

# The Indus Script

## A Mēl-Kōttālar Maritime Trade Ledger - Interpretive Readings and Decipherments

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## Abstract

For over a century, the Indus Valley script's brief, repetitive inscriptions have resisted decipherment. This study argues that the script serves as an administrative trade ledger rooted in Proto-Dravidian, developed by the Mēl-Kōṭṭālar maritime network. Pattern analysis of seals reveals consistent structure: origin → product/quality → quantity → route → destination, yielding repeatable readings as cargo tallies and consignments.

Etymological links tie Mesopotamian 'Meluhha' to Proto-Dravidian 'Mēl-Kōṭṭālar' ('high fort-builders'), supported by trade terms and reputation for massive mounds. The script's dual-layer design encodes practical logistics alongside concise rebus proclamations of authority and identity. These findings position the Indus civilization as a maritime trade powerhouse deeply connected to early Dravidian culture. Core interpretations are robust and repeatable, with provisional elements open to refinement. This framework strengthens the Dravidian hypothesis and redefines the script as a multifaceted tool for commerce and proclamation.

# Contents

## Pages

- Page 2: Abstract
- Page 4: Introduction
- Page 5: Methodology / Findings / Discussion
- Page 6: Animal Symbols
- Page 7: Key Signs
- Page 9: Signs List \*\*
- Page 14: Signs Translation
- Page 28: Example Seals \*\*\*
- Page 52: Conclusion / References
- Page 53: Notes

## Figures

- Figure 1: Title Page Illustration (Pipal tree with bulls and Indus symbols) – Page 1
- Figure 2: Map of the Indus Valley Civilization, c. 3300–1300 BCE (World History Encyclopedia) – Page 4
- Figure 3: Distribution of Seals by Site (table) – Page 6
- Figure 4: Seal type by time phase – Page 6
- Figure 5: A painted terracotta tablet from Mohenjo-daro (National Museum, New Delhi) depicts a large reed-built boat with a distinctive curved hull – Page 7
- Figures 6 a-b: Mohenjo-daro with(a) and without(b) sign 235 overlay – Page 8
- Figures 7-X: Selected Key Signs (as referenced in theory) – Pages 7 to 8
- Figures Y-Z: Complete Set of 417 Indus Signs (Mahadevan corpus, normalized forms) – Pages 9–12
- Figures Seals: Example Seal Impressions (dual-layer readings) – Pages 27–51

*\*\* Signs: The complete set of 417 distinct Indus signs from Iravatham Mahadevan's standard corpus (with additional interpretations), shown in normalised forms for quick visual reference. These provide the foundational map for numbered interpretations and Old Tamil/Proto-Dravidian readings.*

*\*\*\* Example Seals: 25 example seals from the Corpus of Indus Seals and Inscriptions (collections in India and Pakistan), demonstrating dual-layer translation. Analysis applied to the first twenty seals (M-1a through M-20a), excluding fragmentary inscriptions, a sequential non-selective dataset.*

# Introduction

For over a century, the Indus script's brief, repetitive inscriptions on seals and tablets have resisted decipherment, despite their standardization across a vast approximately 4500-year-old trade civilization spanning modern Pakistan, India, and beyond. This study argues that the script functioned as a dual-layer administrative tool developed by the Mēl-Kōṭṭālar maritime network: a practical logistics shorthand for recording cargo tallies, quantities, routes, and consignments, while simultaneously encoding concise rebus proclamations of authority and identity in Proto-Dravidian. The insight into the dual-layer nature emerged from pattern analysis of seals, where longer or public inscriptions (such as the Dholavira signboard) did not align perfectly with the standard ledger structure, prompting rebus readings that revealed concise proclamations of authority and identity alongside the practical logistics. This framework positions the Indus as a sophisticated maritime trade powerhouse deeply tied to early Dravidian culture and invites further collaborative refinement.

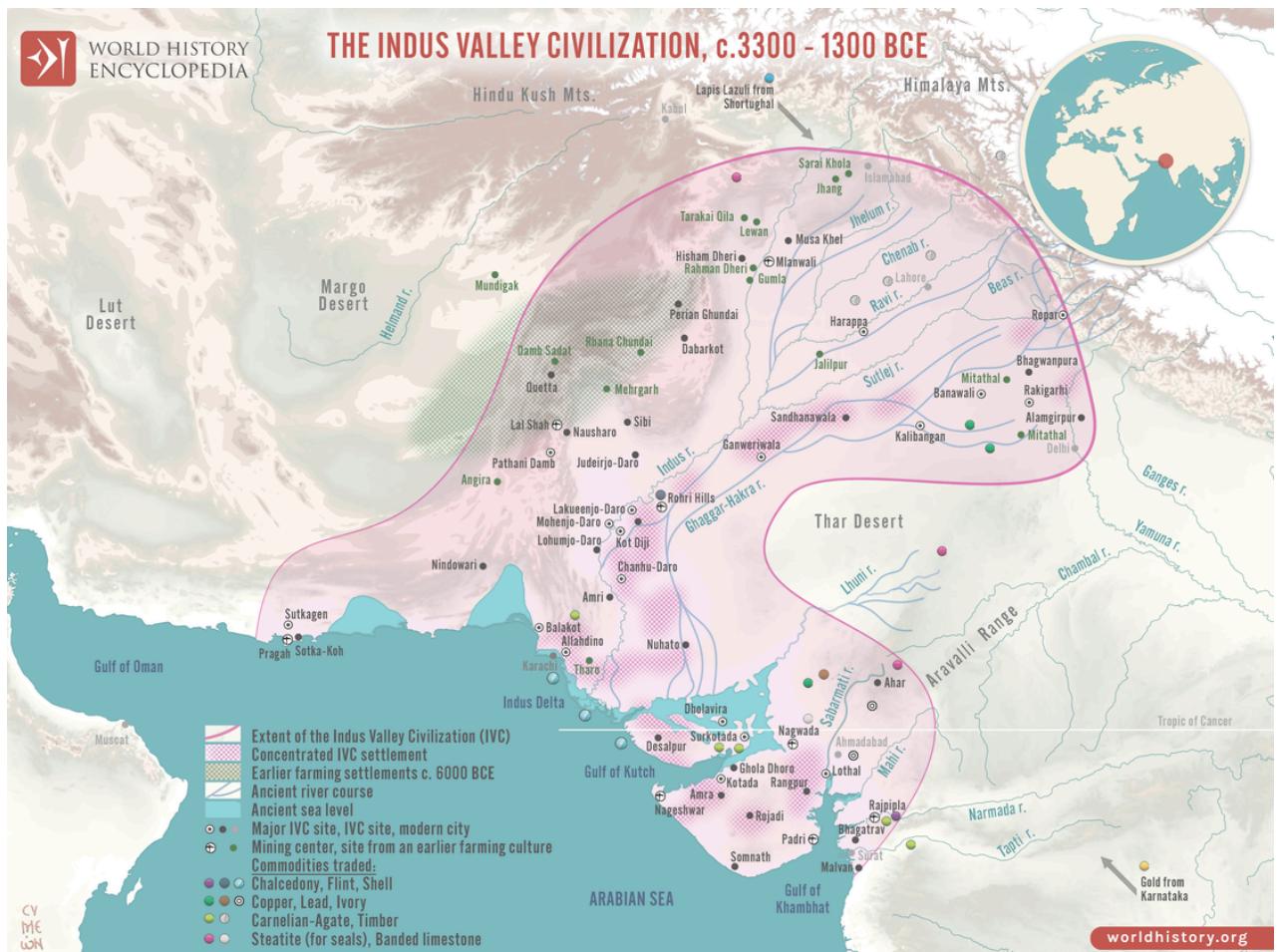


Figure 2: Map of the Indus Valley Civilization, c. 3300–1300 BCE (World History Encyclopedia)

## Methodology

This study uses a multi-method approach:

- Pattern analysis of over 400 seals and tablets from the standard Corpus of Indus Seals and Inscriptions (Mahadevan 1977 and later volumes), focusing on positional consistency across sites.
- Dual-layer decoding: Ledger layer via logographic/object interpretation (e.g., numerals from strokes/brackets, routes from building/waterway icons); rebus layer via acrophonic principle (first syllable of Proto-Dravidian name) + direct logographic for ideological terms.
- The Dholavira signboard served as a test case confirming the dual-layer structure.
- Etymological reconstruction linking Mesopotamian 'Meluhha' to Proto-Dravidian 'Mēl-Kōṭṭālar' using syllable matches and trade lexicon.
- Comparative cross-referencing with Proto-cuneiform numerals (~3500 BCE), Egyptian/Sumerian logo-syllabic mechanisms, and later South Indian continuity (e.g., Keezhadi).
- All readings prioritized repeatability and context (trade-related seals); ~50% sign values high-confidence from patterns, rest provisional (shape/logic-based).

## Findings

- Inscriptions on seals show a highly consistent sequence: origin/destination indicators framing product descriptors, quality markers, quantities, and route details (building/waterway icons), yielding repeatable readings as cargo tallies and consignments.
- The script operates on two layers: practical ledger (logographic trade records) and rebus (acrophonic Proto-Dravidian proclamations of authority/identity).
- Numeral system uses strokes for units and semicircular brackets (fluid orientation) for tens, with additive multiples, mirroring Proto-cuneiform.
- Etymological match: Mesopotamian 'Meluhha' corresponds to Proto-Dravidian 'Mēl-Kōṭṭālar' ('high fort-builders/exalted mound people').
- Animal motifs (e.g., dominant unicorn bull) function as guild/clan emblems.
- Rebus readings on tested seals consistently produce meaningful authority phrases tied to seal themes.
- Approximately 50% of the 417 signs have high-confidence meanings from patterns and cross-checks; remainder provisional.
- Parallels appear in later South Indian (e.g., Keezhadi sites), suggesting cultural continuity.

## Discussion

The consistent seal patterns strongly support the trade ledger interpretation: the regular origin-product-quantity-route-destination structure mirrors administrative practices in contemporaneous networks, especially Mesopotamian trade with 'Meluhha'.

The dual-layer design resolves the script's brevity paradox, each sign serves practical logistics (logographic) and hidden prestige (rebus acrophonic in Proto-Dravidian).

The etymological alignment of 'Meluhha' with 'Mēl-Kōṭṭālar' ('high fort-builders') fits the civilization's massive mounds and trade reputation. Shared numerals with Proto-cuneiform point to maritime exchange.

Animal icons (e.g., unicorn bull dominant) likely denote guilds/clans, with rebus yielding authority phrases tied to themes, deliberate prestige embedding.

Post-Sarasvati drying, parallels in South India (Keezhadi etc.) suggest continuity.

Core readings are repeatable; provisional ones open to collaboration. This strengthens the Dravidian hypothesis and reframes Indus as a maritime powerhouse with a complex script.

## Distribution of Animal Seals Across Indus Sites

Site	One-horn Bull	Zebu hump Bull	Short horn Bull	Elephant	Rhino	Tiger	Buffalo
Mohenjo-daro (M)	900	100	50	20	20	4	20
Harappa (H)	200	50	30	10	10	2	10
Lothal (L)	150	10	5	2	1	0	2
Kalibangan (K)	40	5	3	1	0	0	1
Chanhudaro (C)	50	5	3	1	1	0	1

*"Figure 3: Approximate estimates based on scholarly tallies from the Corpus of Indus Seals and Inscriptions (CISI Vols. 1-3) and reports (e.g., Parpola 2017; Kenoyer & Meadow 2010); exact counts vary due to fragments, tablets, ongoing discoveries, and re-evaluations. Mohenjo-daro dominates with over 1,000-1,500 seals (~60% of total known inscribed objects, ~4,000-5,000). Harappa a few hundred, Lothal ~150-200, smaller sites under 100 each."*

Data shows the one-horned bull motif dominating seals across all sites, with the highest numbers at Mohenjo-daro, Harappa, and Lothal. Rarer animals (zebu/humped bull, short-horned bull, elephant, rhino, tiger, buffalo) cluster heavily at the major urban centers Mohenjo-daro and Harappa, with very low numbers at smaller/peripheral sites. Numbers are approximate from CISI (Joshi & Parpola 1987; Parpola et al. 2010) and related studies (Parpola 2017; Kenoyer 2010). These icons likely served as emblems for the seal issuers – perhaps merchant guilds, clans, tribes, or regional authorities.

Rarer animals are far less common and appear primarily on seals from major urban centers like Mohenjo-daro and Harappa. One possible interpretation is that these motifs reflected the local megafauna of the issuer's region, symbolizing authority tied to familiar landscapes and resources. For instance:

- Rhinoceros and elephant: Evident in the wetter floodplains around the core Indus sites.
- Water buffalo: Suited to marshy lowlands.
- Tiger: Potentially linked to forested or southern areas, though depictions remain rare.

This thematic association could have reinforced identity in a trade network spanning diverse environments, without implying rigid geographic exclusivity. Plain seals (no animal) typically lack cargo references and may represent personal or administrative identifiers. *Figure 4 Time phases*

Phase	Dates (BCE)	Main Material	Notes/Counts	Motif Presence
Early Harappan	3300-2600	Steatite (early), terracotta	Few seals / animal + script combo	Mostly geometric /plain, rare animals
Mature Harappan	2600-1900	Glazed steatite (peak quality)	Thousands found; fancy, standardized	High animal motifs (bull dominant) + script
Late Harappan	1900-1300	more Terracotta less glaze	Lower numbers /quality	Fewer animals, more plain

## Key Signs in the Indus Trade Ledger

**The Human Figure (Stickman) – (āl)** The most frequent and recognisable sign is the simple stick-figure human. In Old Tamil, āl means "person", "man", "ruler", "guardian", or "worker" depending on context. This is a classic rebus: the picture of a man stands for the sound āl. All human-related titles in the script are built by adding modifiers (addresses, yokes, tools, weapons) to this base āl figure, turning it into job descriptions: porter, clerk, guard, weighmaster, etc. It's the foundation for every authority and occupation marker in the ledger.



**The Wheel (Cakkaram) – six-spoke circle** The emergence of the Indus Valley Civilization around 3500 BCE coincides precisely with the appearance of wheeled vehicle technology. Evidence from sites such as Harappa includes terracotta model carts and wheels dated to this period, marking one of the earliest known instances of this innovation. In the fertile alluvial plains, the wheel enabled efficient transport of goods over long distances, supporting the rapid growth of urban centers like Harappa and Mohenjo-daro.



With the wheel came ox-drawn carts capable of carrying substantial loads; cotton, grain, beads, and metals, facilitating extensive trade networks between independent town settlements. The individuals or groups who controlled these wheeled transports gained significant economic influence, connecting otherwise autonomous communities through commerce. The cakkaram, the distinctive six-spoke wheel sign frequently appearing on seals, likely served as the identifier of these wheeled traders or transport guilds. Its high frequency and prominent placement on inscriptions indicate a mark of authority associated with mobility and trade. Rather than representing abstract cosmic or religious concepts, the symbol reflects technology that sustained the civilization's interconnected economy. As trade linked the towns, it became a shared emblem of the wheeled traders whose innovation drove prosperity and cultural exchange across the region.

**The Boat sign (representing canal/river/harbour dock - vāy)** The overwhelming frequency of this sign known as the jar, appearing over 650 times and most often in terminal position combined with Mohenjo-daro yielding roughly 60% of all known seals, strongly suggests this glyph marks the primary destination in the trade ledger. This study proposes this sign represents the central warehouse or port facility of the Kotṭālar guild, located at their main urban hub: the massive brick-mound city modern scholars call Mohenjo-daro ("Mound of the Dead"). Most consignments end with this sign because the majority of recorded shipments were bound for the guild's headquarters, the economic and administrative heart of the network, where goods were received, tallied, and redistributed. The U-shape represents the reed boats which were the civilization's primary mode of transporting goods along canals, rivers and across the sea. This study suggests this sign represents Mohenjo-daro canal dock which is now dry land and the real name may have been Kotṭālar (Buildings/forts) kōt-(fort) alar-(plural=forts)), land of buildings.



