, which are higher, break up and slope down to the east towards the underlying pre-Cambrian crystalline formations (Gaddānat al-'Umarah).

This study of the Yemeni Palaeolithic was completed by prospecting in the southern part of the landlocked basin of Ma'bar. Here, in the Dayq Qā'Gahrān area, a concentration of Lower Palaeolithic tools was found in the alluvial filling layers now covering the eastern terraces of an isolated volcanic spur on the plain, only a few kilometres south of Ma'bar. It has been established that the material gathered (bifaces, cores, flakes) is related to the Acheulean industry of East Africa and to the artifacts recently discovered in South Yemen.

Small isolated circular structures (diam. 4.5 m.) have been frequently found in the region explored between Wādī Miswar to the north and Wādī Haykān to the south (Silbām ar-Radā'i, Gaddānat al-'Umarah, Gabal Ša'ir, Gabal 'Amās, Sabbalat Banī Buḥāyt) (fig. 55). These structures are usually arranged in clusters on high ground in the various regions. One characteristic shared by all of them is an inner circle of large stone slabs laid edgewise (diam. approx. 2 m.) and a series of long radial double rows of stones laid flat (fig. 56). Varying in number, direction and length, the latter all start from the central core. These structures are quite common throughout Yemen and Arabia. However, since the circles have almost always been found to be empty, it has still not been possible for investigators to establish their function and chronology.

Since the Al-Masannah excavations were in progress, it was decided to make a detailed study of two of these circles found near the site of Silbām ar-Radā'i. By means of a rapid dig, part of the ground plan and section of the structures were exposed

(fig. 56). The structures had apparently been covered by a *tumulus* in ancient times, and one of the chambers formed by slabs contained fragments of human bones mixed with animal bones (fig. 57). Although it is hard to deny the burial function at this point, only the results of bone analyses carried out in Rome will be able to provide a definitive clarification of the use and, above all, the chronology of these monuments which, despite their widespread distribution in southern Arabia, still remain to be explained.

The pre-Islamic historical period is the one that is relatively least documented in the exploration area. The most important Himyarite sites, in any case already known and visited in search of pottery for comparison purposes (e.g. Ḥammāt Diyāb, Al-Ḥaṭamah, Ṭah, to the south; Gaymān, to the north; Naḥlat al-Ḥamrā', to the west), lie outside the actual hydrographic basin, i.e. in the physiographic strip above the 2300 contour line.

The Sabaeo-Himyarite occupation of this western portion of the Wādī Danah catchment area (with the exception of Baynūn and Madīnat al-Aḥḡur, discovered in 1981 on the W. Ḥaykān) virtually boils down to small forts guarding the main lines of communications (e.g. Kawlat al-'Adī, on the route between Širwāh and the plateau) and caravan resting stages. In this connection, a large number of *mawāḡil* (sites with cisterns) have been found on the sandstone plateaus north of the village of Banī Buḥāyt (Māḡil Ṭāliḥ, Māḡil Manzār, Al-Gawlāyn) and on the one further north in Gabal 'Urqūb (Ar-Razāy).

On the basis of an inscribed stamp seal found at Māḡil Ṭāliḥ and the polished red ware, the sites seem to belong to the historical period. The function of these finds is related to the presence of large open rock quarries dug in the Jurassic sedimentary tablelands (fig. 58), near or on which the cistern sites are situated. The long-abandoned quarries exploited the large flat sandstone outcrops. As shown by the large heaps of tiny flakes and the signs of rough-

hewing still visible on some of the blocks, the material must have been finished directly on the spot.

The only possible approach to the Bānī Buḥāyt tableland is from the south. The *mawāḡil* spaced at regular intervals along this approach (from the north: Al-Gawlayn, M. Manzār, M. Ṭāliḥ, Baynūn) seem to mark the ancient route followed by the carts transporting this excellent and scarce building material towards the large towns of the Himyarite kingdom.

An opportunity to gain further insight into a large Himyarite period town was provided by the request for scientific and technical assistance made to the Italian Mission by the Yemeni Antiquities with a view to making a systematic documentation of the ancient complex of Šibām Girās (30 km ca. to the NE of Ṣanʿāʾ). Firstly, in order to implement the project, which was drafted after a number of funeral depositions of probable Himyarite origin had been found in two caves near Šibām (fig. 59), the whole area of Girās and Šibām was mapped. This made it possible to obtain also the ground-plan and sections of the ancient Himyarite site of Suḥāym, as well as the positions of the numerous chamber graves on the face of the Ḡabal Marmar and the mapping of the two graves with the depositions. A map was also made of the famous nearby Himyarite-Islamic complex of Ḥuṣn Dū Marmar (fig. 60). The work was completed by collecting pottery and by making a photographic and TV survey of all the structures. The use of the TV camera was chosen as a normal method for recording data (also at Raydah and ʿAmrān). The reason for this choice was the extensive and rapid degeneration undergone by the Yemeni monuments, especially in historical times.

