
SHARING OF WATER RESOURCES AND POLITICAL UNIFICATION IN THE LOWLAND VALLEYS OF AND IN THE HADRAMAWT IN ANTIQUITY

Michel Mouton¹

ABSTRACT

Search for water and its management is a significant factor of complexity. The adoption of a technique for water supply can overturns the structures of a society. In ancient Yemen, the settlement pattern in the lowlands valleys was based on irrigated agriculture. The gradual development of hydraulic technics led to an increasing agricultural activity from upstream to downstream in the valleys. The sharing of the water along a same river bed was significant to the cohesion of the communities. The building up of a network of villages and towns along each valley resulted in the formation of the ancient kingdoms, Awsan, Saba', Qataban and their capitals on the edge of the desert. Each of those kingdoms bordering the Ramlat as-Sab'atayn had a strong identity, made of common religious and social practices on a well limited territory. The unification in the Hadramawt was of a different level. There, the seasonal floods in the main central course were never diverted, bringing about any sharing practices along the whole valley. As a consequence, irrigation practices did not facilitate the gradual integration of the different communities in a single political entity.

RESUMEN

La búsqueda del agua y su distribución es un factor importante de complejidad social. La adopción de una técnica de adquisición de agua puede transformar las estructuras de una sociedad. En el antiguo Yemen el patrón de asentamiento en las tierras bajas de los valles estaba basado en la agricultura de irrigación. El desarrollo gradual de las técnicas hidráulicas permitió un incremento de la actividad agrícola desde el curso alto al curso bajo en los valles. El reparto del agua a lo largo del lecho del mismo río fue primordial para la cohesión de las comunidades. La construcción de una red de aldeas y ciudades a lo largo de cada valle dio como resultado la creación de los antiguos reinos de Awsan, Saba o Qataban y sus capitales situadas en el margen del desierto. Cada uno de esos reinos que limitan con el ramlat as sab'atayn, tuvieron una identidad fuerte, conformada por prácticas religiosas y sociales comunes en un territorio bien delimitado. La unificación en el Hadramaut se hizo de manera distinta. Aquí, las inundaciones estacionales en el curso del valle central nunca fueron canalizadas, lo que supone la inexistencia de prácticas comunes de distribución a lo largo de todo el valle. Como consecuencia, las prácticas de irrigación no facilitaron la integración gradual de las distintas comunidades en una única entidad política.

KEYWORDS

Yemen, Sabaean civilisation, Hadramawt, irrigation, settlement pattern

PALABRAS CLAVE

Yemen, civilización sabea, Hadramaut, irrigación, patrón de asentamiento

The search for water has always been one of the major priorities of populations living in the lowlands of . Throughout history, it has stimulated the development of techniques and strategies aimed at acquiring this resource. Sharing water has, throughout history, been a major concern for populations; its distribution was predicated on the establishment of agreements and their observance. The degree of interaction in the sharing process appears consequently to be a meaningful element in the analysis of the level of integration of distinct population groups in a process of unification. In this paper we shall look at the formation of the agricultural landscape and of the communities from which

¹ CNRS, IFPO / . This article has been translated to the English by Martin Makinson and Isabelle Ruben.

the ancient kingdoms of the Yemeni lowlands originated, in the light of this process. The water shared was that of seasonal floods.

The geographical environment of the valleys opening onto the Ramlat as-Sab‘atayn desert has often been described². To the east of the Yemeni highlands, the elevation of the plateau decreases and the tablelands are suddenly incised by valleys and depressions in which the environment gradually becomes dryer as one descends towards the tectonic subsidence that extends from the Jawf to the Hadhramawt. Beyond the mouth of these valleys, the arid steppe turns progressively into desert (Fig. 1).

If one puts the Hadhramawt aside, these valleys are part of a mountain range whose elevation varies between 1,500 and a.s.l in the vicinity of Bayhân and to the south of wâdi Dura‘ and wâdi ‘Abadan. Further downstream, these valleys are from 1.6 to wide (wâdi Bayhân), and up to in some places (wâdi Markha, wâdi Jubâh), enabling cultivation of large agricultural areas. Further upstream, the slopes are steeper at the foot of the mountains and in the small tributary valleys.³

The valleys are extended, well-defined and delimited, shaped by running water. The river is both a centre of gravity - geographical and social - and a resource essential to the life of the village communities and towns which, in Antiquity as in medieval and modern times, developed on the irrigated agricultural lands along its course. The average rainfall is insufficient, as it varies between 60 and per annum. Irrigation was entirely based on diversion techniques of seasonal flash floods descending from the mountains and carrying huge masses of water. This runoff is the result of rainfall in the highlands occurring during two seasons of the year: the first one in the spring, linked to the circulation of westerly winds deflected by the rift, the other in summer caused by the south-western monsoon⁴.

In these valleys, the development of irrigation networks did not follow the pattern defended by K. Wittfogel which assumes a structured and integrated state behind any complex irrigation system⁵. The progressive development of techniques for the diversion, canalization and division of runoff water was a process that left numerous remains preserved along the valleys, in gullies and on fluvial terraces. The chronology of this technological and spatial expansion is a matter that still warrants clarification, but there is no longer any doubt that the earliest installations go back at least to the fourth and the beginning of the third millennium BC ⁶.

² Ueli Brunner, *Die Erforschung der antiken Oase von Mârib mit Hilfe geomorphologischer Untersuchungsmethoden*, Deutsches Archäologisches Institut San’a’, Archäologische Berichte aus dem Yemen, Band II, Mainz am Rhein: Verlag Philipp von Zabern 1983; Jean-François Breton, Jean-Charles Arramond, Brigitte Coque-Delhuille, Pierre Gentelle, *Une vallée aride du Yémen antique. Le wâdi Bayhân*, Paris: Editions ERC 1998; Paul Sanlaville, *Le Moyen-Orient arabe. Le milieu et l’homme*, Paris: Armand Colin 2000, 135-138; Tony J. Wilkinson, *Archaeological Landscapes of the Near East*, : The University of Arizona Press 2003.

Brigitte Coque-Delhuille, Pierre Gentelle, “Cruet et sédimentation contrôlée au Yémen antique”, *Géomorphologie : relief, processus et environnement* 2 (1997), 99-110, 101.

⁴ Sanlaville, *Moyen-Orient*, 206-208.

⁵ K. A. Wittfogel, *Oriental Despotism: A comparative Study of Total Power*, : Yale University Press 1957. It has been shown that the building and the management of community systems do not suppose a high level of social complexity; see for instance Robert McC. Adams, “Historic Patterns of Mesopotamian Irrigation Agriculture”, in: *Irrigation Impacts on Society*, Theodore E. Downing, McGuire Gibson, eds, Anthropological Papers of the University of Arizona 25, Tucson, Arizona: University of Arizona Press 1974, 1-6.

