

Āyas in the Rigveda: Rethinking India's Metallurgical Origins

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ABSTRACT

This study presents a critical analysis of textual evidence from the Rigveda, demonstrating that it explicitly recognises only two metals: gold (*hiranya*, occasionally *rukma*) and *āyas*. The meaning of *āyas* has long been debated—variously interpreted as a generic term for "metal" or as referring to specific metals such as copper, bronze, gold, or iron. However, this study presents new internal textual evidence indicating that *āyas* in the Rigveda specifically referred to naturally occurring meteoric ironstone, sourced from iron meteorite debris, which is valued for being harder and stronger than stone yet malleable enough for hot-forging into tools and domestic objects. The recognition of only two metals of antiquity—gold and meteoric iron—in the Rigveda carries significant chronological implications. It suggests that the early stages of the Metal Age emerged during the Early Rigvedic Period, transitioning from the Late Neolithic Age. This challenges the conventional dating of the Rigveda to circa 1200 BCE in the context of the Iron Age.

Keywords: Rigveda, *āyas*, *ayaso dhārām*.

Introduction

UNESCO has officially recognised the Rigveda as the oldest known literary document in human history, underscoring its unparalleled significance as a cornerstone of the World Heritage. Comprising 10 books (*maṇḍalas*), 1,028 hymns (*sūktas*), and 10,522 verses (*rc*), the Rigveda stands as the most meticulously preserved oral text in the annals of civilisation. Its composition evolved over centuries, yet its transmission—faithfully preserved through an unbroken oral tradition—has maintained not only its linguistic and poetic structure but also its intricate phonetic precision and spiritual meaning.

Metals have played a transformative role in shaping the technological, economic, and cultural development of ancient civilisations. Their discovery and use marked pivotal milestones in human progress, influencing the production of tools, weaponry, ornamentation, trade, and ritual practices. Within this broader context, the Rigveda serves as an invaluable primary source for reconstructing early metallurgical knowledge in ancient India. Far from being a purely religious text, it contains embedded layers of symbolic, functional, and cosmological references to metals, making it a critical repository of early technological insight.

This study explores Rigvedic references to known metals of antiquity in order to reconstruct the early archaeometallurgical framework of the Vedic civilisation. By critically analysing selected verses, we aim to shed light on how these metals were perceived, valued, and possibly utilised during the Rigvedic period.

The complete Sanskrit text of the Rigveda, rendered in Devanagari script, is readily accessible via digital platforms such as the Wikisource Sanskrit Portal. For English translations, this study primarily draws upon

the works of Griffith, Wilson, and Jamison. However, we have also developed new interpretative translations that synthesise philological, symbolic, and metallurgical perspectives. These reinterpretations aim to reveal metallurgical knowledge embedded within the verses, while remaining faithful to both the literal meanings and the deeper symbolic layers of the original Sanskrit.

INTERNAL CHRONOLOGY FRAMEWORK OF RIGVEDA

Most scholars agree that Book 6 (*Maṇḍala 6*) is the oldest portion of the Rigveda, while Book 10 (*Maṇḍala 10*) is the most recent. This study follows the internal chronological model proposed by Talageri, which organises the Rigveda's ten books into three broad temporal phases based on linguistic, thematic, and genealogical evidence:

The internal chronological framework outlined above is employed in this study as a guiding analytical tool to trace the evolution of metallurgical references and symbolism across the three organically connected phases of the Rigvedic period. By mapping the occurrences and contexts of key references to metals across these layers, we aim to reconstruct the development of early metallurgical knowledge within Vedic society.

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Early Rigvedic Period	Middle Rigvedic Period	Late Rigvedic Period
Early Family Book (in chronological order)	Middle Family Books	Late Family and Non-Family Books
<ul style="list-style-type: none"> Maṇḍala 6 Maṇḍala 3 Maṇḍala 7 The early part of Maṇḍala 1 	<ul style="list-style-type: none"> Maṇḍala 4 Maṇḍala 2 The mid part of Maṇḍala 1 	<ul style="list-style-type: none"> Maṇḍala 5 Maṇḍala 8 Maṇḍala 9 Maṇḍala 10 The late part of Maṇḍala 1

METALS OF ANTIQUITY KNOWN IN THE RIGVEDA

The Rigveda explicitly references only two metals that were known in antiquity. The first is gold, predominantly referred to as *hiranya* and occasionally as *rukma*. The second is *āyas*, a term whose precise meaning in the Rigvedic context remains the subject of ongoing scholarly debate.

Although many scholars have interpreted *āyas* as a generic term for "metal"—or more specifically as copper, bronze, gold, or smelted iron—these interpretations may not accurately reflect the Rigvedic worldview. Instead, contextual evidence suggests that the term *āyas* referred to a strong, lustrous, and durable material, well-suited for crafting sharp tools and robust weaponry.

The Rigvedic people recognised *āyas* as a symbol of strength and resilience. It was often used metaphorically to describe divine power—manifested in the hands, jaws, and feet of horses, in the beaks of birds, and the fortified structures associated with gods. These symbolic uses highlight both the functional value and the cosmological resonance of *āyas* within Vedic thought.

