The initial peak for the Jalaris (75.02%) is much higher than for the Vadabaljias (51.59%). In the case of the Jalaris the distribution is characterized by an absence of marriages at distances of from 25 to 60 miles; for the Vadabaljias the gap starts at 30 miles (interrupted by a few cases at 40–50 miles) and ends at 65 miles.

This is a situation in which relatively large groups—4,000 Vadabaljias, 800 Jalaris—have migrated 100 miles from their home region. In the space between there is only a single related village, established by Vadabaljias. It has been four or five generations since these groups settled in Puri, and couples are of three kinds: (1) both spouses born in Puri; (2) one spouse born in Puri and the other born in the home region; (3) both spouses born outside Puri. The first type of couple is more frequent among Jalaris than among Vadabaljias, and this is reflected in the peaks at zero miles. Most Jalaris were born in Puri, while a considerable proportion of Vadabaljias were born in their home region. This creates a situation in which a person seeking a mate and failing to find one in Puri must return to the home region to do so. This constraint is obviously what has produced the bimodality in the distribution of marriage distances in these populations. In view of these findings, Malhotra's prediction can be extended from Brahmins and trading communities to communities of recent migrants, especially over short distances.

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Archaeological Survey in the Wadi Hawar Basin

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Archaeology in the Sudan has so far been the archaeology of the Nile Valley, with overwhelming emphasis on the historical periods. Apart from an isolated small-scale survey in the eastern Butana (Shiner et al. 1971), an area which will soon witness a large-scale investigation (Marks et al. 1980), there has been no archaeological work beyond the 10-km-wide strip along the Nile. It has become increasingly apparent that the sequence of events in the Nile Valley cannot be fully understood, at least as far as its prehistory is concerned, without considering neighboring regions. The geographical location of the Wadi Hawar Basin (straddling the juncture of the east-west route linking the Sahara and the Nile Valley and the north-south route linking Northern Africa and the sahel-savannah belt) recommended a survey for prehistoric sites in that region. The survey was meant to discover Neolithic communities in this archaeologically unknown area as well as to throw some light on the Nile-Saharan interrelation, including both early farming and ceramic development along the Nile. Sites with material diagnostic of the Early and Middle Neolithic of the Saharan-Sudanese tradition (wavy-line pottery, gorgetes, etc.) had been reported from a number of localities along the Wadi, but no investigations had been carried out. The Late Neolithic was even less well known. While the Early and Middle Neolithic were attested on the Middle Nile (Khartoum Hospital, Shaeinab, etc. [Arkel 1949, 1953]) no Late Neolithic site had yet been found in that region.

The study area (fig. 1) is situated in the southern part of the basin between lat. 15° and 17° 30' N and between long. 23° 30' and 24° 30' E, an area of about 5,000 km². The work was conducted under extremely difficult conditions of finance, personnel, equipment, etc.; nevertheless, it was possible to locate and test-excavate a number of sites. Priority will be given here to those of Late Neolithic age.

The topography of the area is characterized by wadi systems, all tributaries of the Wadi Hawar, and by many Upper Pleistocene sand dunes. Very few rocky outcrops disturb the wadi network. Since the Pleistocene, interdunal lowlands have been covered by a layer of wind-borne sand. Three Late Neolithic occupations, Umm Barrou 3, 4, and 5, were located on the tops and slopes of three stabilized sand dunes overlooking watercourses. They were well placed to exploit the wads and their catchments. The horizontal distribution of the artifacts (ca. 30 m x 35 m) and the depth of the cultural deposits (5–35 cm) suggest seasonal camps, each composed of few families.

The stone artifacts were predominantly made of quartz, a raw material of poor quality and granular nature. Its selection certainly does not reflect a cultural preference. Technologically, the three assemblages exhibit close affinities. The frequency of cores and core fragments suggests an economical use of the raw material, whose nature was detrimental to workmanship. The assemblages seem to belong to a technological tradition based on flake production. The tool typology is characterized by large-based points made on large, thick quartz flakes (22–53 mm long, 29–35 mm wide). Other artifacts include tanged points, arrowheads, and scrapers. Grinding equipment is well represented, and ground-stone axes can be considered characteristic.

The potsherds from the three assemblages show considerable homogeneity. That the pottery was locally made seems indicated by the sandy clay utilized and the irregular temper. Patterns of decoration range from basketwork to dotted straight lines to geometric and intersecting straight or dotted lines (below). All types are well represented in the Sahara.

The faunal data (Mohammed-Ali 1978) yielded evidence of species of caprine size and a definite eqid. The stone artifacts and ceramic styles suggest a date in the late 4th–early 3d millennium B.C., as similar industries dating to the second half of the 4th millennium have been discovered farther west in the Ennedi (Bailloud 1965, 1969; Huard 1967–68) and in Borku (Courtin 1969). This is supported by a radiocarbon date from Umm Barrou 3 in the range of 2610 B.C. ± 500 (Q-1537).

The survey also located a number of rock-art sites. Most of the paintings are inaccessible from the present ground level. Figures are painted on the walls of caves and rock-shelters and show no evidence of superimposition. The animals depicted (mostly cattle, occasionally being driven by men) seem to belong to the savannah and would be incapable of surviving under the currently prevailing climatic conditions of the region. No species typical of the desert is shown. The cattle in the majority of the paintings are humpless, dawlapless, and long-haired. Stylistically, the paintings belong to the Sahara rather than the Nile (Mohammed-Ali 1978). Their presence suggests the occurrence of nomadic groups in the region before the end of the last wet phase (ca. 2500 B.C.).

The artefactual and petrographic evidence from the Wadi Hawar seems to suggest that the area was wetter and richer in
plant and animal resources in the 5th to 3rd millennium B.C. and that it was inhabited by small mobile groups whose economy was based on domestic animals.

Certain elements of the Late Neolithic of the Wadi Hawar (geometric designs of dotted and intersecting lines on pottery and polished stone axes) seem to be attested on the Nile northeast of Wadi Hawar in the Nubian C-group, dated to ca. 2300 B.C. Neither of these elements and no other parallel material has yet been found anywhere along the Nile south of Kerma. Whether these connections were brought about by movements along the existing seasonal watercourses and their associated oases, which run southwest-northeast, is difficult to know. However, no comparable material is known on the Middle Nile, and, in fact, there is a gap of more than 2,500 years in the cultural sequence between Sheihinab (ca. 3300 B.C.) and the beginning of the Kushitic state (ca. 750 B.C.). In short, there is as yet no evidence for any occupation along the Middle Nile during the period of the Late Neolithic of Wadi Hawar and the C-group of Nubia.

Comparison of the radiocarbon dates for this Late Neolithic from the Sahara and for the C-group suggests that the static frontiers which characterized the socioeconomic pattern by the end of the wet phase might have driven Late Neolithic groups exploiting the area of the northern Wadi Hawar and the oases to the northeast to seek refuge along the Nile. Although this survey does not confirm it, it does lend support to Arkell's (1961) hypothesis that the C-group "culture" originated in the Wadi Hawar region.

Fig. 1. The Wadi Hawar Basin, showing sites with wavy-line pottery (black squares), with ground-stone axes and kahou pottery (black triangles), and with rock art (x's). Numbered rock-art sites are 1, Zorat el-Hammad; 2, Wadi Hase; 3, Qopt Umm Taswir; 4, Merbo; and 5, Taddugi.
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