

Historical methodology and expert opinion in the Aryan Debate

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We show that Trautmann's criteria to accept expert opinion are compatible with the guidelines for an 'objective historian' proposed by Schneider based on the 'generally accepted standards of historical scholarship' described by Evans. Taken together, they form a credible framework to assess evidences in the Aryan Debate. We show that Sanskrit scholars who support the Aryan Invasion/Migration Theory have implied transmission of cultural practices from 3rd millennium BC India to 2nd millennium BC Eurasia. This tilts the debate on common features found in Indo-European cultures in favour of transmission out of India. We propose the Sanskrit in Indus Civilization Theory (SICT) based on joint consensus between Sanskrit scholars and scientists that Vedic rituals date to 3rd millennium BC. All theories of the origins of the Indo-European language family must incorporate the main elements of SICT when discussing Indian evidences later than 3rd millennium BC. We discuss the methodological issues related to claims based on recent genetic studies. We show that SICT can accommodate the results of recent genetic studies.

William Jones, in a speech delivered before the Asiatic Society in 1786, was the first to propose a common Indo-European language family based on the similarities between Sanskrit and European languages¹⁻⁶. This proposal found favour with several European Sanskrit scholars. Subsequently, in 1847, Max Muller proposed the Aryan Invasion Theory (AIT)^{1,2}. According to AIT, Aryan tribes invaded India from Central Asia in the 2nd millennium BC. The oldest text, the *Rig Veda* was dated to ~1500 BC. The later Vedic ritual texts, *Samhitas* and *Brāhmaṇas*, were dated to ~1000–800 BC. The AIT has been recently modified to the Aryan Migration Theory (AMT) due to lack of any evidence for an invasion. However, the dates of the Vedic texts remain unchanged in the AMT. To this day, linguistic evidences are the mainstay of AMT¹⁻⁶.

From the very beginning, there was also some scepticism to AIT, including among European scholars¹. Later, in 1890s, Tilak⁷ and Jacobi⁸ opposed AIT based on astronomical references in the Vedic texts that gave a higher chronology. From the 1890s to this day, most scientists oppose AIT/AMT⁷⁻¹⁸. Following the discovery of the Indus Valley Civilization in the 1920s to the present time, most archaeologists oppose AIT¹⁹⁻²⁷.

The above evidences have been discussed in several books and articles¹⁻⁶. Most of these discussions are by scholars who are experts in their relevant disciplines. Conversely, they are not experienced (nor are they expected to be so) in addressing diverse evidences, including those outside their professional

domain. Clearly, such discussions reflect the subjective perspectives of specialist scholars. Not surprisingly, such studies have not found broad support. Given the diversity of evidences, the primary issue is to first establish the criteria to accept expert opinions outside one's professional domain. The historian Trautmann³, has proposed the criteria for the same. We have recently shown²⁸ that Trautmann's criteria to accept expert opinion are virtually identical to the judicial criteria to accept expert testimony described in a recent judgment of the Supreme Court of India²⁹. This is an independent confirmation that strengthens the credibility and acceptability of Trautmann's criteria.

In an entirely unrelated development, historian Richard Evans testified as an expert witness in a Court case in England where the issue of historical methodology was central, since the case was a defamation suit filed by one historian against another³⁰. The significance of this case can be appreciated from the fact that the media referred to it as 'history on trial', while Schneider³⁰ refers to it as 'historical methodology on trial'.

The Court eventually went with Evans' description of historical methodology that he also summarized as 'generally accepted standards for historical scholarship'³⁰. Subsequently, Evans³¹ wrote a book where he described the concerns about historians' treatment of evidences. Schneider³⁰ has combined Evans' summary with the Court's evaluation of historical evidences into a set of guidelines for an 'objective historian'.

Therefore, it is of great interest to examine how well Trautmann's criteria

address the guidelines to be followed by an 'objective historian'. We show that Trautmann's criteria are compatible with the guidelines for an 'objective historian'. Taken together, they form a credible framework to assess evidences in the Aryan Debate. The important implications that follow are also discussed. (The discussions on historians' methodology in this note must be viewed as continuation of our earlier discussion of Trautmann's criteria²⁸.)

