

The ecology of the *mudhif*

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Abstract

If Eco Architecture is a matter of designing with nature then the Sumerian *mudhif* is a paradigmatic example. It was first built in the marshes of what is now southern Iraq, over 5000 years ago, and constructed entirely of reeds, to form huge parabolic arches over which reed mats were tied to form walls, curving over into roofs whilst the flat end walls had reed lattice panels for the admission of daylight and air. The *mudhif* was built and used, by the Marsh Arabs of the region, until 1993 when Saddam Hussein began to drain and dam the marshes, in an attempt to destroy the life and culture of those Arabs. But after his defeat in 2003, the Arabs dug up his dykes, canals and dams, re-flooded the marshes and began to resume their ancient way of life.

Keywords: Sumerian, mudhif, reed construction, lattice panels, Marsh Arabs.

1 Development of the *mudhif*

The most immediate ways of interacting with nature of course is to design for both climate and topography, using local resources to make ourselves comfortable by means of the building itself, with a minimum involvement of mechanical devices. The earliest known example of such construction still in use is the Sumerian, reed-built *mudhif* which is also one of the oldest known monumental building types.

These *mudhifs* were built by the culture which not only developed the world's first cities, with their great mud-brick ziggurats and temples; it also invented writing, for the keeping of temple records. And of course, for sustenance, the cities had to be surrounded by agricultural villages hence, in the marshes, buildings constructed entirely of reeds.

Carved elevations of the latter have been found, on temple walls and a carved gypsum trough from ancient Uruk, dated to c 3,200 BC and now in the British Museum (WA 120000). This shows an elevation of a typical *mudhif* with



bundles of reeds bent into parabolic arches, aligned along an axis and thus, internally, receding majestically in perspective like the arches of some great Gothic cathedral. Not only were the arches of the *mudhif* made of reed bundles, their side walls also, curving over into their roofs and their flat facades were formed of reed mats and, in some situations the latter might be fronted by imposing reed-bundle columns. Between these there might be reed lattices with small vertical, square or diagonal openings to admit controlled daylight but, more particularly, air. The lower parts of the walls also might be so-latticed or at least the lower mats could be raised to admit through breezes. Which indeed could be rather strong!

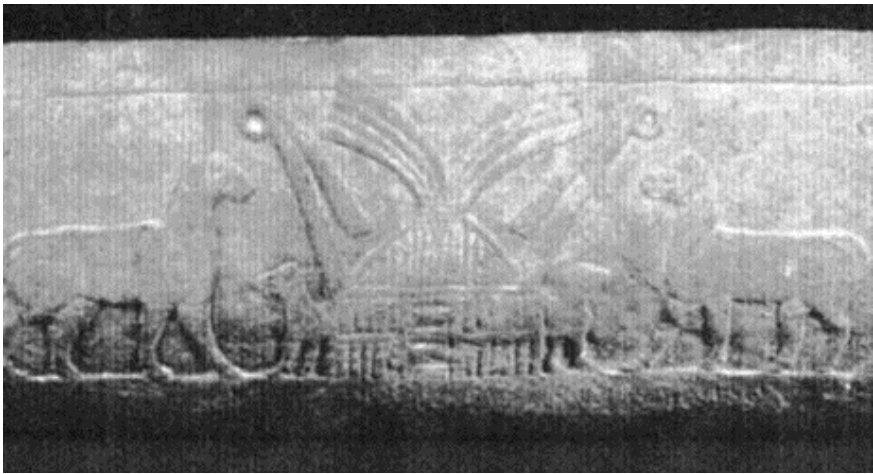


Figure 1: Sumerian *mudhif* façade, with uncut reed fronds and sheep entering, carved into a gypsum trough from Uruk, c 3,200 BC. (© British Museum WA 12000.)

