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Investigating and mapping Ancient Arabia

[DICTIONARY](#)[SCOPE](#)[USER
GUIDE](#)[EDITORIAL
STAFF](#)[AUTHORS](#)

[Home](#) / [Projects](#) / [Thematic Dictionary of Ancient Arabia](#) / [Table of contents](#) / [Ma'rib dam](#)

MA'RIB DAM

The iconic status of Ma'rib Dam in pre-Islamic Arabia owes much to its gigantic dimensions and the ingenuity of its builders, but even more to the fact that the Qur'an refers to its ultimate collapse.

Location and toponymy

The Ma'rib Dam is named after the town of Ma'rib, which lies 7 km downstream (**Fig. 1**), the ancient city of [Maryab](#), the capital of the kingdom of [Saba](#).

In [Sabaic](#) inscriptions, the [dam](#) is called *'rnm*, i.e., 'Arimān or 'the Dam', or *'rm Mrb*, i.e., 'Arim Marib or 'Marib Dam' ([Sadd Ma'rib 6](#)). *'rm* is a common name in modern Yemeni dialects (*'arm/'urm*, 'dike, dam'). However, in ancient times, it also seems to have been used as a proper noun.

The name is found in its Arabic form*, al-'arim*, in Sura 34 of the Qur'an, 'Saba'. There, the flood of al-'Arim and the desertification of the oasis are symbolic of divine punishment against [Sabaeans](#), deemed to be unbelievers. The breach of the Ma'rib Dam holds an important place in the etiological myths of Arab-Islamic Tradition. It is seen as the cause of the desertification of Yemen and the dispersion of Yemeni [tribes](#) throughout the Peninsula. Some pre-Islamic [poetry](#) alludes to the Ma'rib Dam, again named al-'Arim (see contribution by El Maşri in Darles et al. 2014).

Archaeological remains

The dam was a gigantic structure, damming one of Yemen's largest valleys, the Wādī Dhana, in a narrow defile as it emerges from the mountains, just before the wādī disappears in the Ramlat al-Sab'atayn desert basin. It consisted of a massive earthen levee completely barring the valley and two huge stone-built water inlets on the rocky bank at either end (**Figs 2-4**).

The earthen levee was 650 m long and reached 15 m in height in the bed of the wādī; at the base, its width was about 100 m. To prevent frequent breaches, it was protected by flat stones embedded in its surface. Today, only the northern third of the levee remains.

The earthen levee was flanked at both ends by two complex stone structures used as water intakes. These two structures are still standing today and show evidence of numerous repairs, extensions and additions. In its last state, the northern structure consisted of a spillway (massive threshold) to evacuate any overflow and two openings that supplied the canal irrigating the northern part of the oasis. The southern intake regulated the amount of water for the southern oasis of Ma'rib.

In ancient times, the waters of the Wādī Dhana were used to irrigate an area of nearly 10,000 ha in Ma'rib (Brunner 1983: 74, Schmidt 1987: 62). Today, the amount

TABLE OF CONTENTS

‘	A	B	C	D	E	F	G	H	
–	I	J	K	L	M	N	O	P	Q
R	S	T	U	V	W	X	Y	Z	

[SHOW ALL CONTENT](#)

Search



SECTIONS IN THIS ENTRY

- [Location and toponymy](#)
- [Archaeological remains](#)
- [History of research and discussion on the origins of the dam](#)
- [Construction stages according to epigraphic sources](#)
- [Components of the dam in the epigraphic record](#)
- [References and suggested reading](#)

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IMAGES / TABLES

of water that reaches Ma'rib each year is of the order of 1,000,000 m³.

History of research and discussion on the origins of the dam

Rediscovered in 1843 by the Frenchman T. Arnaud, the Ma'rib Dam was thoroughly studied in 1888 by the Austrian E. Glaser (Glaser 1897, Müller and Rhodokanakis 1913).