Numerous other sites, which for the time being we shall generically define as 'Islamic', were discovered during the exploration (fig. 61). The pottery typology and architectural technique used distinguish them sharply from the preceding periods. At the same time, the generally poor quality of the ma-

terials and structures betrays the marginal nature of the culture, which will of course complicate the diachronic attribution of the finds. The most important sites are related to the settlement complex discovered on and around the southern terrace of Ḡabal ʿAsāl, inside which certain obvious differences in the vase finds and construction techniques used may make it possible to attempt a 'horizontal stratigraphy' of the various sites.

In the meantime, Prof. G. Ventrone has begun a systematic study of Yemeni Islamic pottery, analysing the collections of potsherds from both the coastal and inland regions preserved at the National Museum of Ṣanʿāʾ. In the search for fresh evidence, she has also collected pottery from the Islamic site just north of Raydah (where the remains of a mosque came to light during excavation work to build the Ṣanʿāʾ-Saʿdah road) and on the Ḥuṣn Dū Marmar plateau described above. This study aims at illustrating the early Islamic culture of Yemen and will contribute to the dating of the post-Himyarite sites of Ḥawlān at-Ṭiwāl.

Mention must also be made of the work begun this year on recording and cataloguing all the numerous rock carvings and graffiti discovered in the region explored (M. Jung) (figs. 62-63). The aim of the work is to make an internal comparative study of iconographies, styles, techniques and patinas, so as to establish a preliminary relative chronology of a form of artistic expression that, although confused by continuous intense use ever since ancient times, is nevertheless indicative of the various cultures that have succeeded one another in southern Arabia.

Prof. GHERARDO GNOLI

DIRETTORE RESPONSABILE

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Fig. 8 - Shaykh Dārā (Dūbēr valley). Ground-plan of Shaykh Bābā Jumat (N. Olivieri 1982).

Fig. 9 - Sēō (Kōhistān). Ground-plan of the mosque (N. Olivieri 1983).

Fig. 14 - Malamjaba, Gař. Capital of the mosque (Neg. no. Dep. CS 14507/9; U. Scerrato).

Fig. 15 - Alũch. Wooden elements of the mosque, lying abandoned (Neg. no. Dep. CS 14541/10);
U. Scerrato).

Fig. 16 - Bingōlai. Capital of the mosque (Neg. no. Dep. CS 14544/3a; U. Scerrato).

Fig. 17 - Tal (Dir). Roof decoration (Neg. no. Dep. CS 14565/25; U. Scerrato).

Fig. 18 - Paṭṭan. Wooden pillar of the mosque
(Neg. no. Dep. CS 14546/3a; U. Scerrato).

Fig. 19 - Paṭṭan. Particular of the outer wall of the mosque (Neg. no. Dep. CS 14547/30a;
U. Scerrato).

Fig. 20 - Shaykh Dārā (Dūbēr valley). Capital of Shaykh Bābā Jumat (Neg. no. Dep. CS 14560/17a; U. Scerrato).

Fig. 21 - Gōrunai (Swat). Particular of a pillar of the mosque (Neg. no. Dep. CS 14930/24a; U. Scerrato).

Fig. 22 - Sêo (Kôhistân). Verandah of the mosque (Neg. no. Dep. CS 14884/28a; U. Scerrato).

Fig. 23 - Sêo (Kôhistân). Capital of the mosque (Neg. no. Dep. CS 14884/8a; U. Scerrato).

Fig. 24 - Sēō (Kōhistān) Jumat. Particular of a pillar with relief (Neg. no. Dep. CS 14883/26a; U. Scerrato).

Fig. 25 - Karang (Kandyā valley). Capital of the mosque (Neg. no. Dep. CS 14888/4a; U. Scerrato).

Fig. 26 - Kiris (Baltistān). The Khanqa (Neg. no. Dep. CS 14909/23; U. Scerrato).

Fig. 27 - Skardu (Baltistān). Fort Mosque (Neg. no. Dep. CS 14905/35a; U. Scerrato).