Figure 5: A painted terracotta tablet from Mohenjo-daro (National Museum, New Delhi) depicts a large reed-built boat with a distinctive curved hull

### The Mohenjo-Daro Inner City sign

This sign could be cultural symbolism or a location marker due to the modifier type it has on sign 235 which is a river/canal addition. So considering it as a possible location, the search for three triangles in the IVC area began, an obvious match seemed to be the 3 segments of the city. It does not match the sign perfectly from satellite view, but does symbolize the city layout quite well.

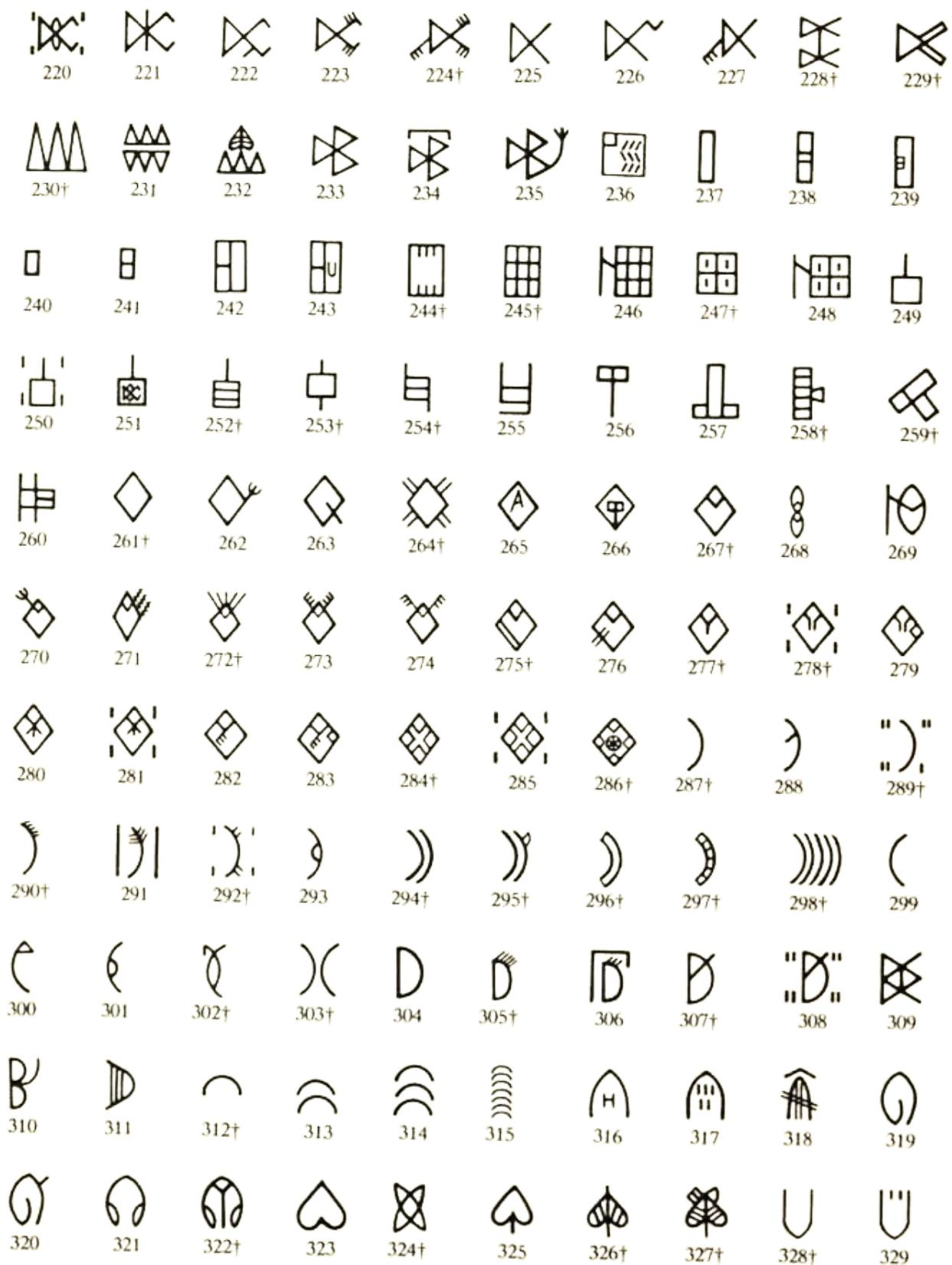


figures 6 a & b - Mohenjo Daro with (a) and without (b) sign 235 overlay

## The Indus Valley Signs List

1†	2†	3	4	5	6	7	8†	9†	10
11	12†	13	14†	15†	16	17†	18	19†	20
21	22	23	24	25	26	27	28†	29†	30
31	32†	33	34	35†	36	37	38†	39	40†
41	42	43	44	45	46	47	48†	49†	50†
51†	52	53†	54†	55†	56†	57†	58	59†	60†
61	62	63	64	65	66	67†	68†	69†	70†
71	72†	73†	74†	75	76†	77	78†	79	80
81†	82	83	84†	85	86†	87†	88	89†	90†
91†	92	93	94†	95	96†	97	98†	99	100
101	102†	103†	104†	105	106†	107†	108	109†	110

111†	112†	113	114	115	116	117	118	119†	120†
121†	122	123†	124†	125†	126	127†	128†	129	130†
131	132†	133	134	135	136†	137†	138	139	140
141†	142†	143†	144	145	146†	147	148	149†	150†
151	152	153	154	155†	156	157	158†	159†	160
161	162†	163	164	165	166	167†	168	169†	170
171†	172	173†	174	175†	176†	177†	178†	179	180†
181†	182†	183	184†	185	186†	187	188	189	190†
191	192	193†	194†	195	196	197†	198†	199	200
201†	202†	203	204†	205†	206†	207	208	209	210†
211	212	213†	214†	215	216†	217†	218	219†	



									
330†	331†	332†	333	334†	335	336†	337†	338†	339
									
340†	341†	342†	343†	344	345†	346	347†	348†	349
									
350	351	352	353	354	355	356	357	358†	359†
									
360	361	362	363	364	365†	366	367†	368	369
									
370	371†	372	373†	374†	375†	376	377	378	379†
									
380	381†	382	383	384†	385	386	387†	388	389†
									
390	391†	392	393†	394†	395†	396	397	398	399
									
400†	401	402†	403†	404	405	406	407	408	409
									
410	411	412	413	414	415	416	417†		

# The Mel-kottālar Maritime Ledger

## Interpretation of the Indus script

### (Based on Mahadevan's Concordance (CIS 1977))

This is not a spoken language. It is a 4500-year-old global trade network's logistics shorthand: cargo tallies, titles, port maps, sealed containers, and warehouses stamped on clay by the people of the Indus valley. Every sign is read exactly as it appears on the seal.

Custom signs (warehouse plans, delta maps, dock layouts) are read descriptively as one-off logos.

- 1: āl - stickman - man / person
- 2: āl-mēr - stickman flanked by straight vertical lines - gateway deputy / customs clerk.
- 3: āl-kīl - stickman with stake - foundation clerk / low-rank riser
- 4: āl-kōtī - stickman with flag on head - frontier scout / explorer / new-port pioneer
- 5: āl-vālī - stickman with dual-horned headdress - horned authority guard / high-rank plains figure
- 6: āl-kōmētū stickman with downward-curving horn headdress (kō = horn/bull, mētū = plains/highland plateau) - core northern plains authority marker (predominant in northern sites).
- 7: āl-kōmēl - stickman with upward-curving horn headdress on stand (kō = horn/bull, mēl = high/elevated/harbor) - elevated harbor authority / southern proxy marker (predominant in harbor sites).
- 8: āl-tōl-mērī - stickman with twin shoulder lines - armed guard / dual-weapon carrier.
- 9: āl-mēr - stickman with twin shoulder lines flanked by straight vertical lines (squeezed variant) - gateway armed guard (gateway position, with dual-weapon carrier).
- 10: āl-koṭu - stickman with measuring rod - weighmaster.
- 11: āl-tōl - stickman yoke-bearer - caravan porter.
- 12: āl-tōl-mērī - yoke-bearing stickman with two ovals - cargo porter (dual-load carrier).
- 13: āl-kīl-tōl-mērī - low yoke-bearing stickman - junior porter.
- 14: āl-kīl-tōl-mērī-kōtī - yoke porter with pointy hat - outpost porter / local representative.
- 15: āl-kīl-tōl-mērī-kōt-vāy yoke porter with notched jug-hat - Kōt-vāy office porter (gateway fort dock, Kōt vāy/Mohenjo-Daro site).
- 16: āl-kīl-tōl-mērī-vālai - twin yoke porters with net - net-haul / fishermen.
- 17: āl-vāl - stickman with sword - guard / armed person.
- 18: āl-kai-mēl - stickman with raised right hand - oath-giver / command salute.
- 19: āl-vēl - stickman with five-prong comb - five-canal port authority.
- 20: āl-kīl-vēl - stickman with five-prong comb and base mark - junior five-canal port clerk.
- 21: āl-vēl - stickman with three-prong trident - three-river guardian.
- 22: āl-vēl-mēl - stickman with inward-turned three-prong trident - returning delta authority.
- 23: āl-vēl-kīl - stickman with piercing three-prong comb - foundation delta canal guardian.
- 24: āl-vēl-kīl-iru - stickman with twin opposing three-prong combs - dual-direction three-canal checkpoint.
- 25: āl-cūlam - stickman spear-bearer - warrior guard.
- 26: āl-cūlam-mēr-kīl - spear-bearer between pillars with corner dashes - four-quarters gateway guard.
- 27: āl-vālī - stickman bowman - archer guard.
- 28: āl-vālī-mērī - stickman with loaded bow - ready archer.
- 29: āl-vālī-iru - stickman with twin loaded bows - double archer.
- 30: āl-maṇi - stickman holding diamond pouch - sealed cargo pouch bearer / courier.
- 31: āl-mērī-mīn - stickman holding oval-with-inner-oval - premium sealed cargo pouch bearer / courier.
- 32: āl-kūṭal - stickman with U-cup - cup-bearer / offering bowl measurer.
- 33: āl-kūṭal-mērī - stickman with cup and bag - double-offering measurer.

34: āl-kūṭal-mēri - stickman with U-cup and single unit line - grain measurer / 1-unit dry-goods clerk.

35: āl-kūṭal-taṇṇīr - stickman with liquid-filled cup - liquid measurer.

36: āl-vāha - stickman with load symbol - cargo porter / load measurer / 1-cart/boat/sled load clerk

37: āl-paṭṭu - stickman with hanging cloth - textile bearer.

38: āl-kāṭu - stickman with four-strand belt - female figure (dancer / belled waistband).

39: āl-mūlam - stickman with downward extra arm - fertility marker.

40: āl-kaṭṭu - stickman with rectangle on leg - stone/block carrier (mason or builder).

41: āl-ōṭam - stickman foot traveler - walking caravan porter.

42: āl-cakram - stickman wheeled traveler - cart caravan porter.

43: āl-teppam - stickman boat traveler - boat porter.

44: āl-ōṭam-kūṭal - running stickman with U-container - swift messenger with sealed bowl.

45: āl-uṭkār-kūṭal - sitting stickman with U-cup - seated cup-bearer.

46: āl-uṭkār-kūṭal-vēl - sitting stickman with U-cup and three-prong trident - seated offering bearer at three-canal location.

47: āl-tūki - sleeping stickman with oval head-rest - night-watch / upright sleeper.

48: āl-tūki-nālu - sleeping stickman with four rays - night-watch with bedding marker.

49: tīrai (variant) - bovine hind leg (crude or reversed engraving) - prime hindquarter meat cargo.

50: nāy - dog glyph - frontier patrol marker / western hound crew.

51: kōli-kaṭṭu - hanging/trussed bird glyph - single-unit hanging or bundled chicken/poultry cargo (processed for trade/transport).

52: kōli-kaṭṭu-mēr - premium hanging/trussed bird glyph - single-unit high-grade hanging chicken/poultry cargo.

53: nandu-veṭṭu - pincer with oval body - processed crab cargo (de-legged/cleaned).

54: nandu - crab glyph - standard shore-caught crab cargo.

55: nandu-kīl - crab with inner spot - spotted/variant crab cargo (different species or grade).

56: teṇkāy-iru - twin facing coconuts - paired coconut cargo (exotic southern high-value pack).

57: pūcci-iru - twin-bodied insect - paired insect cargo (double locust/beetle pack).

58: āmai - turtle glyph - live turtle cargo (or foundation marker if bottom-positioned).

59: mīn - fish glyph - standard fish cargo.

60: mīn-nālu - fish with four surrounding dashes - four-quarters certified fish cargo.

61: mīn-kōṭai - fish with tall open-bottom building (square roof) - warehouse-stored fish cargo.

62: mīn-kōṭi - fish inside sealed brackets with flagged right bracket - sealed fish cargo for frontier/outpost delivery.

63: kōli-mīn-kōṭi - chicken + fish inside sealed brackets (chicken first) - mixed poultry & fish bundle (chicken primary).

64: mīn-kōli-kōṭi - fish + chicken inside sealed brackets (fish first) - mixed poultry & fish bundle (fish primary).

65: mīn-mēl - fish under pointy roof - temple-grade / processed fish cargo.

66: mīn-mēl-nālu - fish under pointy roof with four corner dashes - temple-grade fish certified for four quarters.

67: mīn-kaṭal - walking catfish glyph - walking catfish cargo.

68: mīn-kaṭal-nālu - walking catfish with four corner dashes - four-quarters certified walking catfish (top-grade).

69: mīn-kaṭal-vāl - walking catfish with long whiskers - premium-grade walking catfish.

70: mīn-onṛu - fish with single inner vertical line - one unit dried/salted fish cargo.

71: mīn-onṛu-nālu - fish with inner vertical line and four corner dashes - one unit dried/salted fish certified for four quarters.

72: mīn-veṭṭu - fish with diagonal slash - processed/cut fish cargo.

73: mīn-veṭṭu-nālu - slashed fish with four corner dashes - processed fish certified for four quarters.

74: mīn-vāl - fish with extra tail fins - hilsa / canal-run river herring cargo.

75: mīn-uvar - textured fish under pointy roof - salted & dried fish, temple/warehouse grade.

76: nīr-kkōlī - long-necked textured bird - live Great Indian Bustard cargo.

77: vāl-iru - bird with double tail feathers - swallow-tailed kite / fork-tailed delta bird.

78: kōlī-uyir - feathered standing chicken - live poultry cargo.

79: katā - quail glyph - live quail cargo.

80: kōlī-paravai - flying chicken / jungle fowl glyph - red junglefowl cargo.

81: kōlī-Koodai - traditional chicken coop or basket used to house or transport poultry.

82: paravai-muttai - bird in oval egg - live bird + eggs combo pack.

83: kōtī-mēl - headless bird - processed Great Indian Bustard cargo.

84: tīrai - single bovine leg - prime hindquarter meat cargo (beef).

85: tīrai-vēṭṭu - slashed bovine leg - butchered/portion-cut bull meat.

86: on̄ru - single vertical line - 1 unit tally (one sealed pack/measure).

87: iru - two vertical lines - 2 units tally.

88: iru-nālu - two vertical lines with four corner dashes - 2 units certified for four quarters.

89: mūṇru - three vertical lines - 3 units tally.

90: mūṇru-vēl - three vertical lines with rising three-prong trident (mid-right) - 3 units allocated to three-canal delta.

91: mūṇru-vēl-mēl - three vertical lines with left-up rising three-prong - 3 units for three-canal delta (haul).

92: mūṇru-kōtī - three vertical lines under pointy roof - 3 units tent hut marker

93: mūṇru-kōtī - three vertical lines (rightmost leaning out) - 3 units flagged for frontier/new-zone.

94: mūṇru-kōtī - three vertical lines (two rightmost leaning out) - 3 units flagged for frontier/new-zone (variant).

95: nālu - four vertical lines - 4 units tally.

96: aintu - five vertical lines - 5 units tally.

97: on̄ru - single upper dash (with tick) - 1 unit tally (variant form).

98: on̄ru - 1 unit tally (variant form/standard product modifier)

99: mēl-iru - two upper dashes - gateway marker (departure or destination modifier).

100: iru - two mid-level dashes - 2 units tally.