Trautmann's criteria and general methodology of historians

We have discussed extensively Trautmann's criteria elsewhere²⁸. Briefly, Trautmann³ described the 'fundamental discoveries' (by specialist scholars) that historians must accept as follows: 'These discoveries are fundamental in the sense that the historical facts they uncovered have survived the critical scrutiny of the community of scholars worldwide and are therefore well-established truths of history today and as far as we can see into the future.'

Evans³¹ begins his first chapter, 'History on Trial', by describing concerns about the methods of historians: 'What is historical objectivity? How do we know when a historian is telling the truth? ...' Briefly, he raises concerns about subjectivity in the choice of evidences, cherry-picking of evidences, neglect or underplaying of unfavourable evidences, etc.

Evans had in his report submitted to the Court described the 'generally accepted standards of historical scholarship'

(see footnote 21 of Schneider³⁰). Briefly, he states³⁰ '[D]oes he give a reasonably accurate account of the documents he uses; ... does he, in other words, advance his arguments in a reasonably objective and unbiased manner.'

Combining these with the Court's criteria to assess the claims of historians, Schneider³⁰ has proposed a set of guidelines for an 'objective historian' or 'conscientious historian' as follows:

- (1) She must treat sources with appropriate reservations.
- (2) She must not dismiss counterevidence without scholarly consideration.
- (3) She must be even-handed in her treatment of evidence and eschew 'cherry-picking'.
- (4) She must clearly indicate any speculation.
- (5) She must not mistranslate documents or mislead by omitting parts of documents.
- (6) She must weigh the authenticity of all accounts, not merely those that contradict her favored view.
- (7) She must take the motives of historical actors into consideration.

Compatibility of Trautmann's criteria with the guidelines for an 'objective historian'

We now address the question of how well Trautmann's criteria address the guidelines for an 'objective historian'.

Guideline 1 (G1). She must treat sources with appropriate reservations.

A1. Trautmann's criteria imply that only the long-standing settled consensus among the relevant specialist scholars are to be accepted. This implicitly ensures caution in the treatment of evidences, since these conclusions have withstood the critical scrutiny of generations of expert scholars from different countries.

G2. She must not dismiss counterevidence without scholarly consideration.

A2. All evidences and conclusions that satisfy Trautmann's criteria must be accepted by historians even when they lead to contradictory conclusions. For example, Trautmann described three 'fundamental discoveries': (i) Indo-European language family, (ii) Dravidian language family, and (iii) Indus Valley Civilization. They were accepted by him even though they lead to contradictory conclu-

sions. This shows that if Trautmann's criteria are followed, there is no scope to dismiss counter-evidences.

G3. She must be even-handed in her treatment of evidence and eschew 'cherry-picking'.

A3. According to Trautmann's criteria, the long-standing consensus of experts must be respected and accepted. The constraint against 'cherry-picking' implies that historians cannot pick isolated evidences or an isolated scholar's opinions to contradict the settled consensus of the relevant expert scholars.

For example, linguists cannot cite the views of an archaeologist who supports AIT/AMT when referring to material evidences. Conversely, archaeologists cannot cite the view of a linguist who does not support AIT/AMT when referring to linguistic evidences.

G4. She must clearly indicate any speculation.

A4. The above guideline implies that historians must ensure that the consensus among specialist scholars is based on evidences and proper justifications. They must highlight any speculation, if present. This is a crucial guideline and its importance will be seen later.

G5. She must not mistranslate documents or mislead by omitting parts of documents.

A5. The primary documents in the Aryan Debate are the Vedic texts. Historians have not claimed any expertise in translating or interpreting these texts. Therefore, as long as historians accept the settled consensus interpretations of Sanskrit scholars (and of scientists for the scientific aspects) of Vedic texts, the above guideline is satisfied.

G6. She must weigh the authenticity of all accounts, not merely those that contradict her favored view.

A6. According to Trautmann's criteria, historians must accept the authenticity of all long-standing consensus because they have withstood the critical scrutiny of generations of expert scholars. However, Trautmann³ also states 'Unfortunately, the facts of ancient history are not hard facts, for a couple of reasons. One of them has to do with the many steps in the scholarly processing of such facts before they become recognized facts – there can be disagreement about every stage of such processing, and hence the fact it establishes.' Therefore, it becomes necessary to scrutinize the process of establishing historical facts, including the number and

reliability of each of the steps. However, the scrutiny must be for all the 'fundamental discoveries' and not just selectively for the unfavourable ones.