⁶ Ingrid Hehmeyer, Jürgen Schmidt, *Antike Technologie - Die sabäische Wasserwirtschaft von Ma’rib. Teil I*, Deutsches Archäologisches Institut San’a’, Archäologische Berichte aus dem Yemen, Band V, Mainz

Over the whole of the Middle East, a hot and humid phase is quite perceptible between 8500 and 4900 BC. This optimum, the Holocene, lasted longer in the southern part of the , where it was mainly linked to the monsoon. From 3800 BC, the amplitude of thermal oscillations decreased considerably. From then on populations gradually adapted to a stable but restrictive situation. Human and historical factors then became more significant than the demands and constraints of the physical environment⁷.

The earliest hydraulic installations in are no doubt later than this climatic threshold. In a highland valley located near the village of adh-Dhra'ah to the south-east of Dhamar, a dry stone wall retaining the water and sediments necessary for terrace cultivation has been dated to a little after 4000 BC⁸.

In the lowlands, available dates are derived from agricultural installations situated in the central course of the valleys. In the wâdi Markha, a charcoal sample from Aydat al-Gar, to the west of Hajar Yahirr at the mouth of the wâdi, has yielded a C¹⁴ date of the early second millennium (2130-1919 BC). Since the sample was taken above the natural bedrock (and below a stone sluice), U. Brunner cautiously suggests placing the beginnings of irrigation in this part of the valley around the middle of the third millennium BC⁹. At Marib, near the mouth of the wâdi Dhana, the silt accumulation (estimated at 0.7 to per year) indicates that the earliest irrigation works were built somewhere around 2400 BC¹⁰. In the al-Jadîda basin, the beginnings of irrigated agriculture have been dated early in the second millennium (1687-1432 BC)¹¹. Hajar Bin Humayd on the lower course of the wâdi Bayhân, at the centre of a large-scale irrigation network, was founded at the end of the second millennium BC by people who were already familiar with urban life, as well as a form of central administration and hydraulic techniques¹². These chronological markers enable us to date the settlement and cultivation of the central valleys to the middle of the

am Rhein: Verlag Philipp von Zabern 1991; Ueli Brunner, "Geography and Human Settlements in Ancient Southern Arabia", *Arabian Archaeology and Epigraphy* 8 (1997), 190-202; Tony J. Wilkinson, "The other side of Sheba: early towns in the highlands of Yemen", *Bibliotheca Orientalis* 62/1-2 (2005), 5-14.

⁷ Sanlaville, *Moyen-Orient*, 179-181, 186.

⁸ C¹⁴ date on a charcoal sample taken from sedimentary deposits accumulated against this construction; Wilkinson, "", 9.

⁹ 3640±60 BP, calibrated through CALIB 4, one standard deviation. Brunner, "Geography", 196. For this site, see also: Ueli Brunner, "Les débuts de l'irrigation", in: *Yémen, au pays de la reine de Saba'. Exposition présentée à l'Institut du Monde Arabe du 25 oct. 1997 au 28 fév. 1998*, Paris: Flammarion 1997, 53-54; Jacqueline Pirenne, *La maîtrise de l'eau en Arabie antique*, Mémoires de l'Académie des Inscriptions et des Belles-Lettres, nouvelle série II, Paris, pl. 18-19; Jean-François Breton, "Hagar Yahirr, capitale d'Awsan?", *Raydan* 6 (1994), 41-46. The rate of sedimentation calculated by U. Brunner for this site on the lower reaches of the wâdi Markha is rapid in comparison with that put forward for the wâdi Dura' by B. Coque and P. Gentelle: 1.3 to per century at al-Haraja, upstream where floods are numerous and alluvial deposits important, but only near the wâdi's outlet; Coque-Delhuille and Gentelle, "Crues", 108; Brigitte Coque, Pierre Gentelle, "Irrigations antiques dans le Yémen aride : champs et sédiments", *Bulletin de l'Association Géographique Française* 2 (1998), 158-169.

¹⁰ Hehmeyer and Schmidt, *Antike*, 11-12.

¹¹ 3280±110 BP, calibrated through CALIB 4, one standard deviation ; W. C. Overstreet, M. J. Grolier "Summary of Environmental Background for the Human Occupation of the in Wâdi al-Jubah", in: *The Wâdi al-Jubah Archaeological Project, vol. 5. Environmental Research in Support of Archaeological Investigations in the Yemen Arab Republic, 1982-*. J. Grolier, R. Brinkmann, Jeffrey A. Blakely eds., Washington D. C: American Foundation for the Study of Man 1996, 351-369, 365.

¹² Gus W. Van Beek, *Hajar bin Humeid : Investigations at a Pre-Islamic Site in South Arabia*, Publications of the American Foundation for the Study of Man vol. 5, Baltimore: The John Hopkins Press 1969, 367.

third millennium leading, by the end of the second, to installations whose complexity reflects a concentration of population in centres larger than hamlets housing just a few families. It is therefore between the end of the Holocene and this settlement phase, i.e. sometime between the early fourth and the mid-third millennium BC, that one should place the early development of the diversion techniques by family units and subsequently village communities.

Some models describe an agricultural expansion moving upstream from the lower courses of the wâdis to the upper reaches, the water flow there being far too powerful for inexperienced communities. The hypothesis of an opposite movement has been more convincingly argued¹³. Small secondary wâdis were used for experimentation before communities attempted to deal with the more considerable masses of water in the main valleys. Indeed, each hydrographical basin feeding a main river possesses an upper course grouping a number of tributary wâdis. The smaller ones are nowadays called *sh'ib*, a word meaning “branches” or “ramifications”. In South Arabian inscriptions, the word *s²'b* designates a sedentary community, subset of a larger group. According to A. F. L. Beeston, this term does not appear to bear any relation to kinship: “this is a grouping of two or more village communities into a unit called by a term corresponding to Arabic *sha'b*, for purposes primarily economic, secondarily socio-political”¹⁴; this author then points out that these groups were formed of farmers whose subsistence depended on the alluvial land along the wâdi courses. One could then add to the term a geographical significance: a community's territorial borders thus matched those of a small valley on the upper course of a hydrological drainage basin (*s²'b* / *sha'b* and *shi'b*). The smallest settlement unit was therefore a restricted group sharing a territory of small dimensions, whose limits were clearly defined and whose subsistence depends on fields irrigated by seasonal runoff in the upper parts of the hydrological network. This linguistic connection between first millennium texts and currently spoken Arabic does illustrate this type of settlement that, in our opinion, goes back as far as the 4th-3rd millennium BC.