Compared to gold, references to *āyas* are fewer in number but rich in symbolic and technological significance. This study has identified and analysed forty (40) explicit references to *āyas* across various hymns and contexts in the Rigveda, as listed below:

Early Rigvedic Period			Middle Rigvedic Period				Late Rigvedic Period		
Book 6	Book 3	Book 7	Book 4	Book 2	Book 5	Book 8	Book 9	Book 10	Book 1
6.3.5		7.3.7	4.2.17	2.20.8	5.30.15	8.29.3	9.1.2	10.87.2	1.52.8
6.47.10		7.15.14	4.27.1		5.62.7	8.101.3	9.63.3	10.96.3	1.56.3
6.53.5		7.18.17	4.37.4		5.62.8		9.63.4	10.96.4	1.57.3
6.71.4		7.95.1	4.37.5				9.80.2	10.99.6	1.58.8
6.75.15							9.112.2	10.99.8	1.80.12
								10.101.8	1.88.5
								10.113.5	1.116.15
									1.129.9
									1.163.9

The term *āyas*, particularly as used in the Rigveda, has long intrigued scholars and occupies a contested yet critical space in Vedic studies. Its precise meaning is pivotal for tracing the developmental trajectory of ancient Indian metallurgy. A nuanced understanding of

āyas in the Rigvedic context is not only essential for reconstructing the metallurgical knowledge of the Vedic Civilisation but also has far-reaching implications for the chronological placement of the Rigveda itself—thereby reshaping our broader understanding of early Indian history.

UNRAVELING THE MEANING OF "ĀYAS" IN THE RIGVEDA

Despite its frequent occurrence in the Rigveda, interpretations of *āyas* have varied widely—from a generic reference to metal to copper or bronze or smelted iron or even to gold. Deciphering the true meaning of "*āyas*" in the Rigveda is not merely an academic pursuit but a key to unlocking the secrets of the archaeometallurgy of ancient India during the earliest layer of the Vedic Civilization.

Scholars have proposed a wide range of interpretations for the meaning of *āyas* in the Rigveda, as outlined below:

Mcdonell (1900), a noted Sanskrit scholar, argues that *āyas* in the Rigveda refer to bronze or copper rather than iron. He states:

"The Metal most often referred to in the Rigveda next to gold is called *ayas* (Latin, *aes*). It is a matter of no slight historical interest to decide whether this signifies "iron" or not. In most passages where it occurs, the word appears to mean simply "metal." In the few cases where it designates a particular metal, the evidence is not very conclusive, but the inference which may be drawn as to its colour is decidedly in favour of its having been reddish, which points to bronze and not iron. The Atharvaveda distinguishes between "dark" *ayas* and "red" *ayas*, indicating that the distinction between iron and copper, or bronze, had only recently been drawn. It is, moreover, well known that in the progress of civilisation, the use of bronze always precedes that of iron. Yet it would be rash to assert that iron was altogether unknown even to the earlier Vedic age."

Max Müller (1912), a renowned scholar, philologist, and orientalist in the late nineteenth century, discussed the meaning of *ayas* in Appendix V of his collected works, Volume 10. He states as follows

"The Sanskrit *ayas* means certainly iron in the later periods of literature, but there is no passage in the most ancient hymns of Rig-Veda where it must mean iron."⁵

He further states,

"All, therefore, we are justified in stating positively is, that at the time of Rig-Veda, besides silver or gold, a third metal was known and named *ayas*; but whether that name referred to copper or iron, or metal in general, there is no evidence to show."⁵

Chakrabarti (1992), an eminent professor of South Asian Archaeology, states that the meaning of *ayas* depends on its context. His views are as follows:

"It should be clear that any controversy regarding the meaning of *ayas* in the R̥gveda or the problem of the R̥gvedic familiarity or unfamiliarity with iron is pointless. There is no positive evidence either way. It can mean both copper-bronze and iron and, strictly based on the contexts; there is no reason to choose between the two."

Biswas (1996), a renowned professor in metallurgy, was of the view that the word *ayas* means metal, probably denotes copper or copper alloys, and he states:

"The word *āyas* in the R̥gveda (1.57.3, 1.163.9, 4.2.17, 6.3.5.10.53.9-10, etc.) means metal in general, not iron in particular. In the Vedic age, it probably corresponded to copper and its alloys. In Vedic literature, copper was mentioned as red metal and iron as black metal. This also proves that *āyas* in the R̥gveda could not mean "iron."

Witzel (2001), an eminent professor at Harvard University, states that while the term *āyas* in the Rigveda refers to copper or bronze, the terms *kārṣṇāyasa* and *śyāmāyas* in Late Vedic Literature refer to iron. He states

"For, the first appearance of iron, the 'black metal' (kRSNa/zyAma *ayas*) in S. Asia, well known to the Brāhmaṇa style texts, is only at c. 1200 BCE (Chakrabarti 1979, 1992, Rau 1974, 1983, cf. now, however, Possehl-Gullapalli who point to 1000 BCE). But iron is already found in texts much earlier than the Brāhmaṇas (i.e. AV, and in the YV saMhitAs MS, KS, TS; however, not yet in the RV). This fact is frequently misunderstood by historians and archaeologists, who often quote older RV translations that render *ayas* as 'iron' when it actually means 'copper' or, possibly, also 'bronze' (Rau 1974, 1983). often in opposition to the 'black metal.'"

He further states

"The meaning of *ayas* is frequently misunderstood by historians and archaeologists who simply quote the older Rigvedic translations that render *ayas* by 'iron' while it means 'copper' or maybe, also 'bronze' (Rau 1974, 1983)."

The most widely accepted interpretation of *āyas* in the Rigveda—as a generic term encompassing metals such as copper, bronze, gold, or smelted iron—has long posed a scholarly puzzle with significant chronological implications. The prevailing interpretations, along with their supporting and opposing arguments, are examined in detail below.

Was “Āyas” a Generic Term for Metal in the Rigveda?

A widely accepted scholarly view holds that *āyas* in the Rigveda functioned as a generic term for "metal." This interpretation largely stems from the appearance of

compound terms in later Vedic texts, such as *kārṣṇāyasa* ("black metal") and *lohītāyas* ("red metal"), which are typically associated with iron and copper, respectively. On this basis, scholars have inferred that in the Rigvedic strata, *āyas* functioned as a broad, undifferentiated term for metal, with qualifying adjectives introduced gradually to denote specific types of metal. This view reflects a retrospective linguistic model that projects later metallurgical classifications onto the earlier, more poetic and cosmological language of the Rigveda.