G7. She must take the motives of historical actors into consideration.

A7. In this regard Trautmann³ states 'The historical study of a document always involves careful attention to the questions of what group of people produced the text and for what purpose it was written.'

The motivation of the authors of the post-Rig Vedic *Samhitas* and *Brāhmaṇas* was to transmit details of the performance and meanings of Vedic rituals from one generation to another. Thus, taking the motives of historical actors into account, it follows that Vedic rituals are the most important evidences in the Vedic ritual texts. This is an important guideline and its significance for the Aryan Debate will be developed further below.

Credible framework to assess evidences in the Aryan Debate

From the above discussion it is clear that Trautmann's criteria are entirely compatible with the guidelines for a 'objective historian' that are based on Evans' description of the 'generally accepted standards of historical scholarship'. Taken together, they form a credible framework to assess evidences in the Aryan Debate. Therefore, all future discussions of the Aryan Debate must adhere to these standards. If not, these standards provide a simple method to identify the transgressions. In particular, historians cannot accept the conclusions of studies that violate their explicitly stated criteria. We discuss some implications of adhering to historians' methodology in the Aryan Debate.

Fundamental discoveries in the Aryan Debate

Trautmann³ described three important 'fundamental discoveries' that satisfied his criteria and represented long-standing consensus. We recently demonstrated in detail that the consensus on Vedic rituals also satisfied Trautmann's criteria²⁸. Therefore, currently, the following four 'fundamental discoveries' are central to the Aryan Debate:

- Discovery of the Indo-European language family (1786).
- Discovery of the Dravidian language family (1816).
- Consensus on the date of ~3000 BC for Vedic rituals (texts) (1931).
- Discovery of the Indus Civilization (1924).

We have shown elsewhere^{28,32} that, starting from Caland³³ in 1931 till date, several Sanskrit scholars^{5,33-37} who support AIT/AMT have also interpreted the most important Vedic ritual days (ekāṣṭaka, Mahāvratā, Mahāśivarātri, winter solstice, etc.) to ~3000 BC, similar to scientists who oppose AIT/AMT. No scientist has analysed these settled interpretations to ~1000 BC. It is important to note that scientific analyses of the interpretations of the most important Vedic ritual days are in the professional domain of scientists.

Since the most important Vedic rituals represent the cyclical year, their proper understanding requires combined expertise of Sanskrit scholars and scientists³². Since they are in agreement, it is appropriate to refer to it as the 'joint consensus'. It is clear that the joint-consensus on Vedic rituals transcends support or opposition to AIT/AMT, making it the most credible consensus in the Aryan Debate.

Two dates for the Vedic texts – implications for specialist scholars

From the four fundamental discoveries, it follows that there are two different dates for the Vedic texts. The consensus among linguists leads to dates of around ~1500 BC for the *Rig Veda* and ~1000 BC for the *Samhita* and *Brāhmaṇa* ritual texts. In contrast, the consensus among Sanskrit scholars and scientists leads to dates of around ~3000 BC for the same Vedic ritual texts^{28,32}. It follows that the *Rig Veda* is older than ~3000 BC.

The fact that there is consensus on two different dates raises the question regarding the date of Vedic texts specialist scholars should use in their studies. We note that archaeologists, geologists, geneticists, etc. do not have any expertise to choose between the two dates for the Vedas. Further, their choice cannot be arbitrary and must be consistent with Trautmann's criteria.

Currently, Sanskrit scholars who support AIT/AMT use dates obtained from linguistics to study Vedic rituals. This approach is fundamentally flawed because consensus based on evidences in one discipline is extrapolated beyond its domain to interpret evidences in another discipline, where a different consensus exists. It clearly violates Trautmann's criteria that the settled consensus (in each discipline) must be respected. In addition, in this instance, it leads to Sanskrit scholars disrespecting their own interpretations of Vedic rituals.

We propose our solution to the above question. Whenever specialist scholars refer to the linguistic aspects of Vedic texts they must use the dates that follow from the consensus among linguists, i.e. ~1500 BC for *Rig Veda* and ~1000 BC for the Vedic ritual texts. On the contrary, whenever specialist scholars refer to the contents of the Vedic texts, e.g. religious practices, cultural practices, etc. they must use the dates that follow from the consensus on Vedic rituals among Sanskrit scholars and scientists, i.e. ~3000 BC for Vedic ritual texts. This way Trautmann's criteria are adhered to as the relevant settled consensus is respected. To further illustrate this aspect, we discuss two specific examples below.