The apparently simplest irrigation works are to be found at the bottom of slopes near the headwaters of wâdis, *shi'b* and gullies that open onto the valleys (Fig. 2). These constructions are related to small-sized areas of cultivation prepared on the flatter parts of slopes or on natural terraces along the central water courses. They consist of diversion walls built of rows of boulders, with reinforced ends, intended to catch part of the runoff and redirect it to the plots of sown agricultural land¹⁵. These early diversion constructions progressively became deflectors built across the central riverbed of valleys, and then real diverting walls channelling part of the seasonal water flow into lateral canals feeding increasingly larger plots (Fig. 3). Towards the lower reaches of the valley seasonal runoff

¹³ M. J. Grolier puts forward a hypothesis on the appearance of irrigation in the lowlands, which he considers to be related to the settlement of farmers emigrating from the Yemeni highlands in the Bronze Age; M. J. Grolier, “A Geomorphic Inquiry into Seil Processes and Seil Irrigation Farming in the al-Jadidah Basin of Wâdi al-Jubah, Yemen Arab Republic”, in Grolier *et al.*, *Wâdi al-Jubah*, 18, 40 ; see also Brunner, “Débuts”, Michel Mouton, “Irrigation et formation de la société antique dans les basses-terres du Yémen : un essai de modèle” *Syria* 81 (2004), Wilkinson, *Landscapes*.

¹⁴ Alfred F. L. Beeston, “Functional Significance of the Old South Arabian “town””, *Proceedings of the Seminar for Arabian Studies* 1 (1971), 26-28, 27.

¹⁵ Noticed during the survey carried out by the French archaeological expedition in the wâdi Markha (unpublished); also recorded in the wâdi Surban, see “Les structures d'irrigation du Wâdi Surbân au Yémen”, *Proceedings of the Seminar for Arabian Studies* 30 (2000), 87-97, 87; in the al-Jubah basin, see Grolier, “Geomorphic”, 38-39; in wâdi Mundah, see Ueli Brunner, “The History of Irrigation in the Wâdi Markhah”, *Proceedings of the Seminar for Arabian Studies* 27 (1997), 75-86, 78.

is scarcer and had to be compensated for by larger and larger areas of cultivation which allowed the production of substantial surpluses: the annual flooding sometimes reaching the irrigation canals in valley mouths only once every other year.

This technique was nothing more than common sense¹⁶. It was the first stage in the creation of hydrographical networks by communities seeking solutions to the restrictions caused by insufficient rainfall. In the Spanish Levant, for instance, stone walled terracing first appeared during the Iberic period, long before the introduction of Roman and Arab technology¹⁷.

Only part of the flow, very strong in the upper parts of the valleys, could be diverted. And the constructions were frequently destroyed, preventing fields and soil from being washed away. Nevertheless, their simplicity and modest dimensions facilitated both their maintenance and even their total reconstruction when necessary (courses of large stones, piers of upright slabs). Runoff being more frequent than in the lower parts of the great valleys, fields could be watered several times a year and could yield more than one harvest a year. The area under cultivation could be therefore much smaller for a given population than in the lower reaches of the valleys where a larger area had to compensate for the very low frequency of floods.

This installation of people in the upper courses of valleys enabled the community to completely control flooding, and settlers could thus freely monopolize all the water that they needed. Since the model proposed is that of communities settling first at the headwaters of tributary wâdis, in the early phase no other population group settled either upstream or downstream on the same watercourse. Each human settlement therefore had a “monopoly over a flood” of sorts. Water was not shared, and thus could not be a source of conflict. Each community benefited from a clearly delimited catchment area and geographical and social territory. One territory, one community, one watercourse.

When a second, then a third community settle along the same watercourse, all relationships between them are going to be above all based on the sharing of water. This resource is vital for the survival of each population group, since, as we have said, the climate of the Yemeni lowlands is semi-arid. Yet installations lower down have to make do with water left over by communities located further upstream. One might think that the seasonal flood is in general quite enough to supply all irrigation systems constructed in the entire valley, but the reality is that, more often than not, the flow is insufficient to reach the installations built downstream. Many of the scholars who have focused on the study of flashflood irrigation systems have emphasized the importance of the derivations, which absorb a large amount or almost all of the volume of water¹⁸. Additionally, one should bear in mind that the irregular frequency of the floods, being a factor of major uncertainty, would have generated an over-consumption of water by each successive community¹⁹.

¹⁶ Pierre Gentelle, “Les irrigations antiques à Shabwa”, *Syria* 68 (1991), 5-54, 12.

¹⁷ André Bazzana, Pierre Guichard, “Irrigation et société dans l’Espagne orientale au Moyen-Age”, in: *L’homme et l’eau en Méditerranée et au Proche Orient I*, Jean Métral, Paul Sanlaville eds., Lyon: Maison de l’Orient / Presses Universitaires de Lyon 1981, 115-140, 120.

¹⁸ Pierre Gentelle in Breton, Arramond, Coque-Delhuille and Gentelle, *Bayhân*, 79; Grolier, “Geomorphic”, 39; Jürgen Schmidt, “The Sabaeen Irrigation Economy of Marib”, in: *3000 Years of Art and Civilization in Arabia Felix*, Werner Daum ed., / Franckfurt am Main: Pinguin and Umschau 1988, 55-62, 57; Jocelyn Orchard, “Finding the Ancient Sites in “, *Journal of Near Eastern Studies* 41/1 (1982), 1-21, 15.

¹⁹ Adams, “Historic”, 1, with specific reference to.

In modern , traditional irrigation laws almost systematically give precedence to communities settled upstream²⁰. In my opinion, this is a strong indication of a population movement from the upper reaches of the wâdis downriver: groups will never allow the settling of new inhabitants in areas where the latter are at an immediate advantage, even if the newcomers are directly related in terms of kin. This process would lead to conflicts and its outcome could be successful only when communities living further downstream are forcefully subjugated²¹. Such a model cannot be taken into consideration in the case of a “natural” progression of settlement, resulting from the segmentation of pre-existing communities. It can only be either the product of colonization by a foreign group establishing itself with military support, or the result of planning by a dominant and respected political power. An additional indication of the direction of settlement is given once more by traditional law: the age of the fields is taken into account, the oldest ones being served first when the floods come²². Had the earliest village installations (and therefore the most ancient fields) been located in the lower parts of valleys, this rule would have been in contradiction to the other main rule giving priority to settlers further upstream. This would have made conflict resolution difficult.