J. B. Fraser seems to have been the first westerner to describe the *mudhif*, in his *Mesopotamia and Assyria* of 1842 [1]. He writes of the Euphrates, flooding to a width of 60 miles near Lemlun and of people in canoes, or even on foot, following their floating villages in order to recover the materials [2]. He doesn't think much of the "human animals" who lived in these "dens," since they "bore...as much of the appearance of the dregs of the human species as can well be imagined" [3]. For them, inherently nomadic, "the prejudice against a fixed life is strong, only the lowest of the tribe will condescend to remain stationary; but change is in progress" [4].

The sheiks, however, had their own portions of land, regarding these as their chief means of subsistence, cultivated by peasants they obviously despised. And they built reed villages on the banks of the Euphrates, "superceding the black hair tents of the Bedouins." Many of the houses were constructed "with great taste" [5].

The mode of building is simple enough: clusters of reeds from fifteen to twenty feet high are neatly bound with withes or bands...and planted in the

ground...in two rows, like posts. The small ends are then bent till those of the opposite cluster in each row meet in the form of an arch, when they are fastened together by smaller bundles, laid longitudinally on the roof and tied to each post. This framework is covered, both sides and roof, with mats made of the split reeds, and ornamented with neat lattice-work, according to the fancy and skill of the architect [6].

Fraser found these more comfortable than the Arabian black tent, but still saw it as a strange piece of affectation to prefer such flimsy structures to the more solid houses, built of clay, which the village peasants occupied, merely because reed-building implied a lesser deviation from nomadic habits. He by no means describes the functions of these larger buildings but he is impressed by the hospitality. There was a hearth in the centre where the cawachee took his seat, having before him a large row of coffee-pots from which small cups were soon served; such a “dose” being repeated every ten minutes or so. It was good coffee too, flavoured with cardamom [7].

2 20th century explorers

Fraser could not have known the historic significance of the *mudhif* but later writers were rather more sympathetic. Gertrude Bell, an ardent Arabist, traveller, explorer, mountaineer, photographer, linguist, scholar, writer, spy, diplomat, and archaeologist – indeed it was she who founded the Iraq Museum – sent some of the first 20th Century descriptions in 1917 [8]. Mesopotamia was then quite new to her and she describes Sulat Sahib in a letter: “it was a delicious warm day and the river was delightful. I don’t know why it should be as attractive as it is. The elements of the scene are extremely simple but the combination still makes a wonderfully attractive result. Yet there’s really nothing – flat, far-stretching plain coming down to the river’s edge, thorn covered, water-covered in the flood in the lower reaches, a little wheat and millet stubble in the base fields, an occasional village of reed-built houses.”

In 1918, Bell sent her first photographs of *mudhifs* to England and in 1920; she described one in a letter to her father [9].

after dinner [Sheikh Ibadi al Husain] invited us to his mudhif, his guest house. Now a mudhif you can’t picture till you’ve seen it. It’s made of reeds, reed mats spread over reed bundles arching over and meeting at the top so that the whole is a huge, perfectly regular and exquisitely constructed yellow tunnel 50 yards long. In the middle is the coffee hearth, with great logs of willow burning. On either side of the hearth, against the reed walls of the mudhif, a row of brocade-covered cushions for us to sit on, the Arabs flanking us and the coffee-maker crouched over his pots. The whole lighted by the fire and a couple of small lamps, and the end of the mudhif fading away into a golden gloom. Glorious.

But by that time Bell had other business in hand. Indeed, by 1919, she knew and understood Mesopotamia so well that she, along with T E Lawrence (of Arabia) became advisor to the British Government – in the person of Winston Churchill – as to how a newly established country, Iraq, should be set up within it. Mesopotamia had been part of the Ottoman Empire but since the latter’s



demise in 1918, partly because of Arab revolts – encouraged by the British – but also because Turkey had been allied to Germany during World War I. Britain and France had agreed – secretly – to supervise the Empire’s dissolution and it was Bell indeed who at a Conference in Cairo (1921) actually mapped the boundaries of Iraq on a sheet of tracing paper [10]. She envisaged a Shi’ite minority in the south, a Sunni majority in the centre and a Kurdish minority to the north. By denying the Kurds a separate, autonomous state she intended that a balance of power be kept with the huge predominance of Sunni in Iraq as a whole and, indeed, to keep control of Iraq’s potential oilfields. Bell and Lawrence even persuaded the Cairo Conference to endorse Faisal bin Hussein (son of Hussein, Sheriff of Mecca) as the first King – Faisal – of Iraq.