Origins of Śaivism and Mahāśivarātri

We have discussed the origins of Śaivism and Mahāśivarātri in detail elsewhere^{17,32}. Briefly, we have pointed out that in the interpretations of several Sanskrit scholars (who support AIT/AMT), Śaivism and Mahāśivarātri originated in the Brāhmaṇa period. In particular, Mahāśivarātri was celebrated just before winter solstice when it originated. This directly leads to ~3000 BC for the Brāhmaṇa period.

However, Sanskrit scholars used dates of ~800 BC for the Brāhmaṇa period on the basis of linguistic evidences³². It is readily evident that linguistics has no direct relevance to the study of the origins of Śaivism and Mahāśivarātri, which is based on the contents of the Vedic texts. It is incorrect to refer to dates obtained from linguistic evidences when their own interpretations of Mahāśivarātri give an internal date (of ~3000 BC) that is directly relevant.

Cultural practices associated with Vrātyas across Indo-European cultures

The subject of Vrātyas has been studied by Sanskrit scholars for more than 150 years^{36,38-41}. According to Edholm³⁹, 'That the ancient Indian Vrātya continues to engage scholars, and rightly so, is demonstrated by two recent publications...' He ends his article with the statement 'A complex subject such as that of the Vrātya allows for a plurality of interpretations.'

We will not venture to make any non-scientific contributions into the discussions on Vrātyas. However, our contributions focus on the calendar features linked to the cultural practices of the Vrātyas.

We briefly summarize the views of Sanskrit scholars on Vrātyas^{36,38-41}. They were all-male aggressive groups or warrior bands who would raid neighbouring territories. Their rituals were closely associated with winter solstice. Pañcaviṃśa Brāhmaṇa³³ states that the Vrātyas performed a 61-day ritual that lasted all of the season Śiśira. Since Śiśira was the first season after winter solstice, it follows that this ritual began at winter solstice³³. Other scholars have noted a close connection between Vrātya rituals and ekāṣṭaka and/or Mahāvratā days^{36,40}.

Some scholars have found similarities between cultural practices of Vrātyas and practices in other Indo-European cultures, including Germanic and Roman cultures^{36,40}. Kershaw⁴⁰ has referred to Vrātya rituals that began on ekāṣṭaka and similar practices among Germanic tribes. However, their interpretations use dates of ~1000-800 BC for the Vedic ritual texts derived from linguistics for Vrātya cultural practices, implying a common Indo-European cultural practice that spread from somewhere in Eurasia.

We see that Sanskrit scholars have linked Vrātya cultural practices to Śiśira, ekāṣṭaka, Mahāvratā, etc. in the Vedic texts^{33,37,40,41}. Mahāvratā was an important ritual day that was just before the last day of the (lunar) year that ended at winter solstice. Ekāṣṭaka was the eighth day after full moon of the month of Māgha and was very close to winter solstice, which leads to dates of ~3000 BC (ref. 17). These seasons and lunar days (based on nakṣatra months) are purely Indian calendrical features that are not present in other Indo-

European cultures. Therefore, the correct interpretation is that Vrātya cultural practices linked to ekāṣṭaka, Mahāvratā, etc. in the Brāhmaṇa texts actually date to ~3000 BC. These are the dates that are directly relevant to the Vrātya cultural practices and not those from linguistics.

We get a completely different picture when the correct date for Vrātya cultural practices is used. Prima facie, it suggests a transmission of cultural practices associated with Vrātyas around ~3000 BC or even earlier (if *Rig Veda* is also to be considered) to 2nd or 1st millennium BC cultural practices in Eurasia and Europe.

In this regard, Anthony and Brown⁴¹ studied remains of dog bones in an archaeological site in southern Russia, and interpreted it to be similar to the cultural practice of Vrātyas and other Indo-European aggressive all-male bands. They date these findings to ~1500–1900 BC. Edholm³⁹ and Witzel⁴² refer to this inference.