The gradual settlement of a valley assumes agreements between established communities, a prerequisite for the stability essential to the creation of hydraulic installations making possible the cultivation of the fields necessary for their survival. Villages downstream had to accept that the “thirst quenching” of their fields could only take place when all settlements located upstream had irrigated theirs²³. Bonds between villages had to be very strong. Those bonds founded on the sharing of water resources brought together population units which subsequently coalesced into a community acknowledging a common identity. Villages distributed along the same water course, sharing the same vital resource, would have had the sense of belonging to an interrelated group. This network of villages, along with their cultivated and grazing lands, outlines the borders of a territorial identity.

The relationship between various forms of water and territorial control on the one hand, and the formation of tribal societies on the other, has often been highlighted.²⁴ Each

²⁰ Frédéric Pelat, “L’intrusion de l’Etat dans les droits d’eau au Yémen : le temps des coutumes serait-il révolu?”, in: *Le Cheikh et le Procureur. Systèmes coutumiers, centralisme étatique et pratiques juridiques au Yémen et en Egypte*, Baudouin Dupret, François Burtat, eds., Le Caire: CEDEJ 2004, 247-274, 251-252. The everlasting character of many traditions in , acknowledged in many fields, renders very plausible the antiquity of those recorded in mediaeval treaties.

²¹ Obviously, the settlement of a group in an uninhabited valley does not result in a conflict of interest, even in later periods; this situation is described in the inscription from Riyam G1 the highlands: Jacqueline Pirenne, “La juridiction de l’eau en Arabie du sud antique d’après les inscriptions”, in: *L’homme et l’eau en Méditerranée et au Proche Orient, II. Aménagements hydrauliques, État et législation*, France Métral, Jean Métral, eds., Travaux de de l’Orient n°3, GIS, Lyon: Maison de l’Orient / Presses Universitaires de Lyon 1982, 81-102, 97.

²² Pelat, “Intrusion”, 252.

²³ Some more complex distribution rules, however, attempt to compensate for the relative advantage of irrigation works located upstream by devising staggered calendars, or by defining an order of precedence integrating the set of networks within a valley; see: Pellat, “Intrusion”; Ingrid Hehmeyer, “The spirit of cooperation in yemeni agricultural practices - successful cases from the past and their applicability for the present”, in: *Indigenous Knowledge and Sustainable Agriculture in Yemen*, Amin al-Hakimi, Frédéric Pelat, eds., Sanaa: CEFAS 2003, 94-98.

²⁴ For instance, with reference to the Yemeni highlands: Daniel M. Varisco, *The Ard in Highland Yemeni Agriculture*, Tools and Tillage 4/3 (1982), xvi; on the matter in : John C. Wilkinson, *Water and Tribal Settlement in . A Study of the Aflaj of* , : Clarendon Press 1977.

group can be distinguished from another by specific traits, since each is the product of isolated and autonomous development. All assert their specific identity in relation to that of other people with whom they are in contact but who do not belong to their own “water community”. Floodwater management presupposes common practices based on intuitive geometry and on restrictive social rules²⁵. The appearance of rules for water distribution is a gradual phenomenon, linked to the learning of collective management practices and trial and error in the evolution of regulatory mechanisms²⁶. Once more, observations made in the valleys of modern are a source of information on ancient periods. Nowadays, the variety of words designating operations related to water management in each valley shows the territorial character of these practices, something which has led to the multiplicity of management systems, most often existing within the confines of a single wâdi²⁷. This variety, the end-result of an evolution of techniques, habits and speech lasting thousands of years, testifies to the territorial fractioning of hydraulic expansion.

So, the initial phase of group cohesion along a same water course took place in two stages, the first being represented by single settlements near the headwaters of a wâdi, then the second by villages progressively occupying a complete tributary valley. This second stage culminated in the foundation of a settlement at the mouth of the tributary valley, but on the main valley floodplain. The agricultural territory around this newly-built centre was initially irrigated from the runoff descending from the tributary valley, i.e. the place of origin of the inhabitants. But once settled in the middle of the central valley, and in possession of technical expertise acquired during generations, the new settlers took the decision to harness its floodwaters. This is the second phase of group integration: in order to benefit from this water running from the whole catchment area, each community is under the obligation to share it with all the others settled in the entire hydrographical basin, even though these neighbouring populations do not have a common history, common ancestors, nor maybe the same cultural practices or deities. Common rules on the division of water resources have to be drawn up and agreements have to be respected for the preservation of the gradually developing hydrographical networks.

Irrigation systems in developed progressively and survived for centuries because populations were aware of their collective interests. Their management was founded on principles of community-based self-regulation: the imposition of central political authority was an external phenomenon, the result of independent decision-making, and not in response to a particular need expressed by local communities. This is the case in mediaeval and modern times, and probably also in antiquity²⁸. Modern legal anthropology states that the respect for tradition is based on the principle of reciprocity expressed by B. Malinowski²⁹. However, in our particular case, this principle seems not to be applicable. Yet respect for the rules on the division of water runoff from seasonal floods is based on this very principle: nevertheless, one is dealing here with “chain reciprocity”, as each community settled downstream has to abide by agreements for the sake of the stability of the entire valley group. Indeed the respect shown by one community for the rights of those living further upstream guarantees that a similar respect will be shown to it by those living

²⁵ Pierre Gentelle, *Traces d'eau. Un géographe chez les archéologues*, Paris: Belin 2003, 119.

²⁶ Thierry Ruf, “La gestion collective de l’eau. Histoire comparée entre le Roussillon et l’Equateur”, *Bulletin Interne (Institut de géographie de Lausanne)* 22 (2001), 147-159.

²⁷ Pelat, “Intrusion”, 250.

²⁸ Pellat, “Intrusion”, 257; Mikhail Rodionov, “Irrigation in western Hadramawt: khayyil as a social role”, *Proceedings of the Seminar for Arabian Studies* 29 (1999), 119-121; Hehmeyer, “Spirit”.

²⁹ Fieldwork carried out in ; Bronislaw Malinowski, *Crime and Custom in Savage Society*, : Routledge and Kegan Paul Ltd. 1926, en particulier 23-25.

downstream of it. Thus the force binding individuals or groups together and enabling social stability derives from relationships of reciprocal obligation: it is the reciprocity of these obligations which ensures the cohesion of the society³⁰.

Ritual practices ensuring social cohesion, such as the collective hunt and religious rituals for the worship of a tutelary deity, appeared in the Yemeni lowlands, at the latest, during this stage of South Arabian social evolution.

Hunts such as those carried out collectively by Yemenis since antiquity are a factor of intercommunity cohesion. Moreover, both in the distant past and today, these activities are closely associated with rites aimed at ensuring adequate rainfall³¹, leading us back to the major concerns which cemented these communities in past times. The menfolk of different villages, different valleys or from different tribes would gather in areas located outside the land owned by each particular group, in places of free passage, in order to hunt together and to meet around collective meals, to establish agreements and resolve their differences.