However, a closer examination of the Vedic corpus challenges this assumption. Even in the Late Vedic period, *āyas* remained the principal term for iron, appearing more frequently than its adjectival compounds. Notably, *kārṣṇāyasa* is more plausibly interpreted as 'black stone'—referring to the darker variety of meteoric ironstone—rather than 'black metal,' a term typically associated with smelted iron from the Iron Age, around 1200 BCE.

Vedic and early epic literature show remarkable consistency in metal terminology, with *āyas* uniquely used without reference to other metals. Gold is always *hiranya* or *rukma*, silver is *rajata*, lead is *sīsam*, and tin is *trapu*—none are prefixed with *āyas*. This undermines the notion that *āyas* functioned as a generic term. Moreover, truly generic terms for metals, such as *dhātu*, appear only in post-Vedic texts, suggesting that the Rigvedic worldview recognised metals only individually by distinct names.

In the Rigveda, only two metals are explicitly and consistently referenced: *hiranya* (gold), linked to ornamentation and ritual, and *āyas*, associated with strength, tools, and weapons—pointing to its specific identity as meteoric iron. Later compound terms, such as *kārṣṇāyasa* and *śyāmāyasa*, reflect differentiation within this category rather than a shift in core meaning.

In sum, the interpretation of *āyas* as a generic "metal" lacks linguistic, textual, and archaeological evidence. Instead, the textual evidence reveals semantic continuity: *āyas* retained a specific and enduring meaning as meteoric iron.

Did “Āyas” Refer to Copper or Bronze in the Rigveda?

The second assumption is that *āyas* in the Rigveda denote copper or bronze. This interpretation stems from the broader archaeological framework in which the "Chalcolithic" or "Copper Age" is seen as preceding the Iron Age in ancient civilisations. Some scholars have further linked *āyas* to reddish metals based on Rigvedic imagery of flame-colored or sun-hued objects.

assumption. The Rigveda and even the broader Late Vedic corpus contain no mention of iron ore, furnaces capable of smelting, slag, or any other indicators of iron metallurgy. Thus, identifying *āyas* as smelted iron is inconsistent with both literary and archaeological records. A more plausible interpretation is that *āyas* referred to meteoric iron, which naturally occurs in a stony form but is metallic and exceptionally hard. Its celestial origin and dramatic descent would have imbued it with both symbolic and technological significance in Vedic thought.

In summary, prevailing identifications of *āyas*—as a generic term for "metal," or specifically as copper, bronze, gold, or smelted iron—do not withstand scrutiny when evaluated against the internal logic and terminology of Vedic texts. Across both Rigvedic and Late Vedic sources, *āyas* is consistently linked with cosmological symbolism and properties such as strength, durability, and sharpness of its edge — qualities that best match meteoric iron.

That said, our discussion so far has focused on what *āyas* is not. We must now turn to the more critical question: what does *āyas* truly mean within the Rigvedic worldview?

DECODING THE TRUE MEANING OF ĀYAS IN THE RIGVEDA

Although the Rigveda offers no explicit definition of *āyas*—a limitation rightly acknowledged by Max Müller—this absence does not preclude a careful, context-sensitive analysis grounded in internal textual evidence. Two key verses—RV6.3.5 and RV6.47.10, both from Maṇḍala 6, among the oldest and most archaic layers of the Rigvedic corpus—contain the phrase *āyaso dhārām* ("stream of *āyas*"), which serves as a critical internal clue to its true meaning.

These two verses invite a re-evaluation of *āyas* not as a terrestrial metal but as a term embedded within a broader cosmological and poetic framework. A close reading suggests that *āyaso dhārām*, in these contexts, alludes to a cosmic phenomenon—possibly a meteor shower of iron-rich celestial fragments. This interpretation aligns with the Rigvedic tradition, where natural and astronomical events are often encoded in symbolic, ritualistic, and poetic language with remarkable internal coherence.

Traditional translators such as Wilson, Griffith, and Jamison have rendered *āyaso dhārām* as "the point" or "edge" of sharpened metal—often interpreted as a weapon—emphasising martial or ritual power. However, an alternative and compelling interpretation was first suggested by Neogi (1914), drawing upon Sāyaṇa's classical commentary. He rendered *āyaso dhārām* as a "shower of iron swords and javelins." While this may

initially seem like poetic exaggeration, modern scientific knowledge gives this metaphor unexpected depth.

Reconsidered through the lens of celestial phenomena, this phrase may, in fact, describe a meteor shower—fiery streaks of iron-rich meteoric fragments falling from the sky. This interpretive framework, *āyas*, is not terrestrial metal but meteoric iron—a naturally metallic, extraterrestrial substance known for its hardness, durability, and symbolic potency. The imagery of *āyaso dhārām* blends both empirical observation and cosmological imagination, fusing poetic metaphor with proto-scientific insight. These verses provide strong internal evidence that, in the earliest strata of the Rigveda, *āyas* most plausibly refers to meteoric ironstone of celestial origin.

Reinterpreting RV6.3.5: Agni as the Orchestrator of a Meteoric Descent

Building on the internal clues discussed above, the Rigveda verse RV 6.3.5 provides a key example where the term *āyaso dhārām* invites reinterpretation. Below, we present the verse alongside its traditional literal translations and a new interpretative translation that reconsiders *āyaso dhārām* not as a terrestrial weapon, but as a vivid poetic description of an iron meteorite shower:

Rigveda's First Clue to the Meaning of Āyas

æ {Ø≠€≤[Ŷ̂ ∞ØæDΣSÖŠ ° ≠ ≠€ŷΣæú± ∞d]P̂ |

sa idasteva prati dhādasīṣyañchīśīta tejo. āyaso na dhārām

Ἔ Τ τ • Ṽ Π Π̂ Σ̂ Δ̂ Á ≠ ṽ Ḥ XZQ̂ ρ [Ŷ̂ Ɛ̂ ∼ ∂ • ḃ̂ Ē̂ || RV6.3.5

citradhrajaratiratyō aktorverna drusadvā raghupatmajamhāh

Word to word breakdown:

æĒ] {≠ ŷ] y ḃ≠ġ {^] ū Ŷ̂] ∞p̂ ŷ] y æĒΣ± ŷ] Ḷ̂ ° ≠] ≠€Ē] y ΣæĒ] ±]

∞p̂ [P̂ ŷ] ŷ Tj t • Ṽ Ē̂] y [Ŷ̂ Ē̂] ΣĒ̂] y Á ≠ [Ē̂] ^ Ē̂] ±] T̂ ĵ æφ̂ ρ]

Π̂ Ɛ̂ ∼ ∂ j • ḃ̂ Ē̂ ^

sah | it | astāiva | prati | dhāt | asiṣyan | śīśīta | tejah | ayasaḥ | na | dhārām | citra-dhrajatiḥ | aratiḥ | yah | aktoḥ | veḥ | na | dru-sadvā | raghupatma-jamhāh

Ralph T.H. Griffith's Translation

"Archer-like, fain to shoot, he sets his arrow and whets his splendour like the edge of iron: The messenger of night with brilliant pathway, like a tree-roosting bird of rapid pinion."

H.H. Wilson's Translation:

"He casts (a far his flames) as an archer (his arrows) and sharpens when about to dart his radiance, as (a warrior whets) the edge of his metal (weapons), he who, variously moving, passes through the night, like the light-falling foot of a bird perched upon a tree."

Jamison - Brereton's Translation:

"He, just like an archer, has aimed (his arrow) and is about to shoot. He has whetted its point like a blade of copper— he, the spoked wheel (of the sacrifice), who is like a bird whose swooping is brilliant by night, who sits in the woods [on wood], whose plumage is (fit for) rapid flight."

New Interpretative Translation:

In his corporeal form, Agni orchestrates a brilliant celestial display across the sky (sah it astāiva prati dhāt śīśīta). He casts down radiant streams of iron meteors from the heavens (tejah ayasaḥ na dhārām), illuminating the darkness with their fiery trails (citra-adhrajatiḥ aratiḥ aktoḥ). This awe-inspiring cosmic event resembles the swift descent of a bird (veḥ), gracefully alighting (yah raghupatma-jamhāh) upon the sturdy branch of a tree (dru-sad vā).

Rigveda Verse RV 6.3.5: A Comparative Analysis of Traditional and New Interpretations

Traditional translations of the Rigveda, specifically RV6.3.5, by Griffith, Wilson, and Jamison, when examined alongside a new cosmological interpretation, reveal significant differences in metaphorical coherence and thematic unity. The verse's imagery—traditionally understood as martial or natural—is reinterpreted here as a poetic representation of a celestial event, likely a meteor shower. The following table highlights key phrases and the contrasting interpretive approaches:

Key Imagery	Griffith	Wilson	Jamison	New Interpretation
Archer Metaphor	"An archer setting an arrow"	"An archer casting arrows"	"An archer aiming an arrow"	Agni orchestrates a cosmic discharge, not literal archery
Sharpening/ Brilliance	"Whets his	"Sharpen s (whets)	"Whets its point like	Radiant streaks of ayas (iron)

	brilliance like iron"	metal weapons"	a blade of copper."	meteors) descending.
Motion in Darkness	"A brilliant path at night"	"Passes through the night"	"A bird swooping at night"	Illuminates the night sky with celestial brilliance
Bird Metaphor	"Like a bird settling on a tree"	"Light-footed bird landing"	"Bird plunging swiftly"	Swift descent of a radiant celestial object (meteor)

Traditional interpretations of Rigveda RV6.3.5 rely on three distinct metaphors—archer, whetted blade, and bird in motion—that often appear fragmented and thematically disjointed. For example, the bird's downward flight contrasts with Agni's upward-surgng terrestrial flame, creating conceptual tension. Such readings risk obscuring the hymn's central motif: the exaltation of Agni as the cosmic orchestrator of a dramatic celestial event.

In contrast, the revised interpretation offers a unified cosmological reading. Agni is not merely terrestrial fire but the divine force directing a meteoric descent, encapsulated in the phrase *tejah āyaso dhārām*—"radiant streams of meteoric iron." This imagery, traditionally understood as ritual weaponry, is more coherently viewed as describing fiery iron meteors streaking across the sky.

The phrase *citra-adhrajatiḥ aratiḥ aktoḥ* is thus reinterpreted as the vivid trajectory of a meteor blazing through the night. The embedded bird metaphor (*veḥ*) enhances this reading: the meteor's swift, radiant plunge mirrors a celestial bird in elegant descent, its glowing plume trailing like wings across the dark sky.

This interpretation harmonises the verse's layered metaphors—archer, blade, and bird—into a single symbolic tableau: fiery meteors, as birds, arc downward with brilliance, force and impact on Earth. In Rigvedic vision, such imagery encodes not only poetic beauty but cosmological insight. The meteor becomes Agni himself—divine fire descending with purpose and radiance.

The accompanying visual seeks to evoke this moment of cosmic drama, where natural spectacle and sacred symbolism converge. Through such hymns, the Vedic poets preserved a sophisticated worldview that celebrated celestial phenomena within a sacred, mythic frame—affirming their keen observational acuity and poetic brilliance.

A Spectacular Sky Scene of Meteor Shower (*āyaso dhārām*)



(*citrādhrajatīratīryo aktorverna druṣadvā raghupatmajanāh*)
Bright iron meteors streak across the sky, descending to Earth and leaving luminous trails that illuminate the dark expanse. This cosmic meteor shower was as mesmerizing as a bird gracefully landing on a tree branch.