Fig. 28 - Kapalu (Baltistān). Jami Masjid (Neg. no. Dep. CS 14915/15; U. Scerrato).

Fig. 29 - Kapalu (Baltistān). Particular of the verandah of the Jami Masjid (Neg. no. Dep. CS 14915/11; U. Scerrato).

Fig. 30 - Kiris (Baltistān). Mausoleum (Neg. no.
Dep. CS 14907/31; U. Scerrato).

Fig. 31 - Shigar (Baltistān). Pillar of the Rajahs'
Palace (Neg. no Dep. CS 14921/33; U. Scerrato).

Fig. 32 - Skardu (Baltistān). Marble elements from a moghul style palace reused in the Rajahs' Palace (Neg. no. Dep. CS 14903/26; U. Scerrato).

Fig. 33 - Skardu (Baltistān). Rajahs' Palace. Carved slab, of moghul style, belonging to a garden fountain (Neg. no. Dep. CS 14865/25a; F. Noci).

Fig. 34 - Oman. The outlet of wadi al-Shab seen from south. The prehistoric site is marked by the white arrow and overlooks both the creek and the ocean shore.

Fig. 35 - Smaller and larger burial cairns on top of the sandstone cliffs along the coast south of Dukhum, photographed from the prehistoric site of Ra's al-Khalf.

Fig. 36 - Ra's al Hamra (Oman). The excavated western portions of site RH5 at the end of the 1983-84 season. In the foreground the exposed bedrock below the graveyard shows traces of earlier round structures cut in the limestone surface.

Fig. 37 - Ra's al-Hamra (Oman). Curvilinear posthole alignments marking the plan of a dwelling structure of phase 3 in sq. HWO-HWS-HWX as exposed at the end of the season.

Fig. 38 - Grave 83 at RH5: the burial of a young female with a rich assemblage of ornaments and makeup items.

Fig. 39 - Grave 83 at RH5. Detailed view of the objects spread on top of the head, partly sliding from the right fist: 1. haematite pebbles, 2. small bone spatula, 3. *Callista* sp. valve, 4. string of *Nassarius* sp. shells, probably set in the hairdressing, 5. two bone pointers originally laid crosswise to set a chignon, 6. *Dolium* sp. shell.

Fig. 41 - Grave 76 at RH5. Detailed view of the infant skeletal remains under the hand of the adult male.

Fig. 40 - Grave 76 at RH5. A young male deposited with an infant under his right hand.

Fig. 42 - The redeposition-cremation area 43 at RH5: a general view from west before removal at the end of the 1983-84 season.

Fig. 43 - Detail of area 43 at RH5 graveyard: two *Ficus subintermedia* shells marked by arrow 1 in general view.

Fig. 44 - Detail of area 43 at RH5: skull of green turtle (*Chelonia mydas*) and large fishbones marked by arrow 2 in general view.