It is likely that these meals were loaded with religious significance. And that brings another element of cohesion, since the common god is to become the supreme judge of the community. In the classical period, each kingdom had its own 'national' deity cementing the tribal identity. Each man was defined by his function within a group, and his position was the result of genealogy, territorial links or, even better, of a combination of both. Groups were then bonded by worship of a common divinity. The recognition of a tutelary deity by all communities settled in all the tributaries of a hydrographical basin must have been a gradual process consolidated over the years by a long succession of ritual practices. The group's identity would have taken shape around this god's cult, as would the myths of the origins of traditions and rules, whose respect was secured through fear of angering invisible powers³².

Progressively, various people were appointed, or commanded sufficient authority, to be the representatives of the communities, to solve the disputes related to the distribution of water (an increasingly complex matter): the "water masters", the *nadarr* mentioned in South Arabian inscriptions, the *shaykh al-sharaj* of present-day villages. It is the large size of a group, not the requirements of a hydraulic system, which engendered the formation of political authority. But on the other hand, central power then attempted to control the entire network or at least part of it, if only to ensure the steady supply of water to land which little by little it took over³³. This political power was reflected by the development of a major site at the mouth of each valley, a social culmination resulting from the unification of all segments within a hydrographical basin³⁴. This site, capital of a population now possessing a strong sense of identity, was both the merging of all its

³⁰ N. Rouland, *Anthropologie juridique*, Paris: P.U.F. 1988, 72.

³¹ Alfred F. L. Beeston, "The Ritual Hunt. A Study of Old South Arabian Religious Practice", *Le Muséon* 61 (1948), 183-196; R. B. Serjeant, *South Arabian Hunt*, : Luzac & Company Limited 1976.

³² Rouland, *Anthropologie*, 190-191.

³³ See the details of the model suggested for the evolution of irrigation in the Yemeni lowlands, proposed in Mouton, "Irrigation".

³⁴In the Jawf, the situation is quite unique. The irrigation network of Baraqish depends on the floodwaters of wâdi Majzir. The city of Nashq was possibly the centre of a kingdom during a later period, but was first subjected to the power of Nashshan, then of Saba'; its irrigated territory was fed by the wâdi al-Buhayra, as is that of Nashshan; Jérémie Schiettecatte, *Villes et urbanisation de l'Arabie du Sud à l'époque préislamique. Formation, fonctions et territorialités urbaines dans la dynamique de peuplement régional*, PhD, Université de Paris I Panthéon - Sorbonne 2006, 120-123, any case, irrigation systems are nowhere described precisely

constituent groups and also the gateway to communication routes with other communities in the neighbouring valleys. These capitals were indeed founded where population increase reaching urban levels was facilitated by a proportionally-sized and intensively cultivated landscape (farmers were a large part of the urban population). Some of the larger areas in the tributary valleys would have supported such settlements, but the choice of locations giving access to trans-Arabian and regional thoroughfares are quite deliberate (Fig. 4).

The process of integration cannot continue forever based on the principle of sharing the collective interests of a group, since, for each of these centres, extending their influence any further implies advancing beyond their territorial borders and imposing their authority on other communities. Henceforth territorial expansion will be based on annexation and domination, by imposing an authority founded outside the history and mythologies of these groups.

Reference to this notion of authority from outside a particular community can be significant in the search for the meaning of the term *mukarrib* used by the expansionist rulers of ancient South Arabia.

However let us first examine the case of the Hadramawt.

The Hadramawt is a plateau constituted of Palaeocene and Eocene limestone incised by numerous wadis. These descend towards a central valley enclosed by vertical cliffs high, whose erosion in places leaves a jumble of boulders. The western part of this valley, which opens onto the Ramlat as-Sab'atayn desert, is several kilometres wide, while the lower course, deeper and narrower, flows to the east, reaching the Indian Ocean at Sayhut (Fig. 1 and 5)³⁵. Very localized and very heavy rainfall is characteristic of this region³⁶. The seasonal runoff of the wadis is fed by a less mountainous and less well watered hydrographical network than in the Yemeni highlands, but is nevertheless sufficient for the development of irrigated agriculture.

In this region, the formation of irrigation networks is comparable to what has been observed in the other lowland valleys. The settlement pattern is also similar. The earliest hydraulic installations are diverting constructions built on lower slopes and gullies, numerous in small tributary valleys that supplied the fields on the natural alluvial terraces. Similar irrigation works on the plateau have been attributed to the fourth millennium BC by J. McCorriston, due to their stratigraphic relation with silt strata³⁷. In the valleys, the oxidation of stones and, above all, the depth to which they were buried, testify to their antiquity: in several cases (wadi Sukhûra, wadi Mshîr), these arrangements have been found preserved under the silts deposited by ancient irrigation, and which therefore pre-date the installations of the "classical" networks dating back to the latter half of the second millennium and throughout the first millennium BC (Fig. 6).

A.V. Sedov has placed the foundation of Raybûn somewhere in the last quarter of the second millennium BC. The pottery assemblage of the most ancient phase of this urban

enough so as to know from which particular wadi the floodwater was drawn. Ch. Robin alone distinguishes between the sites "founded on the wadi Madhab" (central course), Kamna / Kaminahu, Kharibat Hamdan / Haram, Ma'in / Qarnaw, and, somewhat apart, al-Bayda' / Nashq, as-Sawda' / Nashshan and Inabba' / Inabba'; Christian J. Robin, "Des villes dans le Jawf du Yémen?", in: *La ville, d'après les sources épigraphiques et littéraires ouest-sémitiques de 1200 avant J.-C. à l'Hégire, Semitica* 43-44 (1995), 141-161, 143- the absence of any more details, we are forced to admit that four kingdoms would have shared the same watercourse (Kaminahu, Haram, Ma'in et Inabba').

³⁵ Sanlaville, *Moyen-Orient*, 137-138.

³⁶ Breton *et al.*, *Bayhân*, 78 ; Coque-Delhuille and Gentelle, "Crues", 102.

³⁷ OSL dates of silt deposits: Joy McCorriston, "Ancient agricultural practices in Hadramawt: new insights from the RASA Project", in: al-Hakimi and Pelat eds, *Indigenous*, 19-25, 21-22.

centre has also been found in many other sites in the main valleys of the Hadramawt (for instance as-Safil II and III in the wâdi al-‘Ayn, Mashgha and Salasala in the wâdi ‘Idîm). But the sites built at the mouth of the small valleys, at the foot of escarpments, appear to be older than those founded at the centre of valleys³⁸. The latter, defined culturally as “South Arabian”, are contemporary with the irrigation networks radiating from diversion banks gathering the runoff from the centre of the valleys. This runoff, directed towards the widest areas of the valleys, most often near the confluences, fed agricultural land around small villages and then the fields around larger centres like Makaynûn.