Anthony and Brown⁴¹ specifically state ‘Among the Śvapaca were the people called the Vrātyas. They were known for performing a mid-winter ceremony called Ekāṣṭaka at the winter solstice...’. As mentioned earlier, ekāṣṭaka coincided with winter solstice around ~3000 BC. Thus, their interpretation, contrary to their claim, actually provides archaeological evidence for transmission of Vrātya cultural practices around ~3000 BC to Eurasian cultural practices ~1500–1900 BC.

We note that *Aitareya Brāhmaṇa* verse AB 8.14 refers to the Uttarakuru region that Sanskrit scholars have interpreted to refer to regions beyond the Himalayas⁴³.

After studying the mathematics of Vedic fire-altars (Agnicayana), Seidenberg^{44,45} concluded that (i) it was older than the mathematics of 1700 BC Babylon and (ii) this mathematical knowledge was transmitted to Babylon and Greece. Though Seidenberg was unaware, we now know that the joint consensus among Sanskrit scholars and scientists dates Agnicayana to ~3000 BC (refs 28, 32). This confirms Seidenberg’s dates and supports his conclusion of transmission of mathematical knowledge out of ~3000 BC India to 1700 BC Mesopotamia and later Greece¹⁸.

Thus, while suggestions of cultural transmission out of ~3000 BC India have been made earlier, from the discussion on Vrātyas we see, that Sanskrit scholars who are the primary supporters of AIT/

AMT have also implied cultural transmission out of ~3000 BC India into ~2000–1000 BC Eurasia and Europe.

The implications can hardly be overstated.

While the proponents of AIT/AMT have interpreted common words, etc. found in several Indo-European cultures to indicate late movement of Indo-European speaking peoples into India, opponents of AIT/AMT have interpreted them to indicate cultural transmission out of India. For example, the Mitanni treaties dated to ~1500 BC contain references to Gods and words found in the *Rig Veda*. They have been interpreted by AIT/AMT proponents to imply lower dates for the *Rig Veda* and Sanskrit language. In contrast, opponents of AIT/AMT have interpreted them as evidence for cultural transmission out of India. Bryant¹ provides a detailed discussion on the Mitanni treaties.

However, it follows from the above discussion on Vrātya cultural practices that all contested claims of common features in various Indo-European cultures dated to ~2000–1000 BC can now be credibly (since it also includes the scholarship of Sanskrit scholars who support AIT/AMT) interpreted to be the result of cultural transmission out of ~3000 BC India.

Sanskrit in Indus Civilization Theory – new theory based on Vedic ritual texts

At present, the main theories to discuss the Indo-Aryan controversy are AIT/AMT and the Out of India Theory¹⁻⁶. The primary emphasis of these theories is on the origins of the Indo-European language family. There are two possibilities within AIT/AMT for the origins of the Proto-Indo-European language (PIE)²⁰, with (i) the Anatolian hypothesis proposing early ~7000 BC origins of PIE in Anatolia, and (ii) the Steppe hypothesis proposing a ~4000 BC origin of PIE in Eurasia. In contrast, the OIT proposes that India is the homeland of the Indo-European language family and Sanskrit is much older than ~1500 BC (refs 1, 2).

The above theories overemphasize the oldest time periods for which actual evidences are thin or non-existent. For example, the Anatolian and Steppe hypotheses differ by 3000 years as to the date of PIE origins. That is, there is no con-

sensus on either the place or date of PIE origins. It must be recognized that all theories of PIE origins are speculative because of the absence of contemporaneous evidences. In the Indian context, they refer to time periods that pre-date the *Rig Veda*.

Unfortunately, speculative theories of PIE origins have become the framework to interpret the stronger evidences. Clearly, this is not the most credible method to formulate theories. (We recall that one of the guidelines for an ‘objective historian’ is that ‘she must clearly indicate any speculation’.) An alternate approach would be to formulate theories (that may be limited in scope) centred on robust evidences. This approach is adopted below.

As discussed earlier, the joint consensus on dates of ~3000 BC for Vedic rituals transcends support (from Sanskrit scholars) or opposition (from scientists) to AIT/AMT, making it the most credible consensus in the Aryan Debate. We also recall that one of the important guidelines for an ‘objective historian’ is that she ‘must take the motives of historical actors into consideration’³⁰. As discussed earlier, this guideline implies that Vedic rituals are the most important evidences in the Vedic ritual texts. This is consistent with the views of Sanskrit scholars and the Vedic texts themselves³².