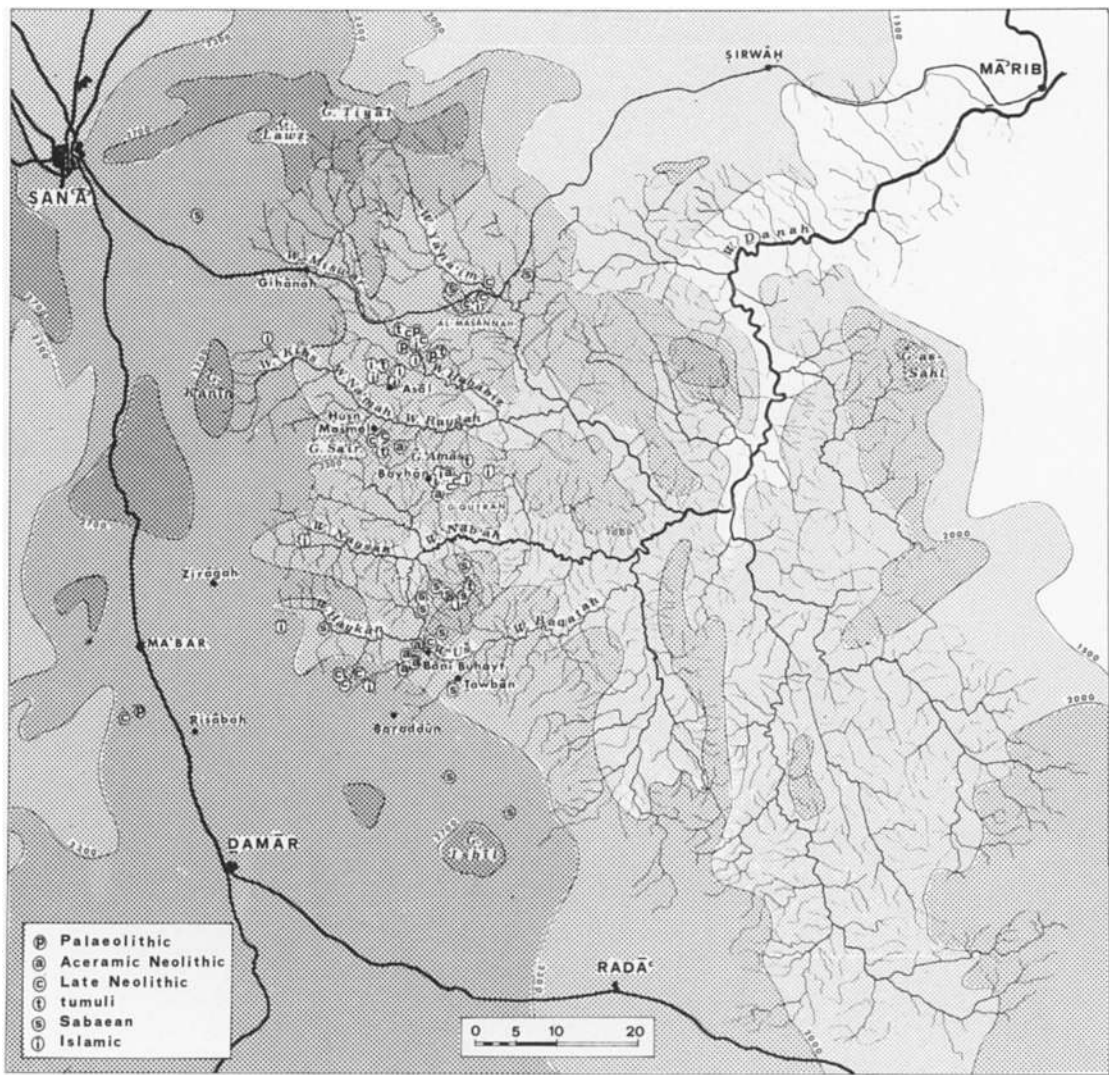


Fig. 45 - The Wādī Danah basin and the sites explored in 1983.



Fig. 46 - Al-Masannah: sandstone foundations of protohistorical dwellings.



Fig. 47 - Al-Masannah: fired brick well in one of the common courtyards of the protohistorical site, after the excavation.



Fig. 48 - Wādī Yanā'im: the protohistorical site WYi, viewed from the West.



Fig. 49 - Wādī Yanā'im: granite structures on the site WYi.



Fig. 50 - Wādī 'Uš: view of eastern sector of Neolithic site WUj (from the North).