This site is a good example of the settlement of the central valley.³⁹ Inhabited right from the start of the first millennium BC, it appears to have been the urban centre of a territory formed by the wâdi valleys opening around onto the Masîla: four valleys on the left bank (including two that can be cultivated for more than upstream) and a large valley on the right bank where the floodwater from several tributaries was diverted. In each of these wâdis, archaic hydraulic installations were discovered on the lower slopes, and a few small protohistoric installations, but also larger hydraulic constructions made of masonry diverting seasonal runoff to cultivation zones situated at the confluence with the central Hadramawt valley and associated with South Arabian villages and sanctuaries (Fig. 7). Makaynûn was thus surrounded by small hamlets and converging canals carrying the water from the tributary valleys. All of its agricultural land was irrigated by the floodwaters of the tributary valleys around, the perennial runoff of the wâdi Masîla, the main river of the Hadramawt that flows right next to the site, never having been diverted. This is due to the fact that the bed of its watercourse was too deeply incised (Fig. 8). The geomorphological studies show that this incision is older than earliest settlement in the valley⁴⁰, and archaeological surveys have not revealed any diverting installation harnessing the water flow of this wâdi.

Along the entire central portion of the Hadramawt valley, every 8 to 10 km, sites with characteristics similar to those of Makaynûn are strung along the landscape, forming a chain of ancient regional centres. None of them has made use of the waters of the Masîla for their respective irrigation networks (Fig. 9).

To the west, the situation is similar. The wâdi’s flow is subterranean, and large sites such as Raybûn were built on the right bank tributaries (wâdi Do’an and wâdi ‘Amd). Settlements founded in the central part of the Hadramawt valley have their agricultural land irrigated from tributary watercourses. Such is the case at Bir Hamad, where a canal several kilometres long provides water from the wâdi Rakhia, a tributary on the right bank; and even further west, Shabwa, the capital located on the edges of the Ramlat as-Sab‘atayn, supplies its irrigation network with the floodwaters running from the wâdis ‘Atf and Irma.

³⁸ The chronology is based on the pottery assemblages and on C¹⁴ dates; Alexander Sedov, “On the origin of the agricultural settlements in Hadramawt”, in: *Antiqua. Early Origins of South Arabian States*, Christian J. Robin, Iwona Gajda, eds., Serie Orientale Roma LXX / 1, Roma: Istituto Italiano per il Medio ed Estremo Oriente 1996, 67-86, 68-80.

³⁹ Anne Benoist, Michel Mouton, Jérémie Schiettecatte, “Makaynûn, un centre régional antique dans le Hadramawt oriental”, in: *Sabaeen Studies. Archaeological, Epigraphical and Historical Studies in honour of Yûsuf M. ‘Abdallâh, Alessandro de Maigret and Christian J. Robin on the occasion of their 60th birthdays*, A. M. Sholan, Sabina Antonini, Mounir Arbach eds., Napoli / Sanaa: Il Torcoliere (University of Sanaa / Yemeni Italian Centre for Archaeological Researches / Centre français d’archéologie et de sciences sociales de Sanaa) 2005, 59-94; Michel Mouton, Anne Benoist, Jérémie Schiettecatte, Mounir Arbach, Vincent Bernard, “Makaynûn, a southarabian site in Hadramawt”, *Proceedings of the Seminar for Arabian Studies* 36 (2006), in press.

⁴⁰ J.-P. Bravard and J.-F. Berger, unpublished internal report.

To the east, the Masîla valley is too narrow and sunken to have allowed the development of large population centres.

In every case, the process of community integration took place based on the sharing of floodwaters from one or several tributary valleys of the Hadramawt, just as in each of the main valleys of the Yemeni lowlands. The rise of the centres located at the confluence of several wâdis, therefore reflects a degree of integration equivalent to that of the capitals of the lowland kingdoms.

Therefore, in the entire area nowadays called the Hadramawt, there was no process of gradual settlement by a single community united in the sharing of the same water source. So, the unification of the Hadramawt corresponds to a stage of integration socially and politically (but not historically) comparable to the Sabaean expansion beyond the wâdi Dana, or to that of the Qataban outside of the wâdi Bayhan. It implied domination by a single community or agreements between communities not sharing a consciously expressed common identity.

Without going into obvious differences in demographics and economics, it should be stated that, from the point of view of social anthropology only, the larger settlement centres of the interior of the Hadramawt, each with their own autonomous irrigation network, were on the same hierarchical level as the capitals of the kingdoms in the Yemeni lowlands. The valley of the Hadramawt is a central corridor along which political centres belonging to different communities were distributed in a way akin to that of the capitals of the kingdoms further west, all established along the edge of that other central space, the Ramlat as-Sab'atayn.

When analysed with reference to the notion of water sharing, the process of community integration and of territorial unification of the ancient lowland kingdoms seems very different from that of the Hadramawt (the name is used here in its geographical sense). These kingdoms were the outcome of a demographic and agricultural expansion, a social stratification and the formation of an identity based on the sharing of water resources. In the Hadramawt, this process stops at the confluence of the main tributaries, the central valley having never been a line of social cohesion and territorial unification. Settlements in the valley remained sharply divided, each community having built a specific identity which for a long time did not expand beyond the borders of the irrigated territory, of the sacred space as defined by the shrines of tutelary deities, or the limits of the urban community.

The existence of an ancient unified Hadramawt can therefore be questioned. The cities of the interior of the Hadramawt like Raybun, as-Safil, Huraydha, Suna, Masgha, or Makaynun have never yielded any shred of evidence of their integration within the sphere of influence of the king of the Hadramawt, whose capital was Shabwa. No inscription mentions allegiance to the king, nor is there any written material mentioning the presence of one of his representatives⁴¹. Sabaean and Himyaritic texts in fact call the region, known today as the Hadramawt, Sariran (*S'RR-n*) -i.e. 'the valley'-. The inscription Ir 32, dated to the 4th century AD, makes a distinction in lines 37-38 by referring to the cities of "the Hadramawt and Sariran"⁴². In Antiquity, the term Hadramawt was most probably used to describe the territory of the ; it is only in mediaeval Arab manuscripts that the name appears with the same geographical meaning as today. The king of the Hadramawt ruled Shabwa, an urban centre settled by one of the many communities formed over time, as described above, in one of the valleys of the Hadramawt plateau. In any case, had the city represented

⁴¹ Schiettecatte, *Villes*, 311; Serguei A. Frantsouzzoff, "The Society of Raybûn", in: *Alternatives of social evolution*, : Feb Ras 2000, 258-265, 259.