101: iru - two stacked dashes - 2 units tally (space-saving variant).

102: mūṇru - three mid-level dashes - 3 units tally.

103: mūṇru - three staggered dashes - 3 units tally (space-saving variant).

104: nālu - four mid-level dashes - 4 units tally.

105: nālu - four dashes in 2×2 grid - 4 units tally (compact variant).

106: aintu - five mid-level dashes - 5 units tally.

107: aintu - three upper + two lower dashes - 5 units tally (variant form).

108: āru - six mid-level dashes - 6 units tally.

109: āru - three upper + three lower dashes - 6 units tally (variant form).

110: ēlu - seven dashes - 7 units tally.

111: ēlu-irupatu - seven dashes inside brackets - 27 units tally.

112: ēlu - shifted seven dashes - 7 units tally (variant).

113: ēlu-irupatu - shifted seven dashes inside brackets - 27 units tally.

114: eṭṭu - eight dashes - 8 units tally.

115: on̄patu - nine dashes - 9 units tally.

116: on̄patu - shifted nine dashes (five upper + four lower) - 9 units tally

117: on̄patu-mēl - shifted nine dashes under roof - 9 units warehouse tally.

118: pattu - ten dashes - 10 units tally.

119: muṇai-mūṇru - zig-zag triple wave - grass / fodder cargo.

120: muṇai-mūṇru - balanced zig-zag triple wave - grass / fodder cargo.

121: paṇṇ iran̄tu - twelve vertical lines - 12 units tally.

122: paṇṇ iran̄tu-irupatu - twelve lines inside sealed brackets - 32 units tally.

123: mēl-pirivu Slanted vertical line with upper dash - high-status marker (post-departure modifier).

124: mēl-pirivu Upside-down Y with detached arm - high-status marker (variant form, post-departure modifier).

125: mēl-pirivu Upside-down Y with extra arm - high-status marker (variant form, post-departure modifier).

126: mēl-tūy - vertical upside-down Y - river location marker.

127: kōti - plain flag-pole - frontier outpost marker.

128: kōti-vār - flag-pole with dangling tether - outpost on hold / bonded cargo marker.

129: vāy-kīl - inverted tick (downward V) - single river bend marker.

130: vāy-mēṇḍu - paired ticks forming S-bend - meandering river section marker.

131: vāy-kīl-kūṭtai - zig-zag under flat roof - covered drain/channel.

132: nīr-vāy - W-shape with left vertical join - waterway marker.

133: nīr-vāy-mēl - double-stacked W with left vertical - major waterway access.

134: kuṭi - upside-down V - tent/hut/non-stone shelter.

135: kūṭil - upside-down V with solid rectangle legs - tent/hut/non-stone shelter.

136: kūṭil - thick crossed bars with three lines each side - tent/hut/non-stone shelter.

137: kiram - plain crossed lines - crossroads marker (trade route junction location).

138: kiram-mēl - crossed lines under pointy roof - high-status crossroads marker.

139: kiram-kōṭtai - crossed lines under flat roof - fortified crossroads marker.

140: kiram-nālu-mēr - crossed lines with eight flanking dashes - crossroads with eight routes marker.

141: kiram-cūlam - crossed lines between twin pillars - gateway crossroads marker.

142: kiram-cūlam-kōṭtai - crossed lines with pillars under flat roof - fortified gateway crossroads marker.

143: kiram-cūlam-nālu - crossed lines with pillars with eight strokes - balanced crossroads with gateway marker.

144: kiram-cūlam-kōti - crossed lines with pillars in arcs - flagged crossroads with gateway marker.

145: kiram-cūlam-kātu - crossed lines with pillars with waist-band - four-quarters crossroads with gateway marker.

146: kiram-mīṇ - crossed lines with fish on arms - fish crossroads marker (junction for fish trade).

147: kiram-mīṇ-mēr - crossed lines with central fish - high-status fish crossroads marker.

148: cakkaram-nālu - hooked cross (swastika form) - four-quarters prosperity marker.

149: Māvalai - thick crossed lines with open ends - Māvalai/Kalibangan city, inland waterway & trade network.

150: Māvalai - thick crossed lines with closed ends - Māvalai/Kalibangan city, inland waterway & trade network.

151: Māvalai-malai-valī - thick closed crossroads with three-peak highland mark - Māvalai/Kalibangan with highland modifier marker.

152: Māvalai-mūṭtu-mūṇṛu-vāykal - thick closed crossroads with extending three-prong trident bottom right and up - Māvalai/Kalibangan with three-canal modifier marker.

153: mātrā - single vertical line under open pointy roof - 1 unit measure marker

154: vāli - long pole/staff/long stick (like a walking staff or banner pole). Also long-lived/prosper.

155: vāy-kōti - vertical line with two sloping arms - grapevine cross / vineyard cargo marker.

156: vāy-kōti-kūṭtu - grapevine cross inside inward-curved brackets - sealed vineyard cargo marker.

157: vāy-kōti-mēr - grapevine cross with extra left arm - premium vineyard cargo marker.

158: vāy-kiram - vertical line with crossed lines on top - crossroads post marker.

159: kuṭi-kiram - vertical line with crossed lines on top under pointy roof - tent hut crossroads post marker

160: vāy-kiram-valai - vertical line with crossed lines on top + net hanging from left arm - crossroads post with net-fishing marker.

161: vāy-pirivu - plain Y-shape - two-way river split marker.

162: vēl-kīl - three-prong trident with curved tines - wooden stirrer for brick pits.

163: vēl-kīl-mēl - three-prong trident under pointy roof - high-status brick pit stirrer / elevated stirrer tool marker.

164: vēl-kīl-nālu-mēr - three-prong trident with eight dashes - three-canal crossroads with eight routes marker.

165: vēl-mēr-aiñcu - trident under detached five-branch bar - three-river five-canal bridge marker.

166: vēl-kīl-tāl - three-prong trident with five-dash bar downward - three-canal downstream river marker.

167: vēl-kīl-iru - trident with extra side prongs - five-canal river marker.

168: nīr-kōtu - pine-tree shape (central trunk + upward branches) - main drainage/canal tree map.

169: kōtu-kīl-nālu-nīr - vertical line slanting right + four left-leaning dashes - four-stage falling tributary marker.

170: kōti-nālu - post with right square lagoon and four east outlets - square reservoir with four-canal marker.

171: nālu-vēl - vertical line with four-prong comb upward - four-canal authority marker.

172: vāy-kāy-iru - two opposing horizontal bars with five inward dashes each - twin five-canal river marker.

173: vāy-kāy-mēr - five-canal post with extra attached bar (nine total) - nine-canal major river marker.

174: vāy-nālu-mēr - two vertical lines crossed near top with two side dashes - four-canal river marker.

175: vēl-kāy - horizontal lock bar + oval basin below + three-prong inflows above - three-canal tidal dock marker.

176: vāy-kāy-pakkam - vertical post with five right-side horizontal dashes - five-side-canal river marker.

177: vāy-nālu-kuru - vertical post crossed by four horizontal lines along shaft - location of four-canals crossing river.

178: paṭtu - A-frame draped cloth / folded textile cargo marker (high-value linen/fabric pack).

179: paṭtu-mūñru-kūṭtu - A-frame draped cloth with seven-line confluence / premium folded textile cargo marker (sealed or multi-unit fabric pack).

180: vāy-mūñru-kūṭtu - four left-leaning lines merging into three right-leaning, top horizontal - seven-line confluence river marker.

181: vāy-mūñru-iṭukki - seven-line confluence with top-right pincer - seven-line confluence with metalworker marker.

182: cūlam-kūṭtai-mēl - roof rectangle on twin pillars + sealed side wings - roofed gateway warehouse marker.

183: kūṭtai-kīl-tūy - sealed wings with double floors + foundation posts + left latch - locked warehouse marker.

184: kūṭtai-vāy-vēl-mā - twin pillars with gatehouse + grapevine right + three-bar comb left - warehouse with grapevine bay and three-canal inlet marker.

185: kūṭtai-mēr-mūñru - flanked rectangle on three posts with braces - elevated three-post building marker.

186: kūṭtai-mūñru - two verticals with three mid horizontals - three-tier warehouse marker.

187: kūṭtai-mūñru-vāy-mēr - three-tier warehouse with right upward arrow - three-tier warehouse with outflow ramp marker.

188: kūṭtai-mēl-tūy - flat-roof rectangle with tall side wings - high-walled warehouse marker.

189: paṭtu-kālam - horizontal base with four vertical posts - four-post textile loom marker.

190: paṭtu-kālam - horizontal base with four upright posts topped with V guides + three lower horizontals - four-post textile loom marker.

191: kūṭtai-vāl-mēr - vertical line with bottom/mid horizontals + two inner dashes + right horn post - guarded warehouse marker.

192: kūṭtai-mūñru-mēr - rectangular base with twin gable triangles - twin-peak warehouse marker.

193: kūṭtai-mūñru-mēr-iru - twin gable warehouse with two inner pillars - premium twin-gable warehouse marker.

194: küt̄tai-kıl-mēr - open-bottom rectangle with thick walls + top-left bastion - fortified warehouse marker.

195: küt̄tai-vây - open-bottom square with grapevine cross rising into it - warehouse at vineyard marker.

196: küt̄tai-vây-mēl - arched roof over open-bottom square with grapevine cross rising into it - roofed warehouse at vineyard marker.

197: küt̄tai-mēr-kıl - large warehouse with central top square - warehouse with central tower marker.

198: küt̄tai-mēr-mūñru - large warehouse with central tower + three-bay top - warehouse with triple-bay tower marker.

199: küt̄tai-mūñru-vēl - large warehouse with three-prong on top - three-river delta warehouse marker.

200: küt̄tai-nālu-vēl - open-bottom square with four-prong comb on top - four-canal warehouse marker.

201: küt̄tai-vây - square building with open bottom doorway - warehouse with entrance marker.

202: küt̄tai - rectangle on two vertical lines - building marker.

203: küt̄tai-mēl - flat roof over rectangle on two vertical lines - flat-roofed building marker.

204: paṭtu - triangle with three horizontals - textile.

205: paṭtu-mēr - curved triangle with horizontals - textile.

206: kālam-tōñki - triangle with T-bar hook - hanging textile loom marker.

207: kālam-tōñki-nālu - triangle with T-bar hook and four corner dashes - hanging textile loom with four-quarters marker.

208: kālam-tōñki-küt̄u - triangle with T-bar hook and flat roof over - roofed hanging textile loom marker.

209: kālam-kıl - plain triangle with central vertical line - open textile loom bay marker with central post.

210: kālam-mūñru-mēr-kıl - stepped triangle with three horizontal lines and central vertical line - tiered textile loom with central post marker

211: tī-kāmbu - solid triangle on vertical post - fire stick / beacon post / elevated signal marker.

212: tī-vēli (or tī-pīñham) - upside-down triangle top with upward-angled arms on vertical post - fire altar on stand / hearth beacon marker.

213: kālam-mēr-kıl - vertical post with upside-down triangle top + upward-angled arms - fire altar on stand / hearth beacon marker.

214: müt̄tu-kattu - X with solid sides - sealed bound cargo bundle (fully tied and locked pack).

215: müt̄tu-kattu-iru - X with solid sides + extra full right half attached - double sealed bundle (two packs tied as one consignment or double-thickness sealing on right).

216: korado - single open pincer (standalone arms pivoted) - drag sled "1 load" symbol.

217: korado-iru - two open pincers facing each other (open ends inward) - paired drag sleds "2 loads" symbol.

218: korado-küt̄u-iru - two open pincers facing each other with U-cup between them - paired drag sleds gripping sealed bowl load.

219: korado-müt̄tu - open pincer arms on solid-sided X with half-oval caps above and below center - sealed drag sled load bundle.

220: korado-müt̄tu-kātu - open pincer arms on solid-sided X with half-oval caps above and below center + four vertical dashes at corners - sealed drag sled load bundle, bonded/four-quarters certified.

221: korado-müt̄tu-on̄ru - open pincer arms on solid-sided X with single central vertical line - sealed drag sled "1 load" pack.

222: korado-mēr-tāl - open pincer arms on solid-sided X with downward-leaning horizontal dash on mid lower right arm - lowered/seated drag sled load bundle.

223: korado-mūñru-kıl - open pincer arms on solid-sided X with three left-leaning vertical dashes attached to right-side arms - drag sled load with triple attachment/modifier.

224: mūṭṭu-mūṇṛu-tāl - solid-sided X on left vertical with three left-leaning dashes on right arms downward horizontal dash left with three-prong fork pointing down - lowered three-division crossed post (foundation gate with triple divisions and descending triple fork)

225: korado (variant) - same as 216, asymmetric/lazy drawn (left post only) - outpost quick-load drag sled variant

226: korado (variant) - asymmetric pincer with extra upper dash - outpost drag sled load with extension

227: korado-tāl-vēl - asymmetric pincer with downward three-prong fork - drag sled load at three-canal downstream location

228: korado-iru-kīl - double stacked asymmetric pincers joined central - paired low-grade drag sled loads / twin foundation load set

229: korado-mēr-kāṭu - thick asymmetric pincer on left post, right arms reinforced - reinforced drag sled load / heavy-duty four-quarters load tool

230: mūṇṛu-kōṭu - three peaks - three-ridge mountain location marker (western Kohistan hills, Gaj-Tharo-Buri cluster).

231: mūṇṛu-kōṭu-mēr-mūṇṛu - three peaks above three mirrored peaks - double three-ridge mountain marker (elevated western Kohistan hills, premium highland source).

232: mūṇṛu-kōṭu-palam - three peaks with palm tree above - three-ridge outpost with palm grove marker.

233: kōṭu-mūṇṛu-mēr - three tilted triangles sharing common side, two upper pointing right, one lower - Kōṭ-vāy inner city triple mound/basin map marker (gateway fort inner layout).

234: kūṭṭai-kōṭu-mūṇṛu-mēr - three tilted triangles sharing common side, two upper pointing right, one lower, under square-bracket roof - Kōṭ-vāy inner city roofed warehouse with triple mound/basin marker.

235: vēl-kōṭu-mūṇṛu-mēr - three tilted triangles sharing common side, two upper pointing right, lower right peak with curved line rising upward ending in three-prong fork - Kōṭ-vāy inner city basin with eastern triple-canal outflow marker.

236: kāṭu-kāṭu - square with small square top-left, three wavy lines mid-right - fenced enclosure with grass marker.

237: kāṭu-mēr - tall upright rectangle - tall town post marker.

238: kāṭu-mēr-iru - tall upright rectangle with two horizontal lines inside at mid-height - double-level tall town post marker.

239: kāṭu-mūṇṛu-vēl-kīl - tall upright rectangle with three-pronged fork at mid-height facing left - tall town post with western triple-canal division marker.

240: kōṭṭai-onṛu - small upright rectangle at mid-height - single-unit building marker.

241: kōṭṭai-iru - small upright rectangle at mid-height repeated or doubled - two-unit building marker.

242: kōṭṭai-mūṇṛu - upright rectangle divided into three rooms - three-bay warehouse marker.

243: kōṭṭai-mūṇṛu-kūṭal - upright rectangle divided into three rooms, one containing U-cup - three-bay warehouse with sealed bay marker.

244: kōṭṭai-ēṭṭu - rectangle divided into four upper bays and four lower bays - eight-bay warehouse marker.

245: kālam-pattu-ombatu - grid of nine squares - salt farm.

246: kālam-pattu-ombatu-mēr - grid of nine squares with spear modifier - protected salt farm.

247: kālam-nālu - four squares arranged in a square, each with single vertical dash in center - salt farm.

248: kālam-nālu-mēr - four squares arranged in a square, each with single vertical dash in center, with spear modifier - protected salt farm.

249: kōṭṭai-mēr-kīl-onṛu - square with vertical line rising from mid-top - single-unit warehouse with central post marker.

250: kōṭṭai-kīl-mēr-kāṭu - square with vertical line rising from mid-top + vertical dash at each corner - four-quarters location post marker.

251: kōṭṭai-kīl-mēr-korado - square with vertical line rising from mid-top, sealed drag sled load bundle (219) inside - location post with load marker.