But it was Gavin Maxwell [11] who in 1957 (1969 in the UK) introduced the *mudhif* structures to a wider western readership. He’d been in the marshes with Wilfred Thesiger, but Thesiger went on to live with the Arabs for several months every year except one between 1951 and 1958 so it’s hardly surprising that his *The Marsh Arabs* of 1964 finally captured the public’s imagination [12]. His philosophy, I suppose, is a model for all green campaigners, eco-warriors, sustainable city designers etc. He says: “I loathed cars, aeroplanes, wireless and television, in fact most of our civilization’s manifestations in the past fifty years and was always happy, in Iraq or elsewhere, to share a smoke-filled hovel with a shepherd, his family and beasts” [13].

The siger describes his first visit to a *mudhif* [14]:

Kicking off my shoes, I passed between the pillars. Eight feet in girth, each pillar was formed of by a bundle of giant reeds, the peeled stems bound so tightly together that the surface was smooth and polished.

The great hall smelt acrid with smoke and the light was dim, after the bright sun outside. Shadowy figures stood against the walls...We seated ourselves on some gaudy rugs spread on the matting and others seated themselves along the walls...Against the wall at the far end was a wooden chest and near the entrance a large pitcher of porous clay filled with water and supported on a wooden frame. There was no other furniture. The hearth was a third of the way into the room and in the centre. Here beside a small fire a dozen coffee-pots were ranged, the largest about two feet high ...Fresh coffee, brewed in the smallest pot, was always prepared on the arrival of any guest of importance. An old man busied himself making it in conformity with a time-honoured ritual. As soon as the beans were roasted, he ground them in a small brass mortar, beating out the rhythm as he did so. This pleasant sound was an intimation that coffee was being served in the chief’s guest house, and an invitation to any man within hearing to partake

The coffee, of course, was served with considerable ritual. The canoe-men who had brought Thesiger to the *mudhif* were offered tea. There were, says Thesiger, long silences in the conversation, by no means embarrassing to the Arabs. But then, after a while, the Sheikh:



occupied himself once more with the morning's business, for these *mudhifs* were more than guest houses; they were the audience chambers where the sheiks sat morning and evening, running their estates and settling disputes between their tribesmen [15].

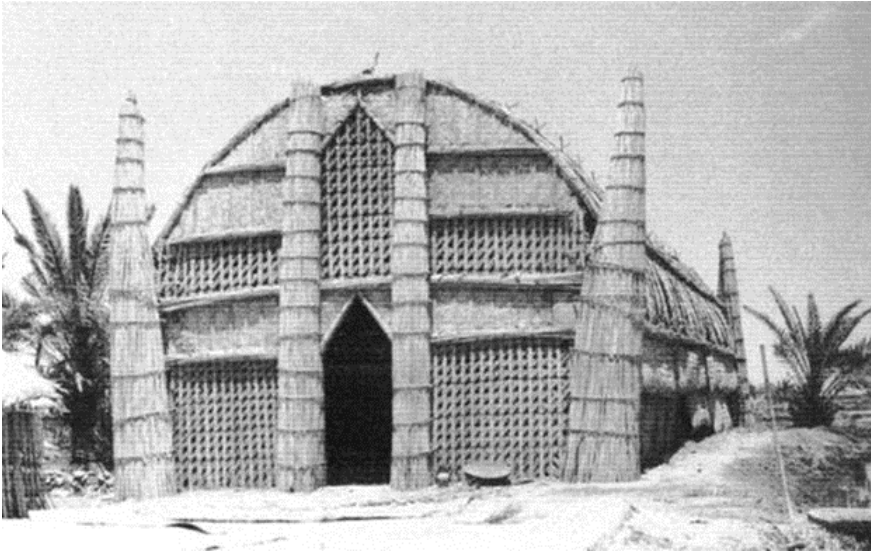


Figure 2: Wilfred Thesiger, early 1950s, photograph of a Marsh Arab's *mudhif*. (© Courtesy Pitt Rivers Museum Oxford.)