⁴² Frantsouzzoff, "Society", 260.

the culmination of territorial integration and development of community structure, its location near the western margins of the plateau would be surprising⁴³: unlike other capitals, Shabwa is situated in the upper part of the valley, far from most of the centres it was supposed to control. It is therefore obviously both its location on the inland trans-Arabian itineraries and its integration into the network of centres of power distributed around the desert of the Ramlat as- Sab'atayn that favoured this city's growth. It was precisely its role in the sale and export of aromatic resins harvested on the Hadramawt plateau and areas further east that was at the source of its influence on the region's communities: the city drained the wealth brought by trans-Arabian trade in the exchange of aromatic substances and political stability for their carriage.

This economic relationship between the and other population centres of the entire Hadramawt plateau has been interpreted *de facto* as a political domination. This interpretation was reinforced by the toponymical confusion between the ancient and the geographical and cultural namesake in the mediaeval and modern periods. The ancient was a community settled on the desert margins and included within the cultural horizon defined linguistically as the "Sayhad" by A. F. L. Beeston⁴⁴. The name does not refer to the territory over which it certainly brought considerable economic influence but which it only partially and occasionally controlled in a political sense, and in any case perhaps never before the Sabaean conquest in the 7th century BC ⁴⁵. Moreover, if no inscriptions discovered in the major centres of 'the valley' reflect the royal authority exercised by the rulers of the Hadramawt, one can surmise that, even in those times, the latter was only recognized as *mukarrib* and not as rightful sovereign⁴⁶.

Once again we find ourselves, therefore, at the threshold of territorial and political expansion, and of authority exercised over people belonging to different communities. Most probably, it was the crossing of this threshold which transformed a ruler into a *mukarrib*. Political power, developing for centuries in a "linear" fashion along a valley's watercourse, culminated in rulers adopting the title of "king" (*mlk*). By contrast, "transverse" power imposed from one valley on another was embodied by a *mukarrib*. Thus a ruler could simultaneously be his people's king and the *mukarrib* of subjected or allied communities.

The noun *mukarrib* appears to mean "unifier" or "federator", the root KRB expressing the idea of "unification"⁴⁷. The *mukarrib* was then the one who would gather under his authority various communities or kingdoms characterized by well defined territories, autonomous political structures, an individual identity and the cult of a tutelary deity. Ch. Robin suggests the existence, during the period of expansion of the Sabaean

⁴³ Alfred F. L. Beeston, "Hadramawt", *Encyclopaedia of Islam* new edition vol. 3, / : E. J. Brill 1982, 52-53.

⁴⁴ Alfred F. L. Beeston, "Apologia for "Sayhadic"", *Proceedings of the Seminar for Arabian Studies* 17 (1987), 13-14.

⁴⁵ The royal foundations of Khawr Ruri et Qani' were distant outposts related to the incense trade; the kings of Hadramawt also controlled some pre-existing centres such as Mayfa'at in the wādi Mayfa'at, a valley linking Shabwa to the Indian Ocean; see Schiettecatte, *Villes*, 287-305.

⁴⁶ The authority of Hadramawt's kings is acknowledged in inscriptions distributed around the city of , in the wādi Mayfa'at, which reaches the sea, and in the two ports of Qani' and Khawr Ruri, founded as the result of royal policy.

⁴⁷ Alfred F. L. Beeston, "Two Epigraphic South Arabian Roots : HY' and KRB", in: *Al-Hudhud. Festschrift Maria Höfner zum 80 Geburtstag*, R. G. Stiegner ed., Graz: Kark-Franzens Universität 1981, 21-34, 24; Christian J. Robin, "Sheba", in: *Supplément au Dictionnaire de* , Jacques Briand, Edouard Cothenet eds., Paris: Letouzey & Ané éditeurs 1996, fasc. 70, 1043-1254, 1048.

realm under Karib'il Watar, in the 7th century BC, of "two degrees of inclusion within Saba', the descent from the god Almaqah and the Union"⁴⁸. In my opinion, for the first group of people who claimed descent from the tutelary divinity the Sabaeen ruler was their king; the same ruler was regarded as their *mukarrib* by the second group⁴⁹.

Inscriptions do not argue against this interpretation⁵⁰. But it is accepted that the title *mukarrib* could have been used by only one ruler at a time in the area of the South Arabian civilisation; this would go against our interpretation. However certain elements do indeed seem to weaken the idea of a single titular federator.

In at least two cases, the coexistence of two *mukarribs* is attested: at the fall of Awsan, this kingdom's ruler bore the title of *mukarrib*, as did that of Saba'; in Abyssinia three sovereigns of the Tigrean plateau were also referred to as *mukarribs* at the time of the *mukarribs* of '. Moreover, nothing proves with certainty that the two *mukarribs* known in the Hadramawt were not contemporary with rulers bearing the same title in the Qataban⁵¹. Furthermore, the hypothesis of a sole *mukarrib* implies an awareness of a South Arabian cultural unity in a part of the world defined as a single identity. Such a concept of identity in the face of the rest of the known world, is not attested to in the archaeological and epigraphic evidence⁵².

And lastly, Almaqah's symbol is by some scholars related to the title *mukarrib*⁵³. It was the standard of 's tutelary god and therefore of the Maryab royalty. However, had such a symbol stood for a single South Arabian federating power, the *mukarribs* of Awsan, Qataban and Hadramawt would have also adopted it in their titular, something they never did.

In my opinion, the *mukarrib* appeared when political expansion reached beyond the borders of a valley. He was a unifier, with authority over communities which shared neither a common history nor tutelary deities because their origins were in different territories, in different hydrological basins. He intervened precisely in events aimed at forging cohesion, the treaties of union and the ritual practices such as collective hunts, banquets and religion.

By attributing a power of cohesion and social structuring to the notion of water sharing, it has been possible to establish a distinction between the degree of unification of the ancient kingdoms of the Yemeni lowlands and that of the Hadramawt region. The states bordering the southern margins of the Ramlat as-Sab'atayn desert grew in social complexity through the sharing of a common water resource, and hence developed a strong sense of identity cemented by social and cultural practices. They progressively integrated (in a broad sense) the different groups in the valley, a process resulting in the formation of a stratified society ruled by a king. In the Hadramawt region, the segmented character of the watercourses did not lead to the same kind of sharing, and consequently did not produce the essential relations and agreements between the communities and the gradual

⁴⁸ Robin, "", 1091.