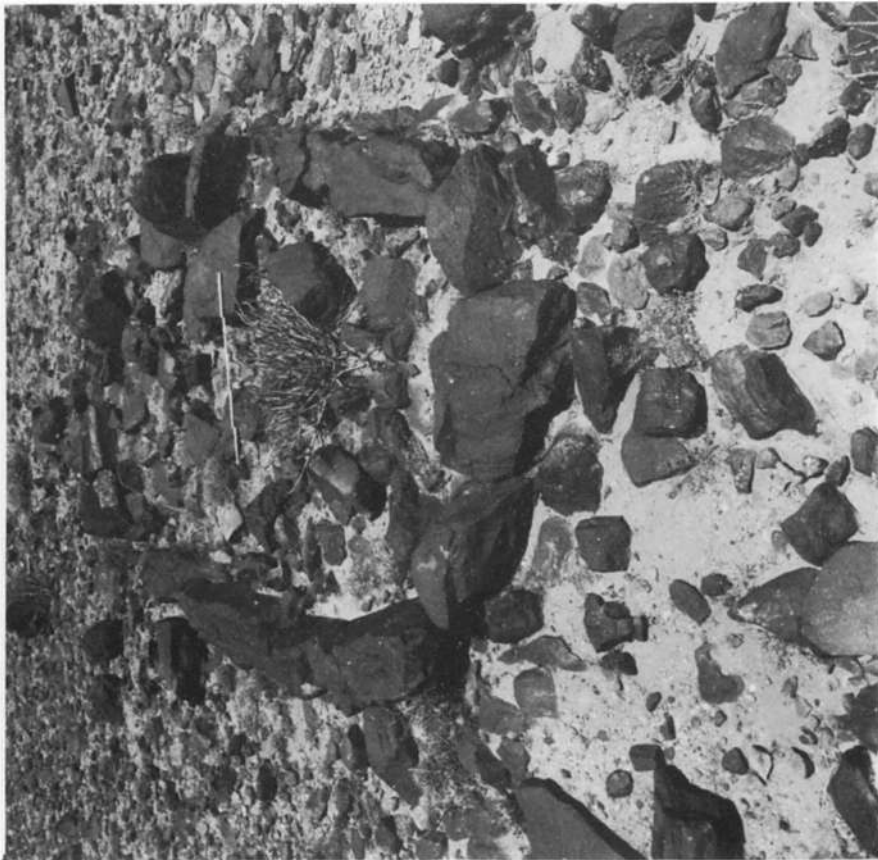


Fig. 51 - Gabal Sa'ir: oval-shaped granite structure in the ancient Neolithic site GSHiii.



Fig. 52 - Ġabal Qutrān: interior of semi-circular structure after excavation (Aceramic Neolithic).



Fig. 53 - Ġabal Qutrān: detail of decorated block after excavation.



Fig. 55 - Gaddānat al-'Umarah: one of the tombs with radial alignments.



Fig. 54 - Ḥumāyḍ al-'Ayn: systematic collection in the Middle Palaeolithic site.



Fig. 57 - Silbām ar-Radā'i: grave SR*iv* after excavation.



Fig. 56 - Silbām ar-Radā'i: grave SR*ii* after excavation (from West).



Fig. 58 - One of the sandstone caves north of the village of Banī Buḥāyt.



Fig. 59 - Šibām Ġirās: funerary caves in the wall of Ġabal Dū Marmar.



Fig. 60 - Ḥuṣṇ Dū Marmar: the plain with the Islamic site (from West).



Fig. 61 - Ḥuṣṇ Diyāb: ruins viewed from South (Late Islamic period).

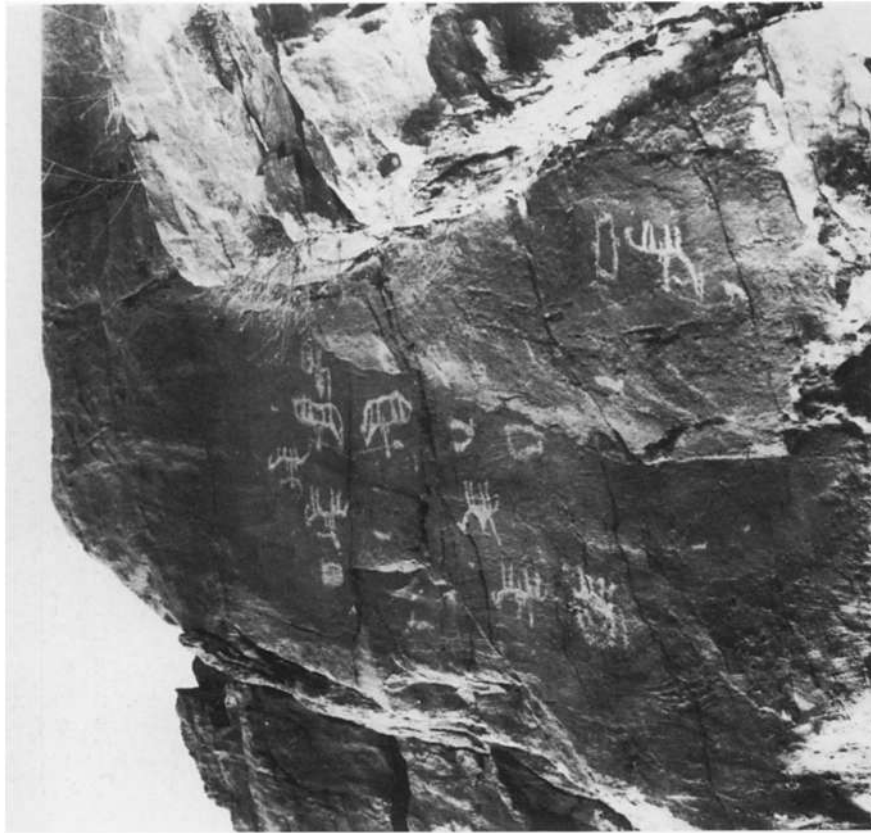


Fig. 63 - Ġabal 'Asāl: rock graffiti on the north side of the ġabal.



Fig. 62 - Ġabal 'Asāl: rock graffiti from the top of the site.