252: kōṭṭai-kīl-mēr-iru - square with vertical line rising from mid-top, two horizontal lines inside the square - double-level location post marker.

253: kōṭṭai-mēl-kīl-mēl - square with vertical line rising from mid-top and descending from mid-bottom - through-passage location post marker.

254: kōṭṭai-mēl-kīl-pirivu - square with horizontal line inside, vertical dash rising from top-left corner and descending from bottom-right corner - split-route location post marker.

255: kōṭṭai-mēr-pirivu-kīl - rectangle with mid horizontal line, vertical lines rising from both upper corners, vertical dash descending from bottom-right corner meeting horizontal line along bottom - split-foundation warehouse with upper twin posts and lower outlet marker.

256: kōṭṭai-mēr-kālam - vertical line with horizontal rectangle on top, vertical line reaching upper edge of rectangle - weigh-house post marker.

257: kaṭṭu-mēr-mūṇru - tall town marker (237) in center with small house (240) attached on each side - three-unit town cluster marker.

258: kaṭṭu-mēr-nālu-kāṭu - tall upright rectangle with four horizontal lines inside, square protruding right mid with inward dip - building with side extension marker.

259: kaṭṭu-mēr-kīl-pakkam - tall town marker (237) tilted 45° right, horizontal rectangle protruding mid-right, horizontal line at bottom third of main rectangle aligned with bottom of side rectangle - town post with side extension marker.

260: kōṭṭai-pattu-kāṭu - two vertical lines crossed, two horizontal lines mid and even extending right to form closed square on right side, single horizontal line inside square - warehouse with side extension marker.

261: kōṭṭai-kāṭu-mēr - square tilted 45° - residential compound marker.

262: kōṭṭai-kāṭu-mēr-vēl - square tilted 45°, three-prong trident at right tip pointing up and right - residential compound with triple outlet marker.

263: kōṭṭai-kāṭu-mēr-tāl - square tilted 45°, horizontal line crossing lower-right face - residential compound with lower outlet marker.

264: kōṭṭai-kāṭu-iru - square tilted 45°, two vertical dashes protruding outward at mid of each side - residential compound with side posts marker.

265: kōṭṭai-kāṭu-mēr-vāy - square tilted 45° with A-shape inside - residential compound with central gateway marker.

266: kōṭṭai-kāṭu-mēr-kālam - square tilted 45° with weigh-house tower (256) inside - residential compound with weigh-house marker.

267: kōṭṭai-kāṭu-mēr-kōṭṭai - square tilted 45° with smaller upright rectangle inside at top - residential compound with upper section marker.

268: maṇi-kīl-iru - two small ovals stacked vertically tip-to-tip, circle at the meeting point - paired sealed jars marker.

269: ḍātam-maṇi-mēr - oval with bent right arm crossing through to touch vertical line on left - protected pouch.

270: kōṭṭai-kāṭu-mēr-vēl-kīl - square tilted 45°, small inner square at top-mid left, three-prong trident protruding upward to left - residential compound with left triple inlet and upper left bay marker.

271: kōṭṭai-kāṭu-mēr-mūṇru - square tilted 45°, small inner square at top, three right-leaning vertical dashes on top-right face - residential compound with upper office and right triple outlet marker.

272: kōṭṭai-kāṭu-mēr-aiñcu - square tilted 45° with inner square at top, five upward rays on top (center vertical, outer two at 45°) - residential compound with upper office and five-branch inlet marker.

273: kōṭṭai-kāṭu-mēr-vēl-iru-mēl - square tilted 45° with inner square at top, twin vertical dashes rising from top left & right corners each ending in upward three-prong comb - residential compound with upper office and double upper triple inlet marker.

274: kōṭṭai-kāṭu-mēr-vēl-iru - square tilted 45° with inner square at top, twin vertical dashes rising from top left & right corners each ending in downward three-prong comb - residential compound with upper office and double left triple inlet marker.

275: kōṭṭai-kāṭu-mēr-kīl-tāl - square tilted 45° with inner square at top, bottom-left face thickened - residential compound with upper office and strengthened lower-left wall marker.

276: kōṭṭai-kāṭu-mēr-tāl - square tilted 45° with inner square at top, two right-leaning vertical dashes crossing bottom-left face - residential compound with upper office and lower-left outlet marker.

277: kōṭṭai-kāṭu-mēr-oṇru - square tilted 45° with inner square at top, single central vertical dash rising from bottom to touch inner square - residential compound with upper office and central support pillar marker.

278: kōṭṭai-kāṭu-mēr-nālu-tāl - square tilted 45° with open-bottom inner square at top releasing two descending dashes, four corner dashes - residential compound with lower double outlet and four-quarters marker.

279: kōṭṭai-kāṭu-mēr-tāl-kōṭi - square tilted 45° with open-bottom inner square at top releasing two descending dashes, extra small square inside on right corner - residential compound with lower double outlet and right add-on bay marker.

280: kōṭṭai-kāṭu-mēr-vēl-tāl - square tilted 45° with inner square at top, three-prong trident hanging downward from inner square - residential compound with lower triple outlet marker.

281: kōṭṭai-kāṭu-mēr-vēl-tāl-nālu - square tilted 45° with inner square at top, three-prong trident hanging downward from inner square, four corner dashes - residential compound with lower triple outlet and four-quarters.

282: kōṭṭai-kāṭu-mēr-vēl-tāl - square tilted 45° with inner square at top, vertical dash hanging from left of inner square ending in downward-right three-prong comb - residential compound with lower-right triple outlet marker.

283: kōṭṭai-kāṭu-mēr-vēl-tāl-kōṭi - square tilted 45° with inner square at top, vertical dash hanging from left of inner square ending in downward-right three-prong comb, extra small inner square on right - residential compound with lower-right triple outlet and right add-on bay marker.

284: kōṭṭai-kāṭu-mēr-cūlam - square tilted 45° with thick-lined plus sign inside - residential compound with central cross support marker.

285: kōṭṭai-kāṭu-mēr-cūlam-nālu - square tilted 45° with thick-lined plus sign inside, four corner dashes - residential compound with central cross support and four-quarters.

286: kōṭṭai-kāṭu-mēr-valai-cakkaram - square tilted 45° with small square at each inner corner, central six-petalled lotus with dot - residential compound with corner bastions and central wheel marker.

287: pattu - right bracket - ten-unit tally.

288: pattu-mēr-kīl - right bracket with horizontal dash hanging from left side at top third - ten-unit tally with horn ownership.

289: pattu-mēr-ēl - right bracket with seven vertical dashes at corners in 2-2-2-1 pattern - seventeen-unit tally.

290: pattu-mēr-aiñcu - right bracket with five upward-tilted dashes inside top third - ten-unit tally from five-canal town.

291: pattu-mēr-mūṇru-mēl - right bracket with two vertical lines flanking, three upward triangles on top third - ten-unit tally from triple ridge source.

292: pattu-nālu-kūṭal-iru - right bracket with four corner dashes, two horizontal offering bars inside right wall - ten-unit tally with double bowl.

293: nūru - right bracket with half-circle at mid height (open side attached to bracket) - hundred-unit tally.

294: irupatu - dual right brackets - twenty-unit tally.

295: irupatu-tāl - dual right brackets with downward shark-fin triangle on top-right of outer bracket - twenty-unit tally with lower-right outlet.

296: pattu-mūṭṭu - double right brackets with closed ends forming solid enclosure - decorated ten-unit tally.

297: pattu-aiñcu - double right brackets with closed ends forming solid enclosure, five evenly spaced horizontal lines inside - decorated ten-unit tally.

298: añcu-pattu - five nested right brackets - fifty-unit tally.

299: pattu - left bracket - ten-unit tally.

300: köṭṭai-kīl-kōṭi - left-facing bracket - origin frontier post.

301: nūru - left-facing bracket with half-circle right at mid-line (open side attached to bracket) - hundred-unit tally.

302: müṭṭu-mēr-pirivu (variant) - overlapping brackets with missing bottom-left and top notch - overlapping bracket variant.

303: irupatu-mēr-pirivu - right-facing bracket + left-facing bracket side by side, mirror pair with openings outward - twenty-unit tally.

304: vāli - classic D shape - bow weapon marker.

305: vāli-aiñcu - D shape bow with five right-leaning vertical dashes sprouting from top-right curve - five-unit bow marker.

306: vāli-aiñcu-kōṭi - D shape bow with five right-leaning vertical dashes sprouting from top-right curve, under right-facing hangman post - five-unit bow under post marker.

307: vāli-mēri - loaded bow with string drawn - strung bow marker.

308: vāli-mēri - loaded bow with string drawn, twin vertical dashes at each corner - strung bow gold standard across 4 quarters marker.

309: korado-iru-kīl - double stacked asymmetric pincers joined central - paired low-grade drag sled loads / twin foundation load set

310: kūṭal-müṭṭu-mēr-tāl - B shape with vertical stem right - possible twin ponds with canal outlet.

311: kinnaram-mūñru - sharp-angled D open on left, three evenly spaced vertical lines clustered left-of-center - three-string harp.

312: pattu - perfect half-circle, flat side down, dome pointing straight up - ten-unit tally.

313: irupatu - two identical upward-facing half-circles stacked directly one on top of the other - twenty-unit tally.

314: müpattu - three identical upward-facing half-circles stacked directly one on top of the other - thirty-unit tally.

315: elupatu - stack of seven identical upward-facing half-circles - seventy-unit tally.

316: vāy-bandar - arch with bold H shape centered inside - harbor gateway (Indus river outlet c. 2500 BC at undiscovered river delta outpost).

317: vāy-bandar-ēlu - arch containing seven vertical dashes (five upper, two lower variant) - harbor gateway with seven-river modifier (premium multi-channel sealed port at Indus river outlet c. 2500 BC undiscovered outpost).

318: vāy-bandar-kūṭil - arch with two lines merging upward + crossed horizontals under pointy roof - harbor with canal crossroads and tent village marker (sealed confluence near non-stone settlements at Indus river outlet c. 2500 BC undiscovered outpost).

319: poṇ-kālam - spiral shape resembling G - gold modifier (whatever tally follows is gold beads/units count).

320: poṇ-kōṭi - spiral shape resembling G with single right-leaning vertical dash sprouting from upper-right rim - protected gold modifier (gold beads/units count - possibly 319 with artist error).

321: parutti-kīl-iru - upside-down U with oval at each tip - cotton plant.

322: parutti-Y-kīl-iru - upside-down U with oval at each tip and Y inside - cotton plant on branches.

323: arasa-ilai - upside-down heart - basic peepal leaf marker / sacred leaf product.

324: paṭṭu-kōṭi - four-lobed cotton boll symbol - cotton boll cargo marker.

325: arasa-ilai-tūy - upside-down heart with vertical stalk underneath - peepal leaf on stem / attached branch marker.

326: arasa-ilai - inverted heart with vertical dash upward from bottom center and top point, two slightly outward-leaning vertical dashes in each lower lobe - peepal leaf with basic vein branches / textured leaf edges.

327: arasa-ilai-mēr - inverted heart with vertical dash upward from bottom center (midrib), three strongly tilted lines in each lower lobe, small square with 45° diagonal on top-left lobe, small upward triangle on top-right lobe - packaged peepal leaf / marked sacred leaf bundle.

328: vāy - U shape - harbor marker.

329: vāy-iru - U shape with two vertical dashes at the bottom - harbor with twin entrance marker.

330: *vāy-mūṇru* - U shape with three vertical dashes at the bottom entrance - harbor with three entrance posts.

331: *vāy-mūṇru-mēr* - U shape with floating central vertical line bending right 45° near top, ending in three short upward-left prongs - harbor with angled triple inlet.

332: *vāy-aiñcu-tāl* - plain rounded U open upward with five vertical dashes radiating downward from bottom center - harbor with five lower canals.

333: *vāy-mūṇru-tāl* - rounded U open upward with three vertical dashes radiating downward from bottom center (one straight, two at 45° left/right) - harbor with three lower canals.

334: *vāy-mūṇru-mēl* - plain rounded U open upward with three vertical dashes radiating downward from bottom center (one straight, two at 45°), small pointed roof/gable centered on top - harbor with three lower canals and roof cover.

335: *vāy-mūṇru-oṇru* - plain rounded U open upward with three vertical dashes radiating downward from bottom center (one straight, two at 45°), single floating vertical line inside the bowl - harbor with three lower canals and central post.

336: *vāy-kūtu-oṇru-kīl* - U-cup containing single vertical line with small oval at bottom - harbor with maritime beacon post.

337: *vāy-aiñcu-maṇi* - plain rounded U open upward, five vertical dashes radiating downward from bottom center, floating vertical line inside ending in small circle at lower end - harbor with five lower canals and maritime beacon post.

338: *kōt* - curved blade with four short vertical lines on top - axe head.

339: *kōt* - curved blade with roof/gable and three lines underneath - roofed axe head.

340: *vāy-mēl-iru* - U shape with small upward chevron/roof peak inside at one-third height - harbor with double upper roof.

341: *kōt* - curved blade form - axe head.

342: *kōt-vāy* - U shape with two short horizontal dashes on each rim - boat (canal/river/harbour/dock) *Kōt Vāy/Mohenjo-Daro*.

343: *kōt-vāy-oṇru* - U shape with two short horizontal dashes on each rim, single vertical dash at top center - boat (canal/river/harbour/dock) *Kōt Vāy/Mohenjo-Daro. Dock/entrance 1*.

344: *kōt-vāy-iru* - U shape with two vertical dashes at bottom entrance - boat (canal/river/harbour/dock) *Kōt Vāy/Mohenjo-Daro. Dock/entrance 2*.

345: *kōt-vāy-mūṇru* - U shape with three vertical dashes at bottom entrance - boat (canal/river/harbour/dock) *Kōt Vāy/Mohenjo-Daro. Dock/entrance 3*.

346: *kōt-vāy-mūṇru-kātu* - U shape with two short horizontal dashes on each rim, three vertical dashes at top and bottom center, 45° lines from outer bottom dashes ending in two short outward dashes each side - boat (canal/river/harbour/dock) *Kōt Vāy/Mohenjo-Daro. Dock/entrance 3 with triple space landing + canals/side extensions*.

347: *vāy-aiñcu-mēl* - U shape with three upward rays at each top rim (center straight, outer two at 45°) - harbor with five upper canals.

348: *vāy-mūṇru-kātu-nālu* - U shape with three upward rays on left top rim, right top rim with two horizontal bars (lower bar crossing side), each bar crowned by four upright vertical dashes centered on top - harbor with left triple inlet and right four-canal outlet.

349: *vāy-mūṇru-mēr-ōṭam* - U shape with three straight upward rays on both top rims, vertical line on left side with short horizontal arm reaching right toward U above mid-height - protected harbor with triple upper inlets and left-side access.

350: *vāy-mūṇru-ōṭam* - U shape with three straight upward rays on both top rims, short vertical dash on right at one-third height with 45° downward-leaning arm connecting bottom to mid-right side of U - harbor with triple upper inlets and right-side canal.

351: *vāy-mūṇru-maṇi-iru* - U shape with three straight upward rays on left top rim, right top rim curving inward to small oval, second identical small oval horizontal below it on right side - harbor with left triple inlet and right twin sealed jars.

352: *Kōṭṭalar-vāy-uru-mūṇru* - U shape with two short horizontal dashes on each side of left top rim, right top rim ending in three-prong trident - boat (canal/river/harbour/dock) *Kōt Vāy/Mohenjo-Daro. Dock with right triple outlet*.

353: Kōt-vāy-kambhat - boat (canal/river/harbour/dock) Kōt Vāy/Mohenjo-Daro - Gulf or outer harbor basin.

354: vāy-maṇi-mēr - U shape, floating central vertical line ending in small circle at bottom, single curved inward-then-upward prong at each top rim - harbor with central maritime beacon post and twin curved inlets.

355: vāy-kūṭal-cakkaram - U-shaped harbor basin with six top inlets and central 6-spoke wheel - harbor under Cakravartin wheel authority.

356: vāy-309 - U shape with downward-pointing triangle inside the V point with X centered inside the triangle - harbor associated with 309 location.