Two unlikely nuisances plagued the *mudhifs*. As Thesiger says (p. 123), bats with their droppings and sparrows which unpicked the bindings around the arches!

It was Ochsenschlager, however, an archaeologist [16] who noted extraordinary parallels between the lives of the Marsh Arabs and those of their Sumerian forebears some 5000 and more years earlier he was excavating from 1968 to 1988 at Lagash, east of Uruk and north-west of the junction between the rivers Tigris and Euphrates. The parallels he noted between Mi'dan – Marsh Arab – and Sumerian lives included fishing with spears from narrow boats – reed for the Sumerians but sometimes wood for the Mi'dan – keeping water buffalo and, having made floating islands of reed mats interspersed with earth or mud, building on them, in exactly the age-old way [17].

In 2004 indeed Ochsenschlager, [18] describes one of the larger *mudhifs* as 21 metres long, seven metres wide and 15 metres to the peaks of its arches. He also describes the construction of a much smaller version for his own expedition's use, but even there the lower diameter of the reed arches was three "forearms" and the upper "two handspans." Actually the builders seem to have been using the ancient Egyptian system of measurement in cubits – elbows to fingertips, palms – hand widths – and fingers. *Mudhifs*, traditionally, had been built to serve the purposes, almost, of Roman basilicas – places where justice was dispensed.

But in Ochsenschlager's time they were community halls where the men of the village – never the women or the children – would seat themselves according to strict hierarchical rules and follow strict, hierarchical procedures, including the serving of coffee, with anything but extremely serious conversation entirely banned; village disputes would be resolved; the payment of a bride price agreed, political, social and religious affairs discussed. Visiting travellers would be admitted, and indeed entertained quite lavishly – probably with a whole sheep, including the eyes – but, since they were expected to sleep in the *mushif*, those visitors would have to stay up until everyone else had gone home to bed before retiring for the night.



Figure 3: Wilfred Thesiger, (early 1950s) Interior of a *mudhif* with the cawachee and his coffee pots. (©Courtesy Pitt Rivers Museum, Oxford).

Reed construction obviously presented its problems. If the reeds were recently cut, and still soft, even a parabolic arch might collapse. So it was usual to use old and seasoned reeds as a core to any new arch. And a reed-mat roof, obviously, would be fairly porous until it got silted up with dust, debris and blown sand. Mud might be applied to speed up its water-resistant properties.

There were, of course, smaller structures; the five bay raba with entrances at both ends and a screen, or bench, to divide the family dwelling space from other accommodation, which might have been used for guests, or even animals in inclement weather. But such accommodation seems to have been noisy, with all aspects of family life, including arguments, overheard not only by the guests but by the neighbours. And there was also the *bayt*; a single room dwelling with, obviously, no space for guests. Mud brick or pise houses, actually, were

sometimes built alongside these reed houses – as status symbols – but the latter still had advantages in that if, given melting snow in Turkey, the marsh rose to unusual levels, a reed house could be untied and re-erected on higher ground [19].

3 **Sadam's destruction of the marshes**

So of course Ochsenschlager, deplored the ways in which, after the first Gulf War in 1992, Saddam Hussein had decreed that, since many opponents of his regime, and deserters from his army, had taken refuge in the Marshes the latter had to be drained; the villages bombed and burned. Of 500,000 Marsh Arabs, perhaps 100,000 took refuge in Shi'ite Iran and another 100,000 in sympathetic parts of Iraq and other parts of the world.

Alwash, Director of the Iraq Foundation [20], takes up the story in 2003. It had been estimated by them and others, from satellite images, that in the 1970s the marshes covered some 6,000 to 8,000 square miles but by 2000, some 80 to 90 per cent of these had been drained. Even in the 1980s, the 500,000 marsh dwellers shared their extraordinary habitat with 20 foot high reeds, grains, grasses, fish, water buffalo and migratory birds. But by 2003, when Saddam was overthrown, only a massive network of man-made canals and parched, salty, infertile earth – perhaps even desert – remained. Saddam's destructive processes actually had been preceded by major river dammings in Iran, Syria and especially Turkey, but when asked why Saddam wanted the marshes to be destroyed entirely, Alwash explained that according to Iraqi military documents, captured in 1991 he, Saddam, as early as 1987, had planned the construction of canals to dry-out the marshes for his punitive purposes.