In 1980, a German archaeological team (dir. J. Schmidt, then B. Vogt) took up the study of the dam (Schmidt et al. 1982, 1986, Brunner 1983, Hehmeyer 1991, Schaloske 1995, Vogt 2003, 2004a, 2004b, Vogt et al. 2003). Over a period of almost 25 years, they amassed observations and surveys, and then proceeded to clear and restore the northern water intake.

Despite this work, the debate on the dating of the monument and its origin is still not closed.

The hydraulic engineer H. Radermacher distinguished three phases in the history of the dam. To date the beginning of phase 1, he used the height of the anthropogenic alluvial deposits (more than 33 m in some areas) and divided it by the average thickness of annual sedimentation, estimated to be about 1.1 cm (Brunner 1983). The resulting number, subtracted from c. 600 BCE (the approximate date of the last break in the dam), was 2400 BCE. This was therefore the date ascribed to the earliest dam for him. To date the last state of the dam, J. Schmidt relied on the inscriptions found there, which he sometimes wrongly assumed to be *in situ*. These bold assumptions implied that Ma'rib was the oldest known dam in the world, and that the remains still visible today date from a third phase, i.e., from the middle of the first millennium BCE.

This chronology was questioned by C.J. Robin (1988), who postulated that the last state of the Ma'rib Dam did not date from the end of the 6th cent. BCE, but rather from the 4th-6th cent. CE, based on the following arguments:

- The considerable dimensions of the dam and the violence of the Wādī Dhana floods required far greater technical mastery than that required to build the small Sabaean and Himyarite dams, all of which post-date the 2nd cent. BCE.
- The dam is not mentioned by classical authors. It is not even mentioned in the account of the [Roman](#) expedition led by [Aelius Gallus](#), that besieged Ma'rib around 25 BCE.
- The first epigraphic mention of the dam dates from 360-370 CE, when a king of [Himyar](#) undertook to repair the first documented breach.
- Finally, the most decisive evidence for the late date of the dam was that reused inscriptions dating back to the first three centuries CE can be seen at the base of various parts of the structure.

Furthermore, the height of the anthropogenic alluvial deposits was used to date the beginning of [irrigation](#), but there was no evidence to suggest that this irrigation was carried out by a structure completely blocking the valley. It seemed more likely that structures only diverted part of the flood, which was extraordinarily powerful in a narrow valley.

In the early 2000s, the discovery of new blocks at the northern intake by a German team also led B. Vogt to conclude that most of the intake elements were built after the first centuries CE (Vogt 2003, 2004a, 2004b, Vogt et al. 2003).

Today, it is acknowledged that most of the visible remains of the dam date from the 4th-6th cent. CE. This does not dismiss the fact that the dam had a long history before it took on its current appearance.

Construction stages according to epigraphic sources

The earliest hydraulic works currently recognised at the site of the dam began



under the leadership of the *mukarribs* of Saba', in the 7th-6th cent. BCE: Sumhu'alī Yanūf son of Dhamar'alī ([CIH 623](#)), and Yatha'amar Bayyīn son of Sumhu'alī Yanūf ([CIH 622](#) and possibly [RES 3943](#)). They mentioned the digging of a southern water intake in the rock on the edge of the Wādī Dhana. It is not clear from the available data whether this intake was impounded by a dam cutting off the entire stream or by a simple diversion wall partially on the bed of the wādī (Darles et al. 2014). There is currently no evidence for the existence of a dam at this high period.