357: vāy-mūṇṛu-mūṇṛu - U shape with three upward rays at each top rim, flattened X inside the V point - harbor with triple inlets each rim and central junction.

358: vāy-kūṭal-iru-kōṭi - U-shaped harbor basin with twin top flags - flagged harbor.

359: vāy-mūṇṛu-kāṭu - U shape, left top rim with quarter-circle flag containing short horizontal dash, right top rim with two horizontal bars (lower crossing side), each crowned by 5 upright vertical dashes (lower bar has 2 each side of the line) - harbor with left flag and right five-canal outlets.

360: vāy-kūṭal-iru-kōṭi-cūḍam - U-shaped harbor basin with twin top flags and left spear - flagged harbor with spear guard marker.

361: vāy-kōṭi-iru-mēl - U shape with twin quarter-circle flags on both top rims each containing short horizontal dash, upward-pointing open triangle centered inside V with apex at mid-height - harbor with twin flags and central triangle.

362: vāy-nandu-kōṭi - U-shaped harbor basin with crab pincer inside and grapevine cross on each tip - harbor with crab and grapevine cargo.

363: vāy-nandu-kōṭi-iru - U-shaped harbor basin with crab pincer inside and two grapevine crosses on each tip - harbor with crab and double grapevine cargo.

364: vāy-nandu-āl - U-shaped harbor basin with crab pincer inside and stickman heads on each tip - harbor with crab cargo and clerk administration.

365: paṭam-kāy - V with vertical line inside - wheat bundle.

366: vāy-kūṭu-oṇṛu - U-cup containing single vertical line with skinny rectangle slanting down-left at bottom - harbor with lower-left outlet.

367: paṭam-kāy - seeded grain heads bundle - seeded wheat bundle.

368: vāy-kōṭi-maṇi-mūṇṛu - U-shaped harbor basin with three lines (two sides + central post), each tip topped by grapevine cross and circle cap - harbor with grapevine cargo.

369: vāy-kōṭi-maṇi-mūṇṛu - U-shaped harbor basin with three lines (two sides + central post), each tip topped by grapevine cross and circle cap - grapevine cargo harbor variant.

370: vāy-kōṭi-mēl-mūṇṛu - U-shaped harbor basin with three lines (two sides + central post), each tip topped by pointed shark-fin and circle cap - harbor with pointed roof caps.

371: kōṭ-vāy-kīl-mūṇṛu (342)boat (canal/river/harbour/dock) Kōt Vāy/Mohenjo-Daro, with extra central notch + middle vertical line + three side notches - inner basin.

372: vāy-mūṇṛu-maṇi-iru-kīl - U-shaped harbor basin with three straight upward rays on right top rim, left top rim inward-facing small oval + second identical oval horizontal below it, center line with circle at mid - harbor with right triple inlet and left twin sealed jars.

373: ūṭu - plain oval - fenced village.

374: ūṭu-kīl - small oval - junior fenced village.

375: ūṭu-oṇṛu-mēr - oval with centered floating vertical line full height (not touching rim) - fenced village with central post.

376: ūṭu-oṇṛu-mēr-kōṭi - oval with centered floating vertical line, top-right shark-fin sail pointing top-right - fenced village with frontier sail.

377: kīṭakku-ūṭu-oṇṛu-maṇi-kāṭu - eastern fenced village with sealed jar post and four-quarters.

378: ūṭu-oṇṛu-tūy - oval with centered vertical line touching top and bottom - divided fenced village.

379: ūṭu-mūṇṛu-kīl - oval with three stacked horizontal slanting lines inside - fenced village with three slanted lines.

380: ūṭu-cakkaram - oval with six crossing diagonal lines - fenced village with lattice.

381: ūtu-iru-kīl-tāl - oval with two tilted squares side-by-side at mid-height - fenced village with twin tilted squares.

382: ūtu-iru-kātu - oval with two stacked slanting horizontals at center, each sprouting four prongs - fenced village with double four-canal.

383: ūtu-vēl-aiñcu-kīl - oval with smaller oval inside on right, left vertical dash with five prongs - fenced village with five-canal inlet and right sub-compound.

384: ūtu-kātu-mēr - oval with centered vertical line, overlaid tilted diamond with two extensions per face - fenced village with diamond reinforcement and side arms.

385: ūtu-vāy-kōti - plain oval with grapevine cross inside - fenced vineyard village.

386: ūtu-kīl-ōnru - oval with single vertical dash rising from bottom center to mid-height - low fenced village.

387: ūtu-trivel - oval with full-height trident centered inside (three prongs from bottom base) - fenced village at three-canal delta.

388: ūtu-trivel-nālu - oval with three-prong trident inside plus four corner dashes - fenced village at three-canal delta with four-quarters.

389: ūtu-mūn̄ru-kīl-mēr - oval with lower bottom dash, mid tilted dash with three prongs pointing top-left - fenced village with three western inlets.

390: ūtu-mūn̄ru-kīl-mēr-nālu - oval with lower bottom dash, mid tilted dash with three prongs pointing top-left, four corner dashes - fenced village with three western inlets and four-quarters.

391: cakkaram - six-spoke circle - wheel symbol / traders' authority marker

392: cakkaram-cūlam-iru-nālu - six-spoke wheel with twin left pillars and four corner dashes - Cakravartin wheel authority with gateway and four-quarters.

393: kūt̄ai-mēl-cakkaram - tall dome roof with six-spoke wheel inside and twin side posts - domed structure under Cakravartin wheel authority.

394: kōt̄-vāy - oval with (342) boat (canal/river/harbour/dock) Kōt̄ Vāy/Mohenjo-Daro on top - Mohenjo-Daro village.

395: kōt̄ai-vēl-kīl-nālu - lower half perfect dome, upper half vertical line slanting right with three short prongs at top pointing left, horizontal line beneath dome, four evenly spaced vertical dashes below - warehouse with left-facing three-canal roof and four-unit lower tally.

396: kīlakku - vertical line + oval on top containing a smaller circle inside - east / sunrise direction (stemmed rising sun).

397: kīlakku - vertical line with perfect circle at mid-height completely covering the line, small dot centered inside circle - east / certified sunrise origin (sun disc with central point).

398: nūl-mēr-kīl - cotton on reel / bobbin on spindle (oval body with slanted lines as wound thread, V top as spindle/hook) - cotton reel.

399: aiñcu-vāy-kūtu-ōnru - lower vertical dash as base, large perfect standing oval above it, five short upward rays crowning the top - five-river northern inflow to central pond with single southern outflow.

400: pū - slanting stem with oval flower head + leaf pair - flower cargo.

401: pū-iru - flower between two vertical lines - flower cargo at gateway.

402: kōti-mēr-iru - full-height vertical line leaning right, large shark-fin at top-right pointing top-right containing two smaller vertical lines inside - frontier outpost with double post.

403: mañi-iru - two overlapping ovals - twin villages in contact / merged dual cargo / joint consignment from two sources.

404: ūtu-iru - two overlapping ovals side-by-side - twin villages in contact / dual settlements merged.

405: ūtu-iru-vēl-kīl - two perfect standing ovals side-by-side with slight overlap, right oval crowned by 45° horizontal line carrying three short prongs at 90° pointing left - twin villages in contact with left-facing three-canal feed.

406: ūtu-iru-mūn̄ru - two perfect standing ovals side-by-side with slight overlap, floating vertical dash in each of three spaces (left oval, overlap, right oval) - three-unit twin villages / triple merged settlements.

407: ūtu-iru-mēl-pirivu - paired ovals with upward-slanting split lines - twin villages with split route.

408: ūtu-iru-kūṭal - two perfect standing ovals side-by-side, joined at mid-height by single horizontal dash - twin villages with central join/meeting

409: ūtu-iru-kūṭal-kīl - two perfect standing ovals side-by-side joined at mid-height by single horizontal dash, vertical line rising from below to meet center of dash - twin villages with central join and lower canal/road feed.

410: muṇai - vertical figure-8 loop - bead trade modifier (basic "counted/paid in beads").

411: muṇai-tūy-mēl - vertical figure-8 under flat angled roof - bead trade under warehouse authority / stored bead value.

412: muṇai-mēl-mūṇru - horizontal figure-8 with three rising steps right - stepped-up bead value / three-grade bead currency.

413: muṇai-cūlam - vertical figure-8 with left spear - guarded/secured bead chain payment.

414: muṇai - vertical figure-8 pierced by central vertical line - standard bead chain on string (core marker bead / guru bead).

415: mūṇru-muṇai - triple stacked figure-8 loops - high-value triple bead chain / currency.

416: mūṇru-muṇai-cūlam - triple figure-8 between twin pillars - gateway-certified triple bead chain currency.

417: mūṇru-muṇai-tūy - triple figure-8 pierced centrally - triple bead chain with central string/post (premium sealed bead currency).

**Additional:**

418: ūtu - kōṭṭ - fenced village with central square/building/fort.

419: vāy - kūṭtu - nālu-X - four-branch crossover-merge river post.

420: muṇai - iru - two wavy vertical lines - snaking river route.

421: nālu - vāy - kūṭtu - mēl - four lines going up and converging at the top under a pointy roof, with two horizontal lines midway - four-canal upward confluence warehouse marker.

422: vāy - kūṭtu - aiñcu - iru - five-branch symmetric double-merge river post.

423: korado - vēl - nālu - pincer with four upward rivers feeding mid - forge tool at four-canal confluence.

424: uppu - ēlu - kūṭal - grid of 8 squares (2 across, 4 down) - salt farm pans marker.

425: vāy - oṇru - U shape with single vertical line inside - single-unit harbor.

426: kōl - vertical line curving over at top to right with hanging return halfway + horizontal dash crossing near top - ruler's sceptre or herder's crook).

427: oṇru - muṭṭai - solid-sided X with small vertical dash in left lobe - single sealed bundle.

428: pattu - open left bracket with crossing vertical line - ten-unit tally. (Variant)

429: uppu - mūṇru - kiram - criss-cross grid (tilted 45°) - diamond lattice tally / salt farm pans.

430: vāy - kūṭtu - iru - kīl - double crossed river location.

431: vāy - kōṭṭai - pirivu - mēl - roofed Y with arms - canal lock river location.

432: kālam - kūṭtu - vertical beam through a centered rectangle containing two horizontal lines - weigh-bridge marker.

433: muṇai - vāy - ēlu - seven interconnected loops in circle - seven rivers joined.

434: vāy - kūṭtu - muṇru - kuṭam - two vertical lines close together (bottom 1/4 slants right, mid 2/4 slants left), with three squares stacked on top half - canal system feeding into three ponds (water lock / stepped reservoir marker).

*This work is a personal, ongoing reconstruction of the Indus script based on Mahadevan's concordance and a working Old Tamil phonetic rebus system. Because the script remains undeciphered and many signs are open to interpretation, a lot of the readings and sign meanings here are educated guesses. They're the best fit I've found so far, but they're not final or proven. When signs get corrected or new evidence comes up, the rebus chains will shift, so most of the the current interpretations are likely wrong in detail.*

*The core theory (short phonetic chains from signs → natural Old Tamil → rebus messages) feels solid, but treat the specific translations as provisional and experimental.*

*This is just one person's attempt to crack it. Feedback, critiques, or better ideas are welcome.  
~ I look forward to updating and refining the interpretation.*

## Examples of seals being translated



M-1a

Right-facing bull on decorated stand

Signs (right to left): 397 → 51 → 267 → 402 → 98

Ledger layer (practical receipt):

397: kilakku - east / certified sunrise origin (sun disc with central point)

51: kōli-kaṭṭu - processed chicken cargo.

267: kōṭṭai-kāṭu-mēr-kōṭṭai - residential compound with upper section.

402: kōṭi-mēr-iru - frontier outpost with double post.

98: onru - 1 unit tally (variant form/standard product modifier).

Read: Standard-grade processed chicken cargo from Eastern location, destined for residential compound with upper section, via frontier outpost with double post.

Rebus layer (first sounds only, head to tail):

Glyphs: 397 → 51 → 267 → 402 → 98

Phonetic chain: kiḷ kōl kōt kō onru

Natural Old Tamil: “kiḷ kōl kōṭu kōnru”

Translation: East (kiḷ) - authority/rule (kōl) - fort/high place (kōṭu) - ruler/chief (kō) - one/single (onru).

Interpretation: “The ruler of the eastern authority fort”



M-3a

Right-facing bull on decorated stand

Signs (right to left): 212 → 87 → 341

Ledger layer (practical receipt):

212: tī-vēli - fire altar on stand / hearth beacon marker.

87: iru - two-unit tally.

341: kōṭ - axe head.

Read: Two axes cleared at reinforced checkpoint.

Rebus layer (first sounds only, head to tail):

Glyphs: 212 → 87 → 341

Phonetic chain: kāl iru kō

Natural Old Tamil: "kālīru kō!"

Translation: Elephant (kālīru) king (kō)

Interpretation: "Elephant-King"



M-4 a

M-4a

Right-facing bull on decorated stand

Signs (right to left): 89 → 424 → 424 → 223 → 99 → 70 → 336 → 89 → 426 → 180

Ledger layer (practical receipt):

89: mūṇru - three-unit tally.

424: uppu - ēlu - kūṭal - eight-unit salt farm pans marker.

424: uppu - ēlu - kūṭal - eight-unit salt farm pans marker.

223: korado-mūṇru-kīl - drag sled load with triple attachment/modifier.

99: mēl-iru - gateway marker (departure or destination modifier).

70: mīṇ-oṇru - one unit dried/salted fish cargo.

336: vāy-kūṭu-oṇru-kīl - harbor with maritime beacon post.

89: mūṇru - three-unit tally.

426: kōl - ruler's sceptre or herder's crook.

180: vāy-mūṇru-kūṭtu - seven-line confluence river post.

Read: Three dual salt farm full load (x3), gateway modifier, dried/salted fish cargo sealed in jars - three units total, to the ruler at the place where 4 rivers merge into 3.

Issued under decorated-stand bull authority (northern plains core admin).

Rebus layer (first sounds only, head to tail):

Glyphs: 89 424 424 223 99 70 336 89 426 180

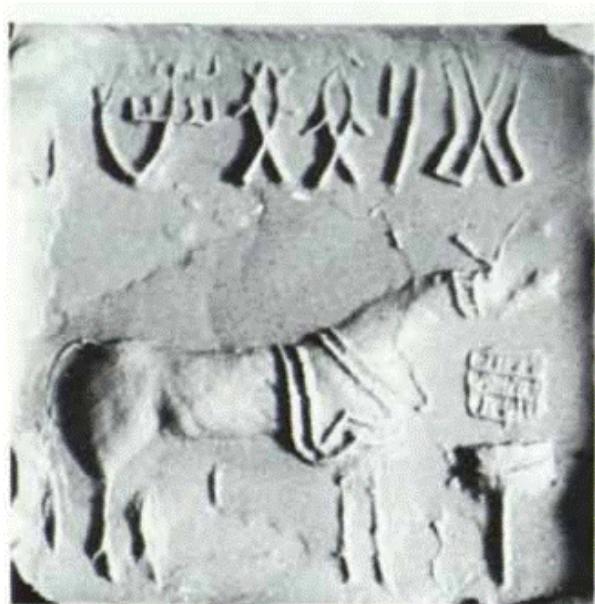
First syllables: mū → uu → ko → mēl → mī → vā → mū → kō → vā

Phonetic chain: mū uu ko mēl mī vā mū vā vā

Natural Old Tamil: “Mū uu kō mēl mī vā mū kō vā!”

Translation: “Ancestor (mū) - oh (uu) - king (kō) - high (mēl) - upon(mī) - come (vā) - ancestor (mū) - ruler(kō) - come (vā).”

Interpretation: “Ancestor oh King, high upon come, ancestor ruler come”



M-5 a

M-5a

Right-facing bull on plain stand

Signs (right to left): 150 → 123 → 59 → 67 → 348

Ledger layer (practical receipt):

150: Māvalai - Māvalai/Kalibangan city, - inland waterway & trade network.

123: mēl-pirivu - high-status marker (post-departure modifier).

59: mīṇ - standard fish cargo.

67: mīṇ-kaṭal - walking catfish cargo.