In sum, the new interpretation offers a linguistically precise and metaphorically cohesive reading of RV 6.3.5. It redefines *āyas* not as a terrestrial metal like copper or bronze, but as meteoric iron—celestial in origin and intimately linked to Agni's divine agency. This cosmological framing not only deepens our appreciation of the verse's symbolic richness but also offers compelling internal evidence for reinterpreting *āyas* across the Rigvedic corpus as meteoric ironstone—rather than the varied and often conflicting identifications as a generic metal, copper, bronze, or even gold.

Rigveda Verse RV 6.47.10: A New Cosmological Interpretation

Extending the cosmological lens applied to RV 6.3.5, Rigveda 6.47.10 emerges as a thematically resonant companion. In this verse, Indra Devatā is invoked as the divine protector against a looming celestial threat—*āyaso dhārām*, the 'stream of *āyas*'—reinterpreted here, as in RV 6.3.5, as a vivid allusion to a meteor shower. Rather than a generic plea for protection from weapons, the verse likely encodes a call for defence against the fiery descent of meteoric iron. This reading deepens the verse's symbolic resonance and aligns it with the celestial imagery of RV 6.3.5, where Agni orchestrates a cosmic event of *āyaso dhārām*. Below, we present a comparison between traditional interpretations and a new reading that frames *āyaso dhārām* as a poetic depiction of a meteor storm threatening terrestrial life.

Rigveda's Second Clue to the Meaning of *Āyas*

इन्द्र मर्ळ मह्यं जीवातुमिच्छ चोदयधियमयसो न धाराम ।

indra mṛṣa mahyam jīvātumiccha codaya dhiyam āyaso na dhārām

यत् किं चाहं तवायुरिदं वदामि तज्जुषस्व कर्धि मा देववन्तम् ॥ RV6.47.10

yat kiṃ cāhaṃ tvāyuridaṃ vadāmi tajuṣasva kṛdhi mā devavantam

Word to word breakdown:

इन्द्र । मर्ळ । मह्यम् । जीवातुम् । इच्छ । चोदय । धियम् । अयसः । न । धाराम् । यत् । किम् । च । अहम् । त्वाऽयुः । इदम् । वदामि । तत् । जुषस्व । कर्धि । मा । देवऽवन्तम् ॥

indra | mṛṣa | mahyam | jīvātum | iccha | codaya | dhiyam | ayasaḥ | na | dhārām | yat | kim | ca | aham | tvāyuh | idam | vadāmi | tat | juṣasva | kṛdhi | mā | deva-vantam

Ralph T.H. Griffith's Translation:

Be gracious, Indra, let my days be lengthened: sharpen my thought as 'twere a blade of iron.

Approve whatever words I speak, dependent on thee, and grant me thy divine protection.

H. H. Wilson's Translation:

Make me happy, Indra; be pleased to prolong my life; sharpen my intellect like the edge of a metal sword whatsoever, desirous (of propitiating) you, I may utter, be pleased by it; render me the object of divine protection.

Jamison -Breton's Translation:

Indra, be gracious. Seek a means of life for me. Spur on my poetic vision like a blade of copper. Whatever I say here in devotion to you, just this enjoy. Make me accompanied by the gods.⁵

New Interpretative Translation:

O Indra, may your grace (*mṛṣa*) shine upon me and awaken my intellect (*codayā dhiyam*). I earnestly implore (*iccha*) you to protect my life (*mahyam jīvātum*) from the descending stream of iron meteors (*āyasaḥ na dhārām*) that may fall from the sky. May you accept (*juṣasva*) the words I now offer you in prayer (*yat kim ca aham tvāyuh idam*), and may they bring you delight.

Rigveda 6.47.10 is a solemn invocation to Indra Devatā, seeking protection from a dramatic celestial threat from the cosmic phenomenon described as *āyaso dhārām*. Traditional translators—Griffith, Wilson, and Jamison—have rendered this phrase metaphorically, interpreting it as 'sharpened intellect,' 'refined speech,' or a 'whetted blade.' While the association of *āyas* with sharpness lends some plausibility to metaphors like 'whetted blade' or 'sharpened brilliance,' extending its meaning to 'refined speech' or 'intellectual acumen' lacks firm support in the Vedic lexicon and ritual context. These metaphorical readings, while elegant, ultimately obscure the phrase's apparent cosmological dimension—as a plea for divine intervention against a looming celestial threat.

More critically, such interpretations fail to align with the broader celestial framework evident in both RV6.47.10 and RV 6.3.5—each of which features the phrase *āyaso dhārām*. The disjointed application of metaphor across these verses weakens the internal coherence of traditional exegesis and risks eclipsing the underlying cosmological vision encoded in the text.

By contrast, the present interpretation preserves both the semantic integrity and thematic continuity of the phrase by reading *āyaso dhārām* as a literal and visually

evocative reference to a meteor shower composed of iron-rich celestial fragments. Within this framework, RV6.3.5 portrays Agni not merely as terrestrial fire, but as a cosmic force orchestrating the radiant descent of fiery metallic streams—closely resembling the spectacle of a meteor storm. RV6.47.10, in turn, casts Indra—the thunderbolt-wielding storm deity—as the divine protector invoked to shield the world from the destructive force of such a celestial onslaught.

This interpretive pairing unveils a profound cosmological duality within the Rigvedic imagination: Agni embodies the generative force that unleashes celestial energies and initiates transformation, while Indra represents the restraining power that safeguards terrestrial life from their excess. Together, they form a vision of cosmic equilibrium—where the radiant violence of the heavens is tempered by divine guardianship, preserving harmony between the celestial and the earthly realms.