And in April 1991 Saddam's Ba'th party newspaper al-Thawra published a series of articles attacking the Marsh Arabs for impeding progress and their alleged immorality, describing them as a 'monkey-faced' people who are not 'real Iraqis' at all [21]. Shades, indeed, of Fraser!

And so the attacks began [22]; incendiary bombings of the houses and indeed the reed beds. Water buffalos were slaughtered, earthen dykes built to stop the natural flow, the water poisoned and mines laid. Above all there was the extremely damaging drainage; the rivers Tigris and Euphrates were diverted by huge systems of canals, dykes and dams; firstly the Glory River, a canal two kilometers wide built in 1993 to intercept water from the Tigris, bypassing the marshes and draining water into the Shatt-al-Arab waterway. Then there was a massive underground system of syphonage, passing under the Euphrates and feeding "Saddam's River" a canal diverting water directly into the Gulf. And there was a third diversionary canal; the Mother of Battles River, designed to take water directly from the Euphrates to the Gulf, so it's hardly surprising that, collectively, these engineering works drained the marshes, thoroughly, of the water that was essential to sustain the complex ecosystems established there over millennia. In some places even the fertile topsoil was removed, deliberately, by bulldozers [23].



4 Post Saddam reflooding and reconstruction

So it seemed that an ancient way of life had gone forever; destroyed at the savage behest of Saddam Hussein. But even by 2003 when Alwash and Ochsenschlager were lamenting this tremendous destruction, the Marsh Arabs were taking matters into their own hands. They destroyed Saddam's dykes with bulldozers, dynamite and literally their own bare hands, blocked his canals and so the water came flooding back. Indeed, as Fletcher reports in 2008 [23] the Marsh Arabs acted quickly. So even by June 2006, Richardson and Hussein could report [24] that the flow of water into the marshes, from the Tigris and Euphrates, had been rather higher than expected, largely because of exceptional levels of melting snow in Turkey, not to mention northern Iraq, Iran and Syria.

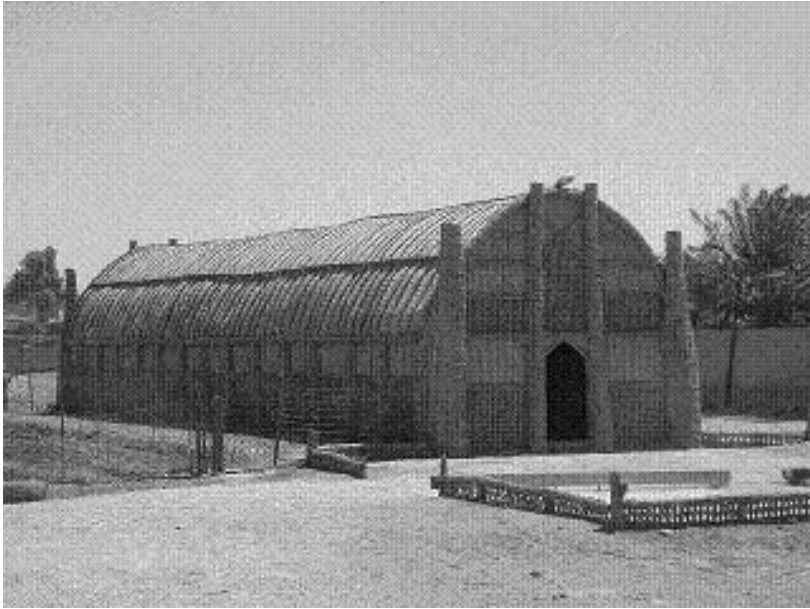
By September 2005, some 39 per cent of the original marshes had been re-flooded and, what's more, the quality of the incoming water was far higher than had been expected with much lower levels of salinity than had been anticipated. Earlier that year, indeed Lawler had reported [25] that by the previous April according to an Italian team, "Carp, trout, smaller fish, and nearly half of the 50 or 60 species of birds that once flourished in the marshes have returned." And two Iraqi teams, monitoring "water quality, phyto- and zooplankton, bottom sediments, fish and birds" although harassed occasionally by bandits were finding equally favourable results.