348: vāy-mūṇru-kāṭu-nālu - harbor with left triple inlet and right four-canal outlet.

Read: High-status standard fish and walking catfish cargo from Kalibangan, destined for harbor with left triple inlet and right four-canal outlet.

Rebus layer (first sounds only, head to tail):

Glyphs: 150 → 123 → 59 → 67 → 348

First syllables: Mā → mēl → mī → mī → vāy

Phonetic chain: Mā mēl mī mī vāy

Natural Old Tamil: ““Mā mēlum mīvāy””

Translation: Mā(kāl) elevation(mēlum) fish/star-harbour/opening(mī-vāy)

Interpretation: black above fish/star-harbour/opening



M-6 a

M-6a

Right-facing bull on decorated stand

Signs (right to left): 83 → 125 → 286 → 391

Ledger layer (practical receipt):

83: kōti - mēl - processed Great Indian Bustard cargo.

125: mēl - pirivu - single-unit tally (high-status modifier).

286: kōṭṭai - kāṭu - mēr - valai - cakkaram - residential compound with corner bastions and central wheel marker.

391: cakkaram - wheel symbol / traders' authority marker

Read: Single-unit processed Great Indian Bustard cargo destined for residential compound with corner bastions and central wheel authority.

Rebus layer (first sounds only, head to tail):

Glyphs: 83 → 125 → 286 → 391

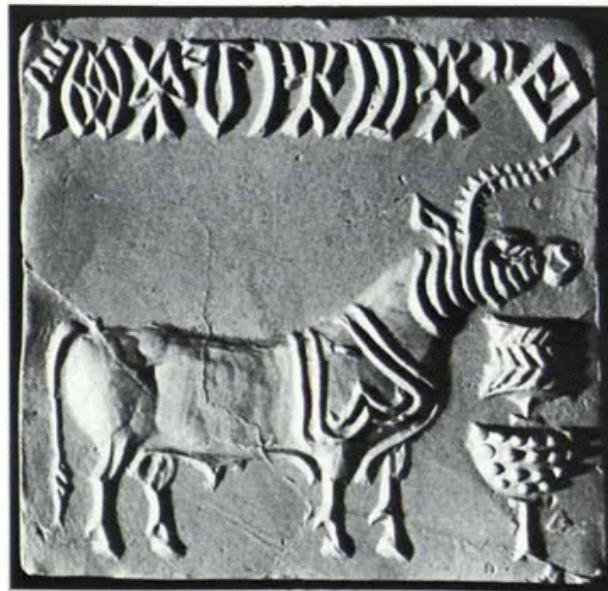
First sounds: kō (kōti) + oṇ (oṇru) + kō (kōṭṭai) + ca (cakkaram)

Phonetic chain: kō oṇ kō ca

Natural Old Tamil flex: "Kō oṇkō ca"

Translation: "King (kō) - one (oṇru) - King (kō) - wheel/act (cakkaram)."

Interpretation: "The One King [of] the Wheel"



M-7 a

M-7a

Right-facing bull on decorated stand

Signs (right to left): 267 → 99 → 67 → 296 → 9 → 342 → 17 → 407 → 169

Ledger layer (practical receipt):

267: kōṭṭai - kāṭu - mēṛ - residential compound with upper section.

99: mēl-iru - gateway marker (departure or destination modifier).

67: mīṇ - kaṭal - walking catfish cargo.

296: pattu - mūṭṭu - decorated ten-unit tally.

9: āl - mēṛ - gateway armed guard.

342: kōṭṭalar-vāy - boat (canal/river/harbour/dock) Kōṭṭalar/Mohenjo-Daro.

17: āl-vāl - guard / armed enforcer.

407: ūṭu-iru-mēl-pirivu - twin villages with split route.

169: kōṭu-kīl-nālu-nīr - four-stage falling tributary marker.

Read: From residential compound gateway, 10 walking-catfish cargo in decorated pack, to Mohenjo-Daro dock, under guard to twin villages with split route.

Rebus layer (first sounds only, right to left):

Glyphs: 267 → 99 → 67 → 296 → 9 → 342 → 17 → 407 → 169

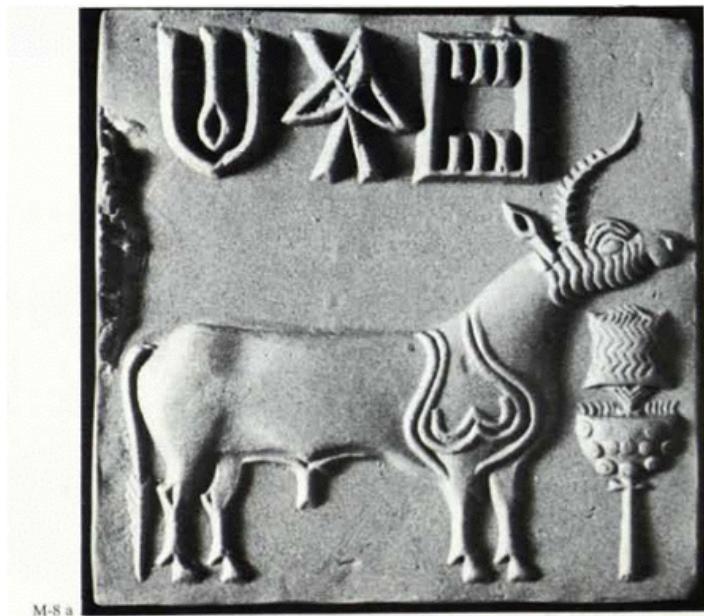
First sounds: kō (kōṭṭai) + tō (tōl) + mī (mīṇ) + pa (pattu) + āl (āl-mēṛ) + kōṭ (kōṭṭalar) + āl (āl-vāl) + ūṭu (ūṭu-iru) + kō (kōṭu)

Phonetic chain: kōt tō mī pa āl kōṭ āl ū kō

Natural Old Tamil: “Kōttō mīpāl kōṭ āl ū kō”

Translation: to take, to seize/ Having seized (kōttō) - great sword (mīpāl) - fort-man/guard(kōṭ-āl) - Will you give (it)?(ū kō.)

Interpretation: “Did I not seize the supreme sword, guard? Will you give (it/one)?”



M-8a

Right-facing bull on decorated stand

Signs (right to left): 244 → 17 → 336

Ledger layer (practical receipt):

244: kōṭṭai-eṭṭu - eight-bay warehouse marker.

17: āl-vāl - stickman with sword - guard / armed person.

336: vāy-kūṭu-oṇṭu-kīl - harbor with maritime beacon post.

Read: Cargo from eight-bay warehouse under guard / armed person, destined for harbor with maritime beacon post.

Rebus layer (first sounds only, head to tail):

Glyphs: 244 → 17 → 336

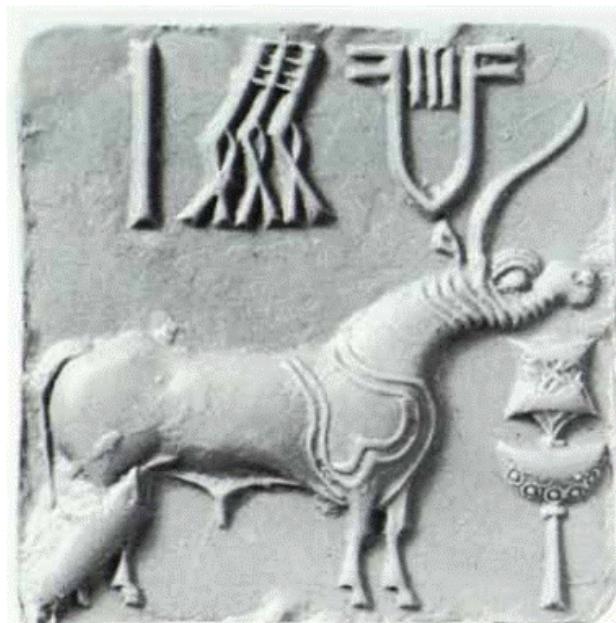
First sounds: kō (kōṭṭai) + āl (āl-vāl) + vā (vāy)

Phonetic chain: kō āl vā

Natural Old Tamil: “Kōṭ āl vāy”

Translation: “Fort (kōṭ) - man (āl) - harbor (vāy).”

Interpretation: “Harbour guard.”



M-9 a

M-9a (departure seal)

Right-facing bull on decorated stand

Signs (right to left): 345 → 421 → 86

Ledger layer (practical receipt):

345: köttalar-vāy-mūnru - boat (canal/river/harbour/dock) Köt̄talar/Mohenjo-Daro. Dock/entrance 3.

419: vāy-kūt̄tu-nālu-X - four-branch crossover-merge river post.

86: onru - one-unit tally.

Read: One-unit consignment departing from notched harbor with three entrance posts, via four-branch crossover-merge river confluence.

Rebus layer (first sounds only, head to tail):

Glyphs: 345 → 421 → 86

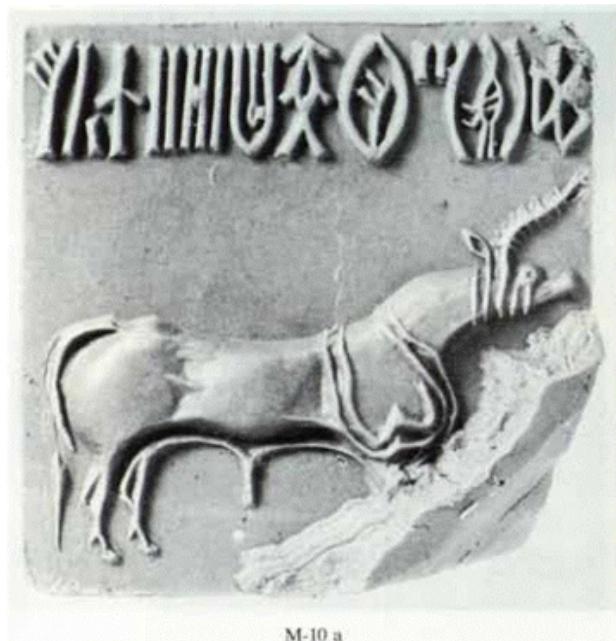
First sounds: kō (kōt̄) + vā (vāy) + o (onru)

Phonetic chain: kō vā o

Natural Old Tamil flex: "kōvā on̄"

Translation: Sacred bull (kōvā) - one (on̄).

Interpretation: "The one Bull"



M-10a

Right-facing bull

Signs (right to left): 233 → 81 → 99 → 389 → 65 → 336 → 106 → 155 → 124 → 169

Ledger layer (practical receipt):

233: kōṭu-mūṇru-mēr - Kōṭ-vāy/Mohenjo Daro inner city map marker (gateway fort inner layout).

81: kōli-Koodai - traditional chicken coop or basket used to house or transport poultry.

99: mēl-iru - gateway marker (departure or destination modifier).

389: ūṭu-mūṇru-kīl-mēr - fenced village with three western inlets.

65: mīn-mēl - processed fish cargo (temple/warehouse grade).

336: vāy-kūṭu-oṇṇu-kīl - harbor with maritime beacon post.

106: aintu - five-unit tally.

155: vāy-kōṭi - grapevine cargo marker.

124: mēl-pirivu Upside-down Y with detached arm - high-status marker (variant form, post-departure modifier).

169: kōṭu-kīl-nālu-nīr - main drainage canal-tree map.

Read: Double tally processed chicken and processed fish cargo from Kōṭ-vāy/Mohenjo Daro, stored in fenced village with three western inlets, destined for harbor with maritime beacon post – five standard-grade units of grapevine cargo (one unit standard marker), via main drainage canal-tree route.

Rebus layer (first sounds only, head to tail):

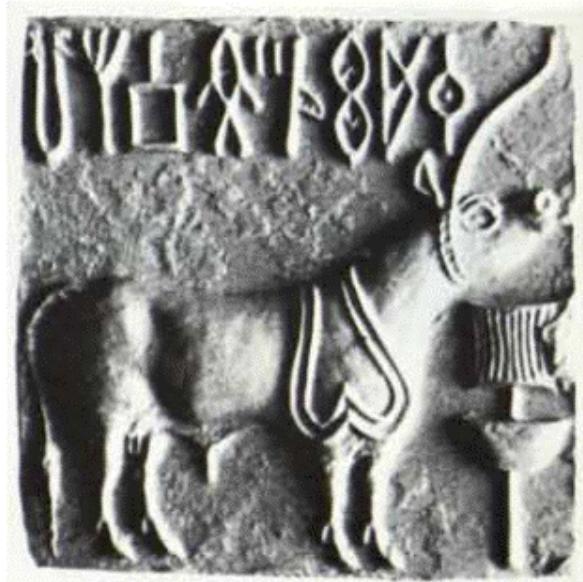
Glyphs: 233 → 81 → 99 → 389 → 65 → 336 → 106 → 155 → 124 → 169

First sounds: kō (kōṭu) + ko (kōli) + mēl(mēl) + ū (ūṭu) + mī (mīn) + vā (vāy) + ai (aintu) + vā (vāy) + mēl (mēl) + kōṭ (kōṭu)

Phonetic chain: kō ko<sub>l</sub> mēl ū mī vā ai vā mēl kō

Translation: King own (kō ko<sub>l</sub>) - high(mēl) - this-inside (ū) - going beyond (mī-vā) - five-harbor (ai-vā) - high (mēl) - king(kō).

Interpretation: "King owns upper inland beyond five-harbour high king"



M-12 a

M-12a

Right-facing bull (non decorated stand)

Signs (right to left): 397 → 307 → 268 → 402 → 99 → 59 → 249 → 162 → 342

Ledger layer (practical receipt):

397: *kilakku* - vertical line with perfect circle at mid-height completely covering the line, small dot centered inside circle - east / certified sunrise origin (sun disc with central point).

307: *vāli-mēri* - loaded bow marker.

268: *maṇi-kīl-iru* - paired sealed jars marker.

402: *kōṭi-mēr-iru* - frontier outpost with double post.

99: *mēl-iru* - gateway marker (departure or destination modifier).

59: *mīṇ* - standard fish cargo.

249: *kōṭṭai-mēr-kīl-oṇru* - single-unit warehouse with central post marker.

162: *vēl-kīl* - wooden stirrer for brick pits.

342: *kōṭ-vāy* - boat (canal/river/harbour/dock) *Kōṭ Vāy/Mohenjo-Daro*.

Read: From the East + loaded bow cargo + paired sealed pouches departing frontier outpost with double post, via gateway, containing standard fish cargo, to single-unit warehouse with central post via three-canal river, final destination Mohenjo-Daro.

Rebus layer (first sounds only, head to tail):

Glyphs: 397 → 307 → 268 → 402 → 99 → 59 → 249 → 162 → 342

First sounds: *ki* (*kil*) + *vā* (*vāli*) + *ma* (*maṇi*) + *kō* (*kōṭi*) + *mēl* (*mēl*) + *mī* (*mīṇ*) + *kōṭ* (*kōṭṭai*) + *vē* (*vēl*) + *vā* (*vāy*)

Phonetic chain: *ki vā ma kō mēl mī kō vē vā*

Natural Old Tamil: “*Ki vā ma kō mēl mī kō vē vā*”

Translation: “Lower(*ki*) - harbor (*vā*) - Dark/Black(*ma*) - king (*kō*) - high (*mēl*) - above/superior (*mī*) - king (*kō*) - to burn, scorch (*vē vā*).”

Interpretation: “Lower harbor black king superior king to burn.”



M-13 a

M-13a

Right-facing bull (non decorated stand)

Signs (right to left): 28 → 180 → 402

Ledger layer (practical receipt):

28: āl-vāli-mēṛi - ready archer (guarded/armed marker).

180: vāy-mūṇru-kūṭṭu - seven-line confluence river marker.

402: kōṭi-mēṛ-iru - frontier outpost with double post.

Read: Guarded cargo departing via seven-line river confluence route, destined for frontier outpost with double post.

Rebus layer (first sounds only, head to tail):

Glyphs: 28 → 180 → 402

First sounds: āl (āl-vāli) + vā (vāy) + kō (kōṭi)

Phonetic chain: āl vā kō

Natural Old Tamil: “āl vā kō”

Translation: “Man (āl) - hail/come (vā) - king (kō).”