The construction of the currently visible large dam took place after the middle of the 3rd century CE (Vogt 2003: 83, Vogt et al. 2003: 68). Several phases of repair following episodes of breaches are attested between the 4th and 6th centuries. They were the work of Himyarite rulers:

- the first attested breach took place in the course of the 4th cent. and repairs were undertaken under the authority of the Himyarite Kings Tha'rān Yuhan'im and his son Malkīkarib Yuha'min ([Ja 671+788](#));
- two more breaches were recorded in the years 454 and 455 and repaired under the leadership of King Shuriḥbi'il Ya'fur. The scale of the work is reflected in the quantity of supplies financed by the king during an entire year: 295,340 measures of cereals and dates, 1,363 heads of livestock, 1,000 camels, 670 camel loads of wine, 42 amphorae of honey and butter ([CIH 540](#); [Gar Sharahbil A](#));
- a new breach was sealed in the year 547, under the authority of King [Abrahā](#), and here again, the king provided 76,806 measures of cereals and dates, 10,200 head of large and small livestock, 300 camel loads of wine, 11,000 containers of date wine ([CIH 541](#), [DAI GDN 2002-20](#));
- at the end of Abrahā's reign, in 558, repair work on the dam was carried out under the authority of the leaders of the [Hamdān](#) tribe ([Ja 547+544+546+545](#));
- A final breach, which led to the abandonment of the hydraulic system, is probably related to the events mentioned in Sura 34 of the Qur'an.

Due to the accumulation of sediment upstream of the reservoir and in the irrigated areas, and frequent breaches, the maintenance of the dam became increasingly costly. At the end of the 6th cent. CE, the collapse of Himyarite power certainly explains the powerlessness of local populations to maintain such a monumental structure. All the more so since Ma'rib was no more than a secondary town by then as Ḥimyarite rulers had been more interested in the symbolic role of the city than in its then-marginal economic attraction. After that, the oasis seems to have been massively deserted.

Components of the dam in the epigraphic record

The inscriptions bear the names of several architectural structures, tentatively identified as follows (see C.J. Robin in Darles et al. 2014) (**Figs 1, 2, 4**).

- Abyan (*'byn*): Name of the northern part of the Ma'rib oasis, on the left bank of the Wādī Dhana, irrigated by the northern water intake (**Fig. 1**).
- 'Arimān/the Dam (*'rmⁿ*): The noun *'rm* (*'arim*) refers to the earthen levee between the two water intakes but also to the whole dam. It is a proper noun, 'Arimān/the Dam, or 'Arim Marib/the Marib Dam.
- 'Awdān (*'wdⁿ*): Common noun used as a proper noun, referring to the long wall flanking the great canal from the southern intake.
- Dhā'fān (*D'ⁿ*): Probable name of the diverter distributing water from the large Khabash^{um} canal between the secondary canals of the northern oasis.
- Ghaylān (*Ġyⁿ*): Name of the southern outlet in the northern water intake.
- Khabash^{um} (*Hbs^{2m}*): Name of the area through which the large canal runs from the northern water intake.
- Ḥabābiḍ (*Hbbḍ*): Name of the southern water intake cut into the rock between the stone pylon Qishbān^{um} and the Jabal Balaq al-Awsaṭ.
- Ma'qamān (*M'qmⁿ*): This could be the name of the northern water intake in the narrow sense, i.e., the two outlets and the piers that frame them.

- Madh'abān (*Md'bn*): Very hypothetically, this could be the long wall flanking the grand canal to the north at Khabash^{um}.
- Maflag^{um} (*Mflg^m*): Name of the northern outlet in the northern water intake.
- Qishbān^{um} (*Qs²bn^m*): Name of the pylon built by Abrahā upstream from 'Awdān.
- Raḥb^{um} (*Rḥb^m*): Name of the outlet cut into the rock, now the northern branch of the Y-shaped canal inside the southern water intake.
- Yasrān (*Ys¹rn*): Name of the southern part of the Ma'rib oasis, on the right bank of the Wādī Dhana, irrigated by the southern water intake (**Fig. 1**).

Christian J. Robin & Jérémie Schiettecatte

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Alternative spellings: Marib dam, Mareb dam, Maryab dam, Ma'rib dam, 'Arimān, 'Arimān, 'Arimān, Arimān, 'Arim, 'Arim, Arim, al-'Arim, al-'Arim, al-Arim, 'rnn, Sadd Ma'rib

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