Based on these strong foundations of Vedic rituals, we propose the Sanskrit in Indus Civilization Theory (SICT), according to which Sanskrit was spoken in the Indus Civilization as evidenced by the fact that Sanskrit scholars and scientists have interpreted the most important Vedic rituals to ~3000 BC. Since the *Rig Veda* is older than the Vedic ritual texts, it follows Sanskrit is older than ~3000 BC. However, because there is no robust consensus on the date of the *Rig Veda*, it is difficult to be specific about the actual date of the origins of Sanskrit.

Secondly, the geographical area referred to in the Vedic texts are mostly northwest India, between the Indus and Sarasvati rivers, and include the region covered by the five Punjab rivers. This geographical region is also part of the Indus Civilization. It follows that SICT implies a correlation between Indus civilization and Vedic culture.

SICT supports the views of several archaeologists that the Indus culture was Aryan¹⁹⁻²⁷. For example, Renfrew²⁰ states ‘It is difficult to see what is particularly non-Aryan about the IVC.’ Schaffer

and Lichtenstein²³ state ‘The archaeological record and ancient oral and literate traditions of South Asia are now converging with significant implications for South Asian cultural history.’

Regarding the religion of the Indus Civilization, Dhavalikar²⁵ states ‘The most important feature of the Vedic religion is fire worship, and the same seems to be the case with the religion of the Late Harappans. Well made fire altars have been discovered in the excavations at Bhagwanpura and other Late Harappan settlements. Fire worship was also in vogue in the Urban Harappan times as is evidence from those at Kalibangan and Lothal.’ We note that it is not an isolated view and several archaeologists hold similar views²⁷. (In another aspect, archaeologists’ claims of Śiva worship in the Indus Civilization correlate well with Sanskrit scholars’ interpretations of Śiva worship in Vedic texts³².) SICT is compatible with the above views of archaeologists.

Thirdly, SICT has important implications for future studies of the Indus Civilization. As discussed earlier, specialist scholars have to choose between two different dates for the Vedic texts. It is most improbable that scholars who study various aspects of the Indus Civilization will attempt to correlate their findings with linguistics. Rather, the attempt would be to correlate their findings with the contents of the Vedic texts. As discussed in the previous section, in such a case the dates of ~3000 BC for the Vedic ritual texts are the ones that are relevant. Therefore, in future studies, archaeologists and other scholars need to refer to the joint consensus on Vedic rituals, rather than the consensus on linguistics, whenever they refer to the contents of Vedic texts. This also applies to Sanskrit scholars’ future evaluations of claims of correlations between Indus Civilization and Vedic texts, especially because they are a party to the joint consensus.

Fourthly, SICT accounts for the 3rd millennium BC cultural contacts of Indus Civilization with regions beyond the Himalaya as evidenced by references to Uttarakuru in the *Brāhmaṇa* texts and other evidences, including interpretations of Sanskrit scholars with regard to the transmission of cultural practices associated with Vṛatyas discussed above.

It is also important to note what SICT does not say. It does not say that the Indus Civilization was an exclusively

Sanskrit-speaking civilization, but rather states that Sanskrit was definitely one of the languages spoken. Suggestions that other languages (e.g. Dravidian, Austro-Asiatic, any other Indo-European language, etc.) were spoken in the Indus Civilization can be accepted if proven, but cannot negate the joint consensus that Sanskrit was definitely spoken.

The same arguments apply to the cultural aspects of the Indus Civilization. That is, we can state that Vedic culture was definitely part of the Indus Civilization without asserting that the entire Indus Civilization was Vedic.

However, SICT is silent on questions that still arise. For example, the question whether the Sanskrit language/Vedic culture was restricted to an elite group or a peripheral group, or whether it was the language/culture of majority of the population cannot be answered by SICT. These are questions that archaeologists and other scholars need to address.

Most importantly, SICT is silent on the origins of the Indo-European languages. It is compatible with Indian origin, modified Anatolian origin, or any other geographical origin of Indo-European languages as long as any such theory recognizes that Sanskrit is older than ~3000 BC.

It is readily compatible with the OIT, since it recognizes that Sanskrit was spoken in the Indus Civilization.