⁴⁹ This difference in titulary could explain why subjects belonging to the ruler's community and "country" never use the title *mukarrib* when referring to him: he is their king, their ruler, and not a *mukarrib* whose authority they recognize in a union pact or as a result of unwilling subjection. The link between union pacts and the *mukarrib* has been suggested by Ch. Robin, who adds that this relationship remains to be proven; Robin, "", 1181.

⁵⁰ See the detail of the references in Robin, "", 1125-1156.

⁵¹ Robin, "", 1150-1151 and refs.

⁵² Schiettecatte, *Villes*, 22. There is no term designating as a whole, see Alfred F. L. Beeston, "Towards a Periodisation Terminology for Ancient Yemen", in Robin and Gajda eds *Arabia Antiqua*, 3- strong sense of identity, however, was perceptible in each kingdom or state, as emphasized by A. Avanzini for Qataban: Alessandra Avanzini, *Corpus of South Arabian Inscriptions I-III. Qatabanic, Marginal Qatabanic, Awsanite Inscriptions*, Arabia Antica 2, : Edizioni Plus 2004, 22.

⁵³ Robin, "", 1156 and refs.

forging of a single identity. This is confirmed by the archaeological evidences: traces of a durable political unification are absent, regional centres are many, and the bases of royal power appear to have been far-flung. The of was probably limited to the valleys in the vicinity of the city of . And when the king of Shabwa extend his authority over the region of the Hadramawt, his power had reached beyond the borders of his land. This authority beyond one's own community and territory is probably the essential notion characterizing the title of *mukarrib*.

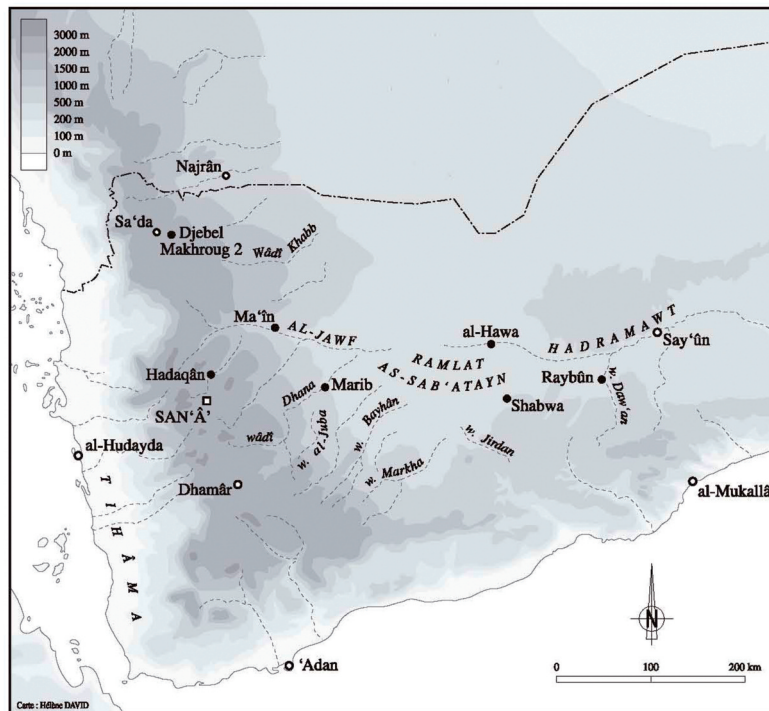


Fig. 1 Main sites in the lowlands of in Antiquity.



Fig. 2 Hydraulic installations in a tributary valley (wadi Markha).



Fig. 3 - Hydraulic installations in the central valley (wâdi Markhâ).

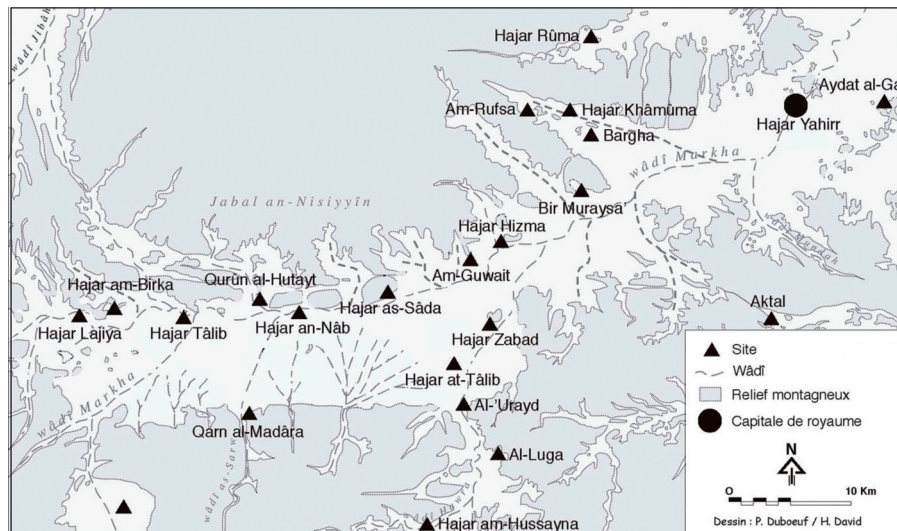


Fig. 4 Distribution of the main sites in wâdi Markhâ (U. Brunner).

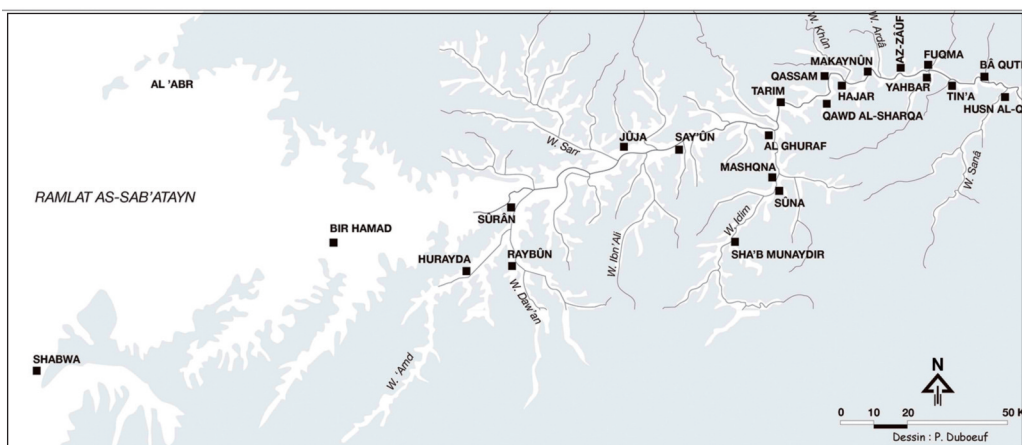


Fig. 5 Sites in the wâdi Hadramawt.