Tracing “Āyas” to “Aśman”: A Linguistic Case for

Meteoric ironstones (āyas) for Fortifications

(Ralph T. H. Griffith's Translation)

व्रजं कृणुध्वं स हि वो नृपाणो वर्म सीव्यध्वं बहुला पृथूनि ।

vrajaṃ kṛṇudhvaṃ sa hi vo nṛpāṇo arma sīvyadhvaṃ bahulā pṛthūni

पुरः कृणुध्वमायसीरधृष्टा मा वः सुस्रोच्चमसो दंहता तम् ॥ RV10.101.8
purah kṛṇudhvaṃ āyasīr adhrṣṭā mā vaḥ susroc camaso dṛṃhatā tam

"Prepare the cow stall, for there drink your heroes: stitch ye the coats of armour, wide and many. Make iron forts secure from all assailants; let not your pitcher leak: stay it securely."

Celestial Ironstone

The term *āyas* appears to share an etymological affinity with *aśman*, a word in Vedic Sanskrit that carries the dual meanings of 'stone' and 'sky.' This linguistic overlap suggests that *āyas* may have originally signified 'sky-stone,' a concept that aligns closely with meteoric ironstone. If linguistic scholars acknowledge this relationship between *āyas* and *aśman*, it would further strengthen the interpretation that *āyas* in the Rigveda refers not to terrestrial copper or bronze, but to meteoric iron—iron of celestial origin.

Meteoric iron, often encased in stony meteorites, would have been the earliest naturally occurring and workable form of iron accessible to ancient civilisations—predating the advent of iron smelting technologies by centuries, if not millennia. In this context, Rigvedic verses such as RV 6.3.5 and RV 6.47.10, which depict dramatic celestial events involving showers of *āyas*, lend strong support to the interpretation that this term referred to

meteoritic ironstone—perceived as a stony metal that descended from the heavens.

This reading resonates with how many ancient cultures regarded meteoric iron: as a divine or supernatural substance associated with gods, omens, and cosmic forces. Recognising the probable linguistic and contextual link between *āyas* and *aśman* further strengthens the argument that *āyas* in the Rigvedic period referred specifically to meteoric ironstone, rather than to more familiar terrestrial metals like copper or bronze. These verses thus provide compelling internal evidence that *āyas* originally—and meaningfully—denoted a metal of celestial origin.

“Āyas” as a Protective Material in Rigvedic Architecture

When the Rigvedic people first encountered celestial stones, they revered them for their radiant lustre, exceptional hardness, and mysterious heavenly origin. These luminous substances with metallic sheen—*āyas*—were initially imagined as the very material from which the divine dwellings of the gods were fashioned. Over time, this sacred symbolism found practical expression, as communities began incorporating naturally occurring fragments of meteoric ironstone into the construction of their own protective structures and dwellings.

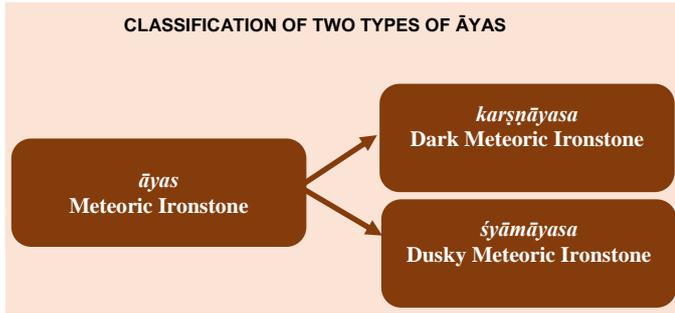
A key textual reference appears in RV10.101.8, where priests conducting the Soma sacrifice are instructed to use *āyas* specifically in the construction of cow stalls and protective barriers. This practical directive provides strong evidence that *āyas* was understood not as a smelted metal but as a naturally occurring, durable material—consistent with the properties of meteoric ironstone. Such usage reinforces the interpretation that *āyas* in the Rigveda referred to iron of celestial origin, rather than to terrestrial metals like copper or bronze.

Rigveda verse, RV10.101.8, referring to the use of *āyas* in early fortifications, aligns seamlessly with the natural characteristics of meteoric ironstone—durable, resilient, and typically found in solid, usable fragments. Its incorporation into construction not only highlights its functional strength but also underscores its sacred status. As a material of celestial origin, revered and mythologised by the Rigvedic people, *āyas* was valued both for its divine symbolism and its tangible, stony form.

Thus, the cumulative evidence from three key Rigvedic verses—RV6.3.5, RV6.47.10, and RV 10.101.8—along with the plausible etymological link between *āyas* and *aśman* (a word denoting both "stone" and "sky"), strongly supports the interpretation of *āyas* in the Rigveda as meteoric ironstone. In RV6.3.5, Agni is depicted as orchestrating a cosmic phenomenon involving the fiery descent of iron-bearing meteors. In RV6.47.10,

Indra is invoked for protection against such celestial threats, reinforcing the perception of āyas as a potentially hazardous force from the sky. RV 10.101.8 further affirms that āyas existed in a stony form and were employed in construction, particularly in the building of fortifications. Taken together, these verses present a coherent and specific interpretation of āyas as meteoric ironstone—emphasising its iron content, celestial origin, and naturally solid, stony character.

While later metallurgical traditions broadened the semantic range of āyas, its original meaning persisted. By the Late Vedic period, āyas continued to denote iron and had evolved into two distinct classifications: *kārṣṇāyasa* (dark-coloured iron) and *śyāmā* or *śyāmāyasa* (dusky or less dark iron), as shown below:



This differentiation—possibly the earliest known attempt in human history to classify types of meteoric iron—maintains both conceptual and linguistic continuity with the Rigvedic usage of āyas, rooted in its celestial and elemental origins.

Vālmīki Rāmāyaṇa Affirms Āyas as Meteoric Ironstone

The post-Vedic text, the Vālmīki Rāmāyaṇa, offers compelling textual evidence supporting the identification of āyas as meteoric ironstone. In verse VR 4.41.13, a prosperous mining region is described as being strewn with unusual, strange ironstones (*āyas*), marked by oval-shaped depressions (*ayomukhaḥi*)—a striking reference to **regmaglypts**, the oval-shaped surface depressions that are diagnostic of meteorites in modern science.