Interpretation: “Man becomes King”



M-14 a

M-14a

Right-facing bull (non decorated stand)

Signs (right to left): 267 → 99 → 204 → 367 → 342

Ledger layer (practical receipt):

267: kōṭṭai-kātu-mēr - residential compound with upper section.

99: mēl-iru - gateway marker (departure or destination modifier).

204: paṭṭu - textile.

367: paṭjam-kāy - seeded wheat bundle.

342: kōṭ-vāy - boat (canal/river/harbour/dock) Kōṭ Vāy/Mohenjo-Daro.

Read: Seeded wheat bundle cargo departing from fortified residential compound with upper section, via gateway and three-bay weigh-house, destined for notched harbor basin.  
(Classic grain shipment weighed and cleared for export to notched harbor.)

Rebus layer (first sounds only, head to tail):

Glyphs: 267 → 99 → 204 → 367 → 342

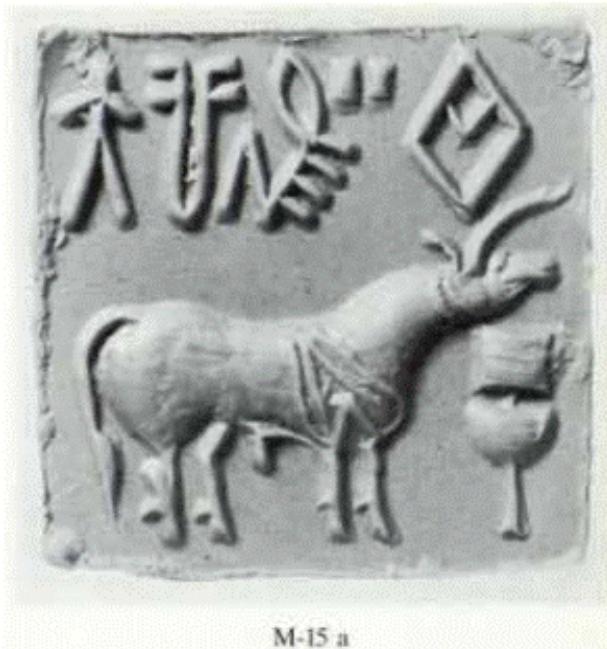
First sounds: kōṭ (kōṭṭai) + mēl (mēl) + pa (paṭṭu) + pa (paṭjam) + kō (kōṭ)

Phonetic chain: kō mēl pa pa kō

Natural Old Tamil: “kōṭmēl paṭpaṭkō”

Translation: High fort, ancient cloth king

Interpretation: “The king of the ancient high fort cloth”



M-15a

M-15 a

Right-facing bull (non decorated stand)

Signs (right to left): 267 → 99 → 48 → 342 → 1

Ledger layer (practical receipt):

267: kōṭṭai-kāṭu-mēr - residential compound with upper section.

99: mēl-iru - gateway marker (post-departure).

48: āl-tūki-nālu - night-watch with bedding tally.

342: kōṭ-vāy - boat (canal/river/harbour/dock) Kōṭ-vāy (gateway fort dock).

1: āl - person/clerk.

Read: A clerk/cargo departing fortified residential compound with upper section, via gateway, night tally/shipment, destined for gateway fort dock (Kōṭ-vāy).

Rebus layer (first sounds only, head to tail):

Glyphs: 267 → 99 → 48 → 342 → 1

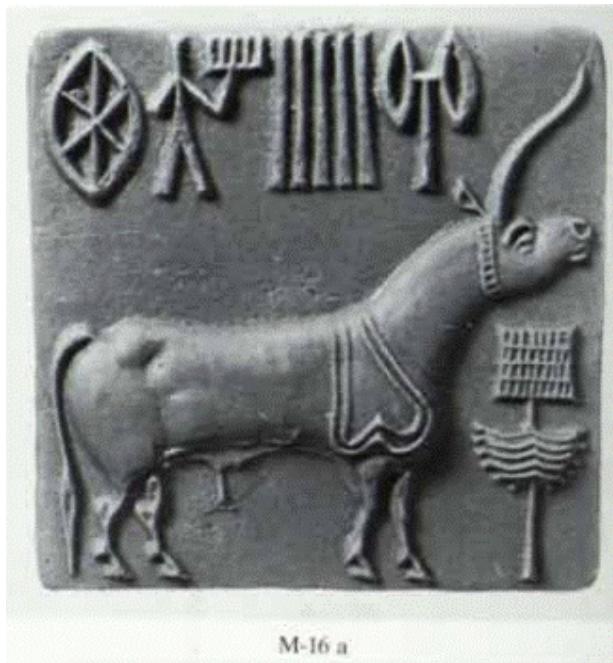
First sounds: kō (kōṭṭai) + mēl (mēl) + tū (tūki) + kōṭ (kōṭ-vāy) + ā (āl)

Phonetic chain: kō mēl tū kōṭ ā

Natural Old Tamil: “Kō mēl tū kōṭ ā!”

Translation: King high raise fort man.

Interpretation: “The high king's raised fort man”



M-16a

Right-facing bull on (decorated stand)

Signs (right to left): 409 → 96 → 19 → 391

Ledger layer (practical receipt):

409: maṇi-iru-oṇru-kīl - paired sealed pouches with lower central post.

96: aintu - 5 units tally.

19: āl-vēl - five-canal port authority.

391: cakkaram - wheel symbol / traders' authority marker.

Read: 5 units of paired sealed pouches with central post - allocated to five-canal port, under Cakravartin wheel authority.

Rebus layer (first sounds only, head to tail):

Glyphs: 409 → 96 → 19 → 391

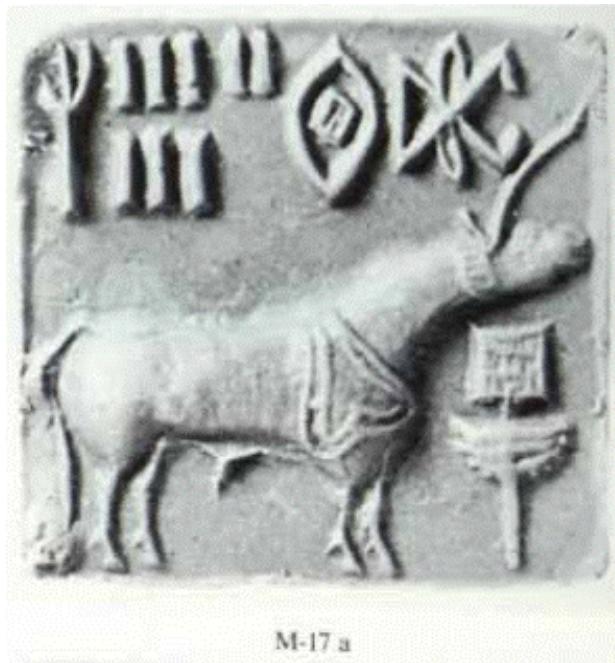
First sounds: ma (maṇi) + ai (aintu) + vē (vēl) + ca (cakkaram)

Phonetic chain: ma ai vē ca

Natural Old Tamil: “Ma ai vēl ca”

Translation: “Black/dark (ma) - five (aintu) - conquer (vēl) - wheel (cakkaram).”

Interpretation: “Black Five Conquered Wheel.”



M-17.a

M-17a

Right-facing bull (non decorated stand)

Signs (right to left): 220 → 418 → 99 → 109 → 162

Ledger layer (practical receipt):

220: korado-müttu-kātu - sealed tongs bundle with four-quarters marker.

418: ūtu-kot̪ - fenced village with central square/building/fort.

99: mēl-iru - gateway marker (departure or destination modifier).

109: āru - six-unit tally (three upper + three lower).

162: vēl-kīl - wooden stirrer for brick pits.

Read: Sealed tongs bundle (four-quarters certified) from fenced village with central fort, via gateway, six-unit consignment, route via three-canal river.

Rebus layer (first sounds only, head to tail):

Glyphs: 220 → 418 → 99 → 109 → 162

First sounds: kor (korado) + ū (ūtu) + mēl (mēl) + ā (āru) + vē (vēl)

Phonetic chain: ko ū mēl ā vē

Natural Old Tamil: “Ko! ūtu mēl āru vē!”

Translation: “Possess (ko!) - settlement (ūtu) - high (mēl) - river (āru) - conquer (vēl).”

Interpretation: “Hold the settlement, high river, conquer.”



M-18 a

M-18a

Right-facing bull (decorated stand)

Signs (right to left): 121 → 342 → 421

Ledger layer (practical receipt):

121: paṇṇ iraṇṭu - twelve vertical lines - 12 units tally.

342: kōṭ-vāy - boat (canal/river/harbour/dock) Kōṭ Vāy/Mohenjo-Daro.

421: nālu - vāy - kūṭṭu - mēl - four-canal upward confluence warehouse marker.

Read: 12-unit consignment destined for notched harbor basin, stored/processed at four-canal upward confluence warehouse.

Rebus layer (first sounds only, head to tail):

Glyphs: 121 → 342 → 421

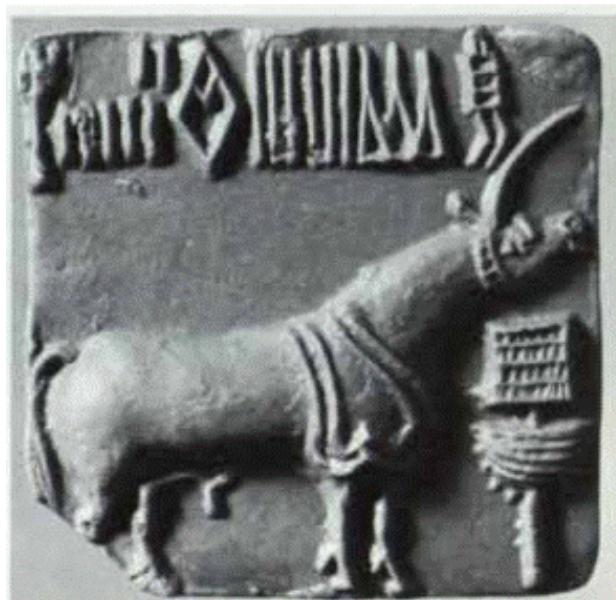
First sounds: pa (paṇṇ) + vā (vāy) + nā (nālu)

Phonetic chain: pa vā nā

Natural Old Tamil: “Pa vāy nā!”

Translation: “Tree/fruit (pa) - harbor (vā) - day/time (nāl).”

Interpretation: “The Fruit-Harbor’s Day.”



M-20 a

M-20a

Right-facing bull (decorated stand)

Signs (right to left): 434 → 230 → 108 → 267 → 99 → 96 → 162

Ledger layer (practical receipt):

434: vāy - kūt̄tu - muṇru - kuḷam - canal system feeding into three ponds (water lock / stepped reservoir marker).

230: mūṇru-kōṭu - three-ridge mountain location marker (western Kohistan hills, Gaj-Tharo-Buri cluster).

108: āṛu - six-unit tally.

267: kōṭṭai - kāṭu - mēṛ - residential compound with upper section.

99: mēl-iru - gateway marker (departure or destination modifier).

96: aintu - five-unit tally.

162: vēl-kīl - wooden stirrer for brick pits.

Read: Six-unit (plus five-unit) consignment from three-ridge mountain outpost, via water lock/stepped reservoir system, to residential compound with upper section, post-departure via gateway, route via three-canal river.

Rebus layer (first sounds only, head to tail):

Glyphs: 434 → 230 → 108 → 267 → 99 → 96 → 162

First sounds: vā (vāy) + mū (mūṇru) + ā (āṛu) + kō (kōṭṭai) + mēl (mēl) + ai (aintu) + vē (vēl)

Phonetic chain: vā mū ā kō mēl ai vē

Natural Old Tamil: “Vāy mūṇru āṛu kōṭu mēl ai vēl”

Translation: “Harbor (vāy) - three (mūṇru) - river (āṛu) - fort (kōṭu) - high (mēl) - five (ai) - conquer (vēl).”

Interpretation: “Three river harbor fort high five conquer.”



M-296 a

M-296a

Conjoined twin Bull heads (back-to-back) sprouting sacred pipal tree with seven leaves above dotted offering stand (twin overseers guarding sacred perpetual growth)

Signs (right to left): 286 → 123 → 59 → 211 → 242

Ledger layer (practical receipt):

286: kūṭṭai-kāṭu-mēṛ-valai-cakkaram - residential compound with corner bastions and central wheel marker

123: onṛu - single-unit tally

59: mīṇ - fish cargo

211: tī-kāmbu - fire stick / beacon post / elevated signal marker.

242: kūṭṭai-mūṇṛu - three-bay warehouse marker

Read: Single-unit fish cargo destined for residential compound with corner bastions and central wheel, via weigh-station post to three-bay warehouse.

Rebus layer (first sounds only, right to left):

Glyphs: 286 → 123 → 59 → 211 → 242

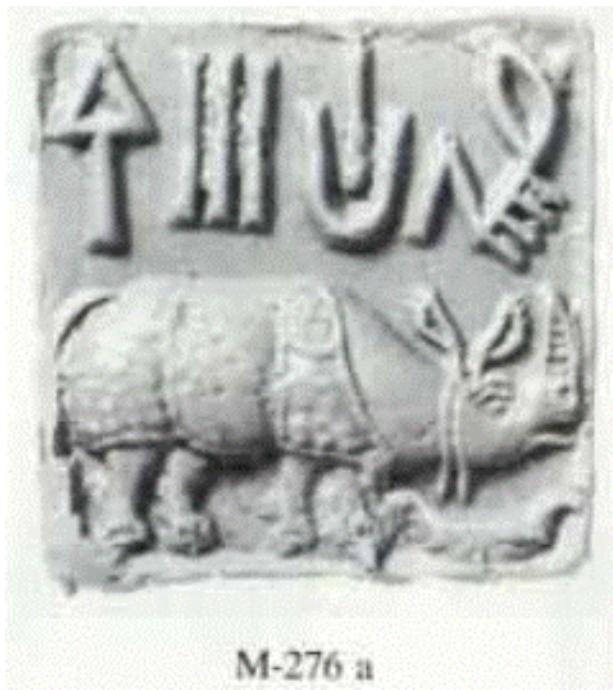
First sounds: kō (kōṭṭai) + o (onṛu) + me (meen) + tī (tī-kāmbu) + kū (kūṭṭai)

Phonetic chain: kō o me tī kū

Natural Old Tamil: “Kō on mīṇ tī kū”

Translation: King one fish fire inside

Interpretation: “The king's one fish-fire within”



M-276 a

M-276a

Right-facing rhino.

Signs (right to left): 48 → 336 → 89 → 211

Ledger layer (practical receipt):

48: āl-tūki-nālu - night-watch with bedding tally.

336: vāy-kūtu-oṇru-kil - harbor with maritime beacon post.

89: mūṇru - three-unit tally.

211: tī-kāmbu - fire stick / beacon post / elevated signal marker.

Read: Three-unit night-watch tally consignment destined for harbor with maritime beacon post, via guard post/checkpoint.

Rebus layer (first syllables only, head to tail):

Glyphs: 48 → 336 → 89 → 211

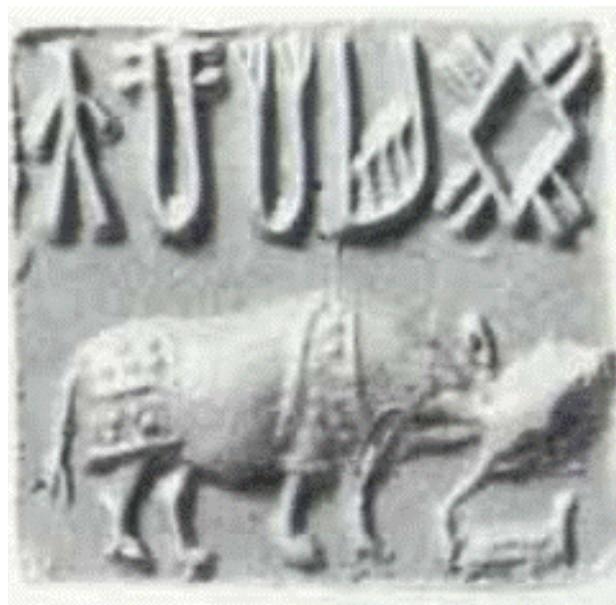
First syllables: āl → vā → mū → kā

Phonetic chain: āl vā mū kā

Natural Old Tamil: “Āl vā mū kā”

Translation: “Man/ruler (āl) - live/come (vā) - elder/ancestor (mū) - guard (kā).”