And by October 2007, Peter Reiss of DAI and USAID could report [26, 27] that over 50 percent of the original Marsh area had been re-flooded. Although no more than 2,000 of the Arabs were actually living their traditional lives on the floating islands. Others were making the best incomes they had ever enjoyed on firmer land by growing alfalfa, date palms, rice and other crops on the drier margins of the marshes. Nevertheless Reiss was able to illustrate a newly built *mudhif* (fig. 4) and who knows how many more will follow? Even by April 2003, USAID had raised some \$600 million for projects in Iraq – more, in equivalent terms – than it did for Germany after World War II – to improve public facilities, such as schools, medical centers etc; services including drinking water, energy and communications; not to mention developing sustainable economies based on fishery, agriculture and craftsmanship [28]. And by March 2008, the United Nations, collectively, had agreed that a further \$100 million be transferred from the \$1 billion already raised for their Iraq "Oil for Food" account for general developments in the country [29].

Reiss reports conditions in such a newly-built *mudhif* [30]. Whilst the external temperature might be more than 130 degrees Fahrenheit, internally it felt no more than 80 at ground level. No doubt the high roof allowed the warm air to rise. There was, internally, a "slight warm breeze". The smells were of charcoal, reeds and "warmth" whereas lighting levels at the end were "shaded" and there was "muted sunlight," through the reed-latticed windows.

In May 2003, the Italian Ministry for the Environment and Territory, various Iraqi Ministries, the Free Iraq Foundation and Nature Iraq set up the New Eden Project and by September 2006, they were able to produce their Executive Report including their Masterplan [31]. They also agreed some 100 million euros for new water supply systems and 20 million euros for pilot villages [32].





(a)



(b)

Figure 4: (a) Newly constructed *mudhif* exterior Photo Peter Reiss, 22 June 2003. (© DAI/USAID Iraq Marshlands Restoration Program.) (b) Newly constructed *mudhif* interior. Tribesmen arranged by status. (© Photo Peter Reiss, 22 June 2003. DAI/USAID Iraq Marshlands Restoration Program.)



The Executive Report [33] also includes preliminary designs for two types of settlement; the “Water Village” and the “Land Village.” These are intended to provide “modern” services to standards that the returning refugees would have experienced during their exiles, including health care and educational facilities, electricity and safe drinking water, not to mention commercial areas to be used by the community for trading and service purposes. Each settlement also is to provide opportunities for the realising the economic potential of the area by means of small fish ponds, reed handicrafts, the keeping of water buffalo and, around the Land Villages, small scale farming.

Age old, indigenous knowledge was applied in planning the actual structures in matters such as prevailing wind directions and the actual shape of the houses which was based on the cultural significance of the *mudhif* and other reed huts. Each of the houses is to have a service module, within a parallel service wing, including a bath-room and a kitchen, together with environmentally sensitive methods of sewage treatment and disposal. The actual siting of these villages of course was based on the historic location of settlements in the area, bearing in mind the potential extent of the restored marshes as the Iraqi government determines this.

Given electricity, of course, the Marsh Arabs can install fans, refrigerators, television, even the internet. In one new version, the *mudhif* is divided, lengthwise, into family-size units with a parallel service “wing” including not only domestic facilities but also open-sided courts for the water buffalo, farmyard animals, a kitchen garden and craft areas.

One thing is clear, our attempts at “greening,” designing with nature or whatever we care to call it seem rather puny compared with those of the returning Marsh Arabs with their absolute integration of environment, climate, resources and indeed their ancient life style. This, certainly, should give us pause for thought.

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