Evidence of Meteoric Ironstone Deposits on Mount Malaya in the Vālmīki Rāmāyaṇa

अयोमुखः च गंतव्यः पर्वतो धातु मण्डितः |
ayomukhaḥ ca gaṃtavyaḥ parvato dhātu maṇḍitaḥ
 विचित्र शिखरः श्रीमान् चित्र पुष्पित काननः || VR4.41.13
vicitra śikharaḥ śrīmān citra puṣpita kānanaḥ
 सुचंदन वनोद्देशो मार्गितव्यो महागिरिः||
sucandanavanoddeśo mārgitavyo mahāgiriḥ

Context: The verse VR 4.41.13 occurs when King Sugrīva directs the Vānara-s to conduct their search for Sītā on Mount Malaya—a prosperous and sacred mountain situated in the southern region of Jambūdvīpa.

Interpretative Translation:

Go to the great mountain Malaya (*mahāgiriḥ*), whose slopes are fragrant with groves of fine sandalwood (*sucandana-vanoddeśaḥ*). Its peaks rise in wondrous and unusual forms (*vicitra-śikharaḥ*), and its forests are adorned with vividly blooming flowers (*citra-puṣpita-kānanaḥ*). This majestic and prosperous mountain (*śrīmān*) is to be sought out (*mārgitavyaḥ*), for it is rich in hidden mineral wealth (*dhātu-maṇḍitaḥ*), including strange ironstones bearing curious, mouth-like oval depressions (*ayomukhaḥ*)

Footnote: The term *ayomukhaḥ* refers to the distinctive features of meteoric iron meteorite fragments, characterised by mouth-like oval depressions, scientifically known as regmaglypts. An image of Iron meteorite fragments with regmaglypts from Sikhote-Alin is shown below:



Additionally, verse VR 3.22.10 describes a forged sword whose polished surface bears intricate, visible patterns (*citrān*), consistent with what is today known as the **Widmanstätten structure**—a crystalline pattern unique to polished sections of meteoric iron. These vivid and scientifically accurate descriptions reinforce the interpretation that āyas, as understood in both the Rigvedic and post-Vedic periods, referred not to smelted terrestrial metals like copper or bronze but to naturally occurring meteoric ironstone of celestial origin.

Additional Evidence of Swords made of Meteoric iron in the Vālmīki Rāmāyaṇa

उपस्थापय मे क्षिप्रम् रथम् सौम्य धनुषि च |
upasthāpaya me kṣipram ratham saumya dhanuṣi ca
 शरान् च चित्रान् खड्गां च शक्ती च विविधाः शिताः
 || VR3.22.10
śarān ca citrān khadgāṃ ca śakti ca vividhāḥ śitāḥ

Context: The verse VR 3.22.10 occurs when King Khara, enraged by Rāma's actions, commands his commander-in-chief, Dūṣaṇa, to swiftly prepare his war chariot along with a formidable arsenal of weapons. The moment marks the beginning of Khara's direct military confrontation with Rāma in the Daṇḍakāraṇya forest.

Interpretative Translation:

O Noble One, quickly prepare my chariot along with bows and arrows—especially the swords with pictographic patterns (*citrān khaḍgān*) and various kinds of sharp-edged, sharp-tipped spears (*śaktī vividhāḥ śītāḥ*).

Footnote: The phrase *citrān khaḍgān* in VR VR3.22.10 means swords with pictographic patterns, which may allude to the natural Widmanstätten patterns, a known characteristic of meteoric iron found on the polished surface of meteoric iron, strengthening the interpretation of the swords being fashioned from celestial iron. An image of a section of the polished surface of the Toluca meteorite showing the appearance of Widmanstätten patterns is shown below:



These descriptions provide compelling evidence that ancient Indians not only recognised meteoric iron but also actively mined and utilised it for crafting hard and sharp tools and weapons. The consistency of *āyas* references across Rigvedic and post-Vedic texts confirms a sustained and sophisticated awareness of this celestial material.

The True Meaning of “Āyas” in the Rigveda

Contrary to Max Müller's assertion that there is no instance in the Rigveda where *āyas* must refer to iron, this study presents, for the first time, compelling internal evidence from within the Rigveda that reveals the true meaning of *āyas* as meteoric ironstone. Drawing on a close philological and cosmological reading of RV6.3.5 and RV6.47.10—two of the earliest Rigvedic hymns—this interpretation centres on the rare and striking phrase *āyaso dhārām*. Rather than a metaphor for intellect or speech, we interpret this phrase literally as a vivid description of **fiery meteoric streams** witnessed by early Vedic seers.

This celestial imagery aligns with modern scientific descriptions of meteor showers, particularly those

involving meteoric iron. Within this framework, Agni is seen as the divine force initiating the descent of these fiery trails, while Indra appears as the protector shielding life from their destructive potential. The cosmological unity between these hymns suggests that such events were not only observed but encoded with symbolic significance in early Vedic thought.

Support for this reading comes from additional texts. RV 10.101.8 contains imagery consistent with celestial metal descent. The Vālmīki Rāmāyaṇa further strengthens this case: in VR 4.41.13, a mining site reveals *ayomukhaḥ*—ironstones with oval-faced indentations—closely resembling **regmaglypts**, a hallmark of meteoric iron. In VR 3.22.10, a sword displays *citrān*, or patterned surfaces, that correspond to **Widmanstätten patterns**, the unique crystalline structures found only in iron meteorites. These references show a continuous awareness—from the Rigveda to the Rāmāyaṇa—of meteoric iron's distinctive form and celestial origin.

Our reinterpretation situates *āyas* not as a generic term for metal—nor as copper or bronze—but as **meteoric ironstone**, a material both terrestrial and cosmic. This perspective bridges Vedic cosmology, early metallurgical knowledge, and observable natural phenomena. It resolves longstanding ambiguities in Vedic metal terminology and restores coherence to the symbolic language of the hymns.