Interpretation: “The ruler lives guard the ancestor.”



M-275 a

M-275a

Right-facing rhino.

Signs (right to left): 264 → 341 → 347 → 342 → 1

Ledger layer (practical receipt):

264: kōṭai-kāṭu-mēr-tāl - residential compound with lower outlet marker.

341: kōṭ - curved blade / axe head.

347: vāy-mūṇru-kāṭu - harbor with left triple inlet and right four-canal outlet.

342: kōṭ-vāy - boat (canal/river/harbour/dock) Kōṭ Vāy/Mohenjo-Daro.

1: āl - person / clerk.

Read: Clerk or person consignment from residential compound with lower outlet, via axe head marker, destined for harbor with triple inlet and four-canal outlet, final destination notched harbor basin.

Rebus layer (first syllables only, head to tail):

Glyphs: 264 → 341 → 347 → 342 → 1

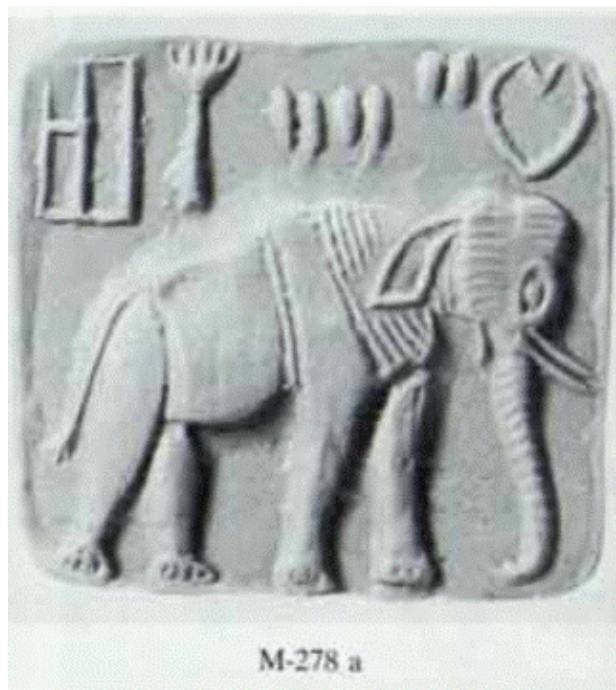
First syllables: kō → kō → vā → vā → āl

Phonetic chain: kō kō vā vā āl

Natural Old Tamil: “Kō kō vā vā āl”

Translation: “Fort (kōṭ) - king (kō) - live/come (vā) - live/come (vā) - man/ruler (āl).”

Interpretation: “Fort King live the ruler!”



M-278a

Right-facing elephant.

Signs (right to left): 267 → 99 → 104 → 171 → 242

Ledger layer (practical receipt):

267: kōṭṭai-kāṭu-mēṛ - residential compound with upper section.

99: mēl-iru - gateway marker (departure or destination modifier).

104: nālu - four-unit tally.

171: nālu-vēl - four-canal authority marker.

242: kōṭṭai-mūṇru - three-bay warehouse marker.

Read: Four-unit consignment departing from residential compound with upper section, via double gateway tally, allocated to four-canal authority, destined for three-bay warehouse.

Rebus layer (first syllables only, head to tail):

Glyphs: 267 → 99 → 104 → 171 → 242

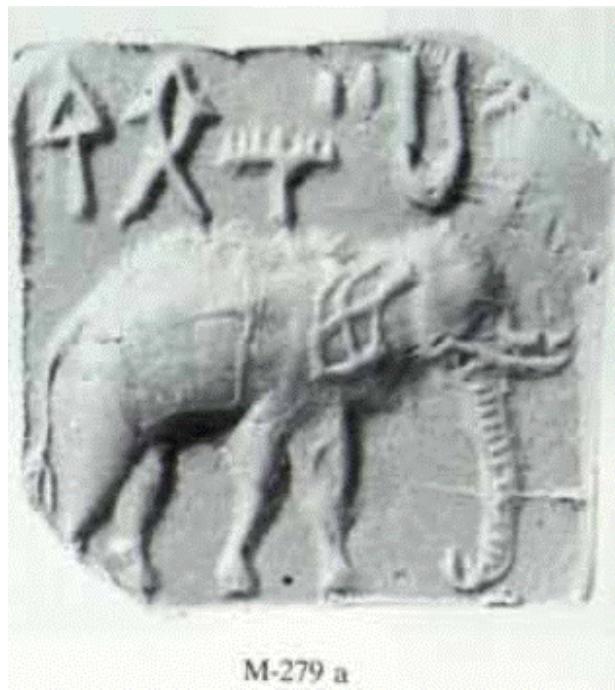
First syllables: kō → mēl → nā → vē → kō

Phonetic chain: kō mēl nā vē kō

Natural Old Tamil: “Kō mēl nāl vēl kō”

Translation: “King (kō) - high (mēl) - day/land (nāl) - conquer (vēl) - king (kō).”

Interpretation: “The King high land conquer King.”



M-279a

Right-facing elephant.

Signs (right to left): 328 → 99 → 171 → 59 → 211

Ledger layer (practical receipt):

328: vāy - U shape harbor marker.

99: mēl-iru - gateway marker (departure or destination modifier).

171: nālu-vēl - four-canal authority marker.

59: mī - standard fish cargo.

211: tī-kāmbu - fire stick / beacon post / elevated signal marker.

Read: Standard fish cargo departing from harbor, via double gateway tally and four-canal authority, to guard post/checkpoint.

Rebus layer (first syllables only, head to tail):

Glyphs: 328 → 99 → 171 → 59 → 211

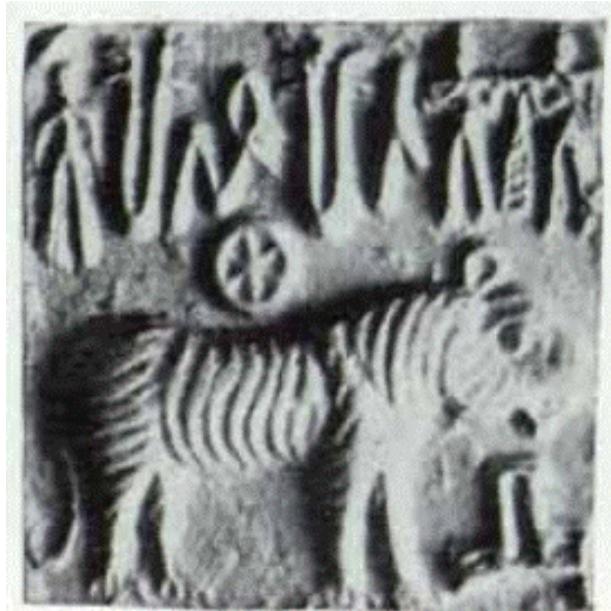
First syllables: vā → mēl → vē → mī → tī

Phonetic chain: vā mēl vē mī tī

Natural Old Tamil: “Vāy mēl vēl mī tī”

Translation: Harbor (vāy) - high (mēl) - conquer (vēl) - fish (mī) - fire (tī).

Interpretation: “high harbor conquer fish fire”



M-288 a

**M-288a**

Right-facing tiger.

Signs (right to left): 16 → 125 → 342 → 48 → 342 → 1

Ledger layer (practical receipt):

16: āl-kīl-tōl-mēri-vaļai - net-haul / fishermen.

125: mēl-pirivu - high-status marker (post-departure modifier).

342: kōt-vāy - boat (canal/river/harbour/dock) Kōt Vāy/Mohenjo-Daro.

48: āl-tūki-nālu - night-watch with bedding tally.

342: kōt-vāy - boat (canal/river/harbour/dock) Kōt Vāy/Mohenjo-Daro.

1: āl - person, man, ruler, guardian, subject (no major homophones, 'person who')

391: cakkaram - six-spoke circle - wheel symbol / traders' authority marker

Read: High-status clerk or person consignment from three-canal port authority, night tally, double destination notched harbor basin.

Rebus layer (first syllables only, head to tail):

Glyphs: 16 → 125 → 342 → 48 → 342 → 1

First syllables: vē → mē → vā → āl → vā → āl → ca

Phonetic chain: vē mē vā āl vā āl ca

Natural Old Tamil: “āl mēl vā āl vāy āl ca”

Translation: Man (āl) high (mēl) come (vā) man (āl) harbour (vāy) man (āl) wheel (ca)

Interpretation: “High man comes - man of the harbour, man of the wheel”



M-289 a

**M-289a**

Right-facing tiger.

Signs (right to left): 267 → 99 → 67 → 48 → 342

Ledger layer (practical receipt):

267: kōṭtai-kāṭu-mēṛ - residential compound with upper section.

99: mēl-iru - gateway marker (departure or destination modifier).

67: mīṇ-kaṭal - walking catfish cargo.

48: āl-tūki-nālu - night-watch with bedding tally.

342: kōṭ-vāy - boat (canal/river/harbour/dock) Kōṭ Vāy/Mohenjo-Daro.

Read: Walking catfish cargo departing from residential compound with upper section, via double gateway tally and night-watch tally, destined for notched harbor basin.

Rebus layer (first syllables only, head to tail):

Glyphs: 267 → 99 → 67 → 48 → 342

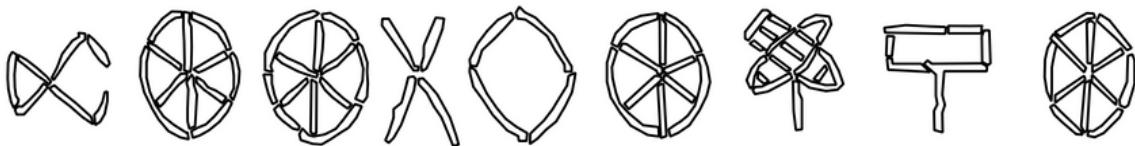
First syllables: kō → mēl → mī → āl → kō

Phonetic chain: kō mēl mī āl kō

Natural Old Tamil: “Kō mēl mī āl kō”

Translation: King (kō) high (mēl) fish (mī) man (āl) king (kō)

Interpretation: “High king, fish man king”



## The Dholavira Signboard

(The world's oldest known public inscription – over the northern citadel gate, c. 2500 BCE)

Signs (right to left): 391 → 256 → 327 → 391 → 373 → 137 → 391 → 391 → 216

Ledger layer (right to left flow):

391: cakkaram - six-spoke circle - wheel symbol / traders' authority marker

256: kālam-mēr-kīl - weigh-house post marker.

327: arasa-ilai-mēr - packaged peepal leaves /sacred leaf bundle.

391: cakkaram - wheel symbol / traders' authority marker

373: ūtu - fenced village marker.

137: kiram - crossroads marker.

391: cakkaram - wheel symbol / traders' authority marker

391: cakkaram - wheel symbol / traders' authority marker

216: korado - drag sled "1 load" symbol

Read: Under wheel authority, weighing post of sacred leaf bundle, wheel authority of village, crossroads wheel authority, wheel authority of loads.

Rebus layer (first sounds only, right to left):

First syllables: ca → kā → ar → ca → ū → ki → ca → ca → ko

Phonetic chain: ca kā ar ca ū ki ca ca ko

Natural Old Tamil: "Cakkā araca ūki cakkako"

Translation: Wheel (cakka) king (araca) raise/erect (ūki) wheel-king (cakkako)

Interpretation: "The wheel-king establishes the king" / "The king is raised by the wheel authority"

"Wheel authority raises the king – new cycle begins!"

"new cycle" because:

- "cakka" (wheel) is a classic symbol for cycle/turn/fortune in ancient Indian contexts (like the wheel of dharma or time).
- The double "cakka" (wheel at start and wheel-king at end) suggests a full loop or renewal.
- Raising/erecting something under wheel authority suggests "starting a new era/cycle of power or fortune".

*It was my opinion that the I next to the X was part of the X.*

*Actual pictures of the signboard discovery revealed that half of the X is missing and the I looks out of place, so i have translated it without the I*

## Conclusion

This study demonstrates that the Indus script is a dual-layer administrative trade ledger rooted in Proto-Dravidian, developed by the Mēl-Kōṭṭālar maritime network. Consistent patterns across hundreds of seals yield repeatable readings as cargo tallies, consignments, and route markers, with the same signs encoding concise rebus proclamations of authority and identity.

The etymological match between Mesopotamian 'Meluhha' and 'Mēl-Kōṭṭālar' ('high fort-builders'), shared numeral systems with Proto-cuneiform, and continuity in later South India collectively position the Indus civilization as a sophisticated maritime trade powerhouse deeply connected to early Dravidian culture.

The framework resolves key paradoxes of the script's brevity and repetition, substantially strengthens the Dravidian hypothesis, and redefines the script as a multifaceted tool for commerce and cultural proclamation. Core interpretations are robust, while provisional elements invite collaborative refinement and further interdisciplinary exploration.

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## NOTES:

### Methodological Considerations & Falsifiability

A primary objection to any pictorial decipherment is the cognitive bias of pareidolia, the tendency to perceive meaningful patterns in random visual data.

This research actively mitigates that risk through the following constraints:

**Systemic, Not Isolated Matches:** A sign is accepted as a topographic logogram only if it fits within a system of such signs, all adhering to a consistent orientational logic (e.g., northern alignment) or matches geological features of the time.

**Archaeological Priority:** Matches are made against excavated and surveyed architectural plans (e.g., the citadel of Mohenjo-daro) rather than speculative or modern landscapes.

**Contextual Validation:** The proposed logogram must function consistently in seal texts. A 'place-sign' should, for example, frequently occur in initial position (as an origin marker) or with specific sets of administrative signs.

The pareidolia hypothesis would predict accidental, inconsistent matches. This model predicts a coherent, recurring system. The fact that signs for major cities (Mohenjo-daro, Harappa, etc.) appear in distinct, repetitive administrative formulas confirms the latter.

### The Provisional Nature of Topographical Matches

This study presents geographic sign identifications with explicit confidence levels. A core group (e.g., the citadel of Mohenjo-daro) is supported by direct overlay with stable architecture. Others, based on paleo-channel maps or less-excavated features, are proposed as working hypotheses. These identifications are not the end of the process but the beginning. They generate testable archaeological predictions. For instance, Sign #235, proposed as the 'canal-dock of kot ālar,' predicts the existence of a major stone quay or canal terminal in the sector of Mohenjo-daro. Future excavation can confirm or refute this.

Crucially, the overall decipherment's syntactic and grammatical framework is derived from the core, high-confidence matches. The system is stable even if some individual provisional matches require future revision.

### Linguistic Assumptions and the Language-Agnostic Core

The first stage of this decipherment identifying place-logograms is language-agnostic. A schematic of a city means that city regardless of the spoken word for it.

For signs assigned phonetic values, I derive these values internally from the script's own rebus patterns, following the principle that a picture of a known thing can be used to represent the sound of its name. Only subsequently do we observe that these derived values form words and morphemes consistent with the Proto-Dravidian hypothesis, which is the prevailing linguistic model for the Indus region based on substrate analysis. This decipherment does not assume this family *a priori*; the fit emerges from the application of standard epigraphic principles.

If the underlying language were from a different family (e.g., Indo-Aryan or Munda), the geographic logograms and basic syntax would remain valid, but the specific phonetic readings and etymologies for non-logographic signs would require re-analysis. The core cartographic breakthrough stands independently.

### This model makes explicit, falsifiable claims:

It predicts that seals bearing a specific city-logogram will be found primarily in trade or administrative contexts linked to that city.

It predicts that unexcavated areas of Indus cities will contain features matching the schematics of proposed logograms (e.g., a tripartite structure at Site X if sign Y is claimed for it) or absence thereof. It predicts that any newly discovered seal inscription, when parsed through the resulting sign list and grammar, will yield a coherent, plausible text.

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