In sum, this study proposes a scientifically grounded and textually supported identification of *āyas* as meteoric ironstone. This interpretation not only illuminates the Vedic imagination but also provides a culturally resonant explanation for the earliest use of iron in the Indian subcontinent.

CHRONOLOGICAL SIGNIFICANCE OF ĀYAS AS METEORIC IRON

The reidentification of *āyas* in the Rigveda as meteoric ironstone, rather than a generic term for metal or smelted iron, reshapes our understanding of the earliest phase of Indian metallurgy. Textual evidence suggests that only two distinct metals were known during the Rigvedic period: *hiranya* (gold) and *āyas* (meteoric iron). The two core insights—*āyas* as exclusively meteoric iron and *hiranya* as gold—mark a civilisational threshold, signalling the emergence of metal use in the Early Vedic era and challenging established timelines of the Indian Metal Age.

Core Insight	Chronological Implications
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Between One and Zero, Brahman and Śūnyatā: Same but Different, Different but Same

During the Rigvedic period, only <i>hiraṇya</i> (gold) and <i>āyas</i> (meteoric iron) were distinctly recognised and ritually significant.	This core sight positions the Rigveda in a civilisational shift—from the Late Neolithic Age to the dawn of the Metal Age. It directly challenges the prevailing mainstream narrative that situates the Rigveda around 1200 BCE, aligning it with the conventional onset of the "Iron Age" in India.
The new interpretation of <i>āyas</i> as meteoric ironstone suggests that the Vedic people discovered naturally occurring fragments of meteoric iron and gradually developed the skills to hot forge this celestial material into small domestic tools and weapons during the Early Rigvedic period.	The new interpretation of "āyas" as meteoric ironstone contrasts sharply with the iron production methods of the Iron Age, which relied on the smelting of terrestrial iron ores and marked a breakthrough in metallurgical innovation. This period witnessed significant advancements in iron ore smelting, leading to the widespread use of iron tools and weapons. Unlike the meteoritic ironworking of the Rigvedic era, the Iron Age, with advanced smelting techniques
Gold (<i>hiraṇya</i>) and meteoric iron were cosmologically integrated and ritually sanctified in the Rigveda.	This core insight suggests that the earliest phase of Indian metallurgy was not merely technological, but deeply symbolic, with metal use deeply embedded in sacred cosmology and ritual practice.

The prevailing archaeological narrative posits that the "Metal Age" in ancient India commenced with the use of copper—widely regarded as the first metal—during the Early Indus Valley Civilisation, around 5500 BCE, and later progressed to the Bronze and Iron Ages. However, the Rigvedic textual evidence points to an alternate trajectory, suggesting that the "Metal age" emerged with the ritual and practical use of gold and meteoric iron in the early Rigvedic Period. While compelling, this hypothesis currently lacks corresponding archaeological artefacts. Nevertheless, the internal consistency of Vedic texts, combined with the scientific plausibility of early meteoric iron use, makes it a viable research avenue—one that calls for renewed interdisciplinary investigation across textual studies, archaeometallurgy, and planetary science.

CONCLUSIONS AND PERSPECTIVES

The Rigveda explicitly recognises only two metals with distinct and consistent terminology. The first is gold, predominantly referred to as *hiraṇya*, and occasionally as *rukma*, both conveying notions of brilliance, value, and ritual sanctity. The second is *āyas*, a term that has long perplexed scholars due to its ambiguous semantic field, which is variously interpreted as a generic term for "metal," specifically copper, bronze, or even gold.

However, this study provides a definitive interpretation of the term *āyas* in the Rigveda. Based on newly decoded internal textual evidence from two key hymns—RV6.3.5 and RV6.47.10—we demonstrate that *āyas* in the Rigvedic context refers specifically to meteoric ironstone. This interpretation resolves longstanding ambiguities by identifying *āyas* not as a terrestrial metal, but as a naturally occurring celestial metal, observed as fiery streaks descending from the sky—spectacular meteoric events that the Rigvedic seers mythologised and encoded within their hymns. The following distinctions help elucidate the true meaning of *āyas* and its compound forms—*karṣṇāyasa* and *śyāmāyasa*—as they appear within the Vedic corpus:

In Summary: The True Meaning of *Āyas* in the Rigveda

What *āyas* is not:

āyas ≠ generic "metal"

āyas ≠ copper

āyas ≠ bronze

āyas ≠ gold

āyas ≠ Smelted Iron

What *karṣṇāyasa* and *śyāmāyas* are not:

krishnāyas ≠ dark metal

śyāma or *śyāmāyas* ≠ dusky (less dark) metal

What *āyas* actually means:

āyas = meteoric ironstone

krishnāyas = dark meteoric ironstone

śyāma or *śyāmāyas* = dusky (less dark) meteoric ironstone

The two key metallurgical revelations—the identification of *āyas* as meteoric ironstone and the recognition that only two metals, gold and iron, were known during the Rigvedic period—offer groundbreaking chronological insights. They suggest that the "Metal Age" in ancient India began during the early Rigvedic era, significantly predating the conventionally accepted onset of the Iron Age around 1200 BCE, when iron smelting from terrestrial ores became widespread in the post-Indus Valley context.

The reinterpretation of *āyas*—grounded in a close reading of Rigvedic texts and reinforced by Late Vedic and post-Vedic sources—as meteoric ironstone significantly deepens our understanding of early

metallurgy in ancient India. This perspective not only reframes the ancient history of metallurgy but also challenges entrenched historical narratives. Most notably, it offers a decisive counterpoint to the Aryan Invasion Theory (AIT), which has long imposed a late chronology on Vedic civilisation around 1200 BCE. Instead, the textual and symbolic evidence points to a highly sophisticated metallurgical tradition embedded in the earliest strata of the Rigveda, reaffirming the indigenous depth and continuity of Vedic culture.

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