It is also compatible with the Anatolian origins of PIE with some modifications. The Anatolian hypothesis proposes that PIE originated in Anatolia around ~7000 BC and spread²⁰. In particular, it claims that some unknown Indo-European language (not Sanskrit) was spoken in the Indus Civilization. Later, in the 2nd millennium BC, the older Indo-European language was replaced by Sanskrit by immigrants from Central Asia. This hypothesis relies on the linguists’ date for the *Rig Veda* of ~1500 BC.

However, the joint consensus on Vedic rituals needs to be incorporated. Therefore, if the Anatolian hypothesis is modified to recognize that it was Sanskrit and not some unknown Indo-European language that was spoken in the Indus Civilization, it readily becomes compatible with SIET.

An important aspect of SICT is that it separates the question of PIE origins from the discussions on later periods, i.e. after ~3000 BC. This separation is important so that robust evidences are not in-

terpreted in the framework of speculative theories. Therefore, any theory of PIE origins must incorporate the main features of SICT when discussing evidences and events in India later than ~3000 BC. Any theory that does not do so must be rejected as incorrect, as it would ignore the most credible consensus in the Aryan Debate.

Sanskrit in Indus Civilization Theory and genetic evidences

Recently, studies based on ancient DNA have made claims to participate in the Aryan Debate⁴⁶⁻⁴⁸. At present, there is no consensus on the conclusions from genetics studies⁴⁶⁻⁴⁸. However, some studies have made strong claims that we examine below in the framework of historical methodology in the Aryan Debate^{47,48}.

One of the main problems with ancient DNA studies is that the conclusions have been reported by conflating the results from genetics with linguistic hypotheses. The limitations of genetic studies are described by, for example, Haak *et al.*⁴⁹ who state ‘the findings from ancient DNA are silent on the question of the languages spoken by preliterate populations...’. Given this explicit acknowledgement of the limitations of ancient DNA studies, conflating the conclusions from genetics with linguistic hypotheses is without any basis and is purely speculative and outside the professional domain of geneticists. This approach has several methodological problems as discussed briefly below.

First, we cite from a recent judgment of the Supreme Court of India²⁹: ‘This Court in the case of Hazi Mohammad Ekramul Haq v. State of W.B. concurred with the finding of the High Court in not placing any reliance upon the evidence of an expert witness on the ground that his evidence was merely an opinion unsupported by any reasons.’ Another recent judgment of the Supreme Court of India states⁵⁰: ‘Mere assertion without mentioning the data or basis is not evidence even if it comes from expert.’

Secondly, one of the guidelines for an ‘objective historian’ is that ‘she must clearly indicate any speculation’. It is clear that the core genetic results and the speculative conflation with linguistic hypotheses cannot be considered to have the same credibility. Further, it follows

from Trautmann's criteria that population geneticists are only responsible for conclusions within their professional domain, viz. genetics.

Thirdly, archaeologist Klejn⁵¹ has recently discussed the shortcomings of the geneticists' approach as follows: 'My main concern is that, to my mind, one should not directly apply conclusions from genetics to events in the development of language because there is no direct and inevitable dependence between events in the life of languages, culture, and physical structure (both anthropological and genetic). They can coincide, but often they all follow divergent paths. In each case, the supposed coincidence should be proved separately'. He further discusses this theme in an article titled 'The Steppe hypothesis of Indo-European origins remains to be proven'⁵². It is clear that geneticists need to prove their speculative conflation of genetics results with linguistic hypotheses for it to be accepted by other scholars in the Aryan Debate.

Fourthly, the speculative claims of geneticists lead to a (false) contradiction between different scientific evidences. We have discussed in detail elsewhere that evidences from astronomy (mostly pertaining to calendar schemes that regulated the performance of Vedic rituals) and mathematics suggest that there is no scientific basis for AIT/AMT^{17,18}. The claims of geneticists in support of AIT/AMT contradict the conclusions from these scientific evidences. This would be a serious contradiction if it were true. As mentioned earlier, the joint consensus dates the varied references to the most important ritual days consistently to ~3000 BC. That is, the dates of ~3000 BC are proved in several different ways and are robust^{28,32}.

Regarding evidences from mathematics, it is essential to note that Seidenberg^{44,45} proved his claims solely by examining mathematical evidences. He was a professor of pure mathematics (at UC Berkeley, USA) and used the word 'proved' with the associated sense of responsibility. For example, he states⁴⁴ 'As to the common source of Babylonian and Vedic mathematics, though at one point in the argument I used the word postulate, I now regard my thesis as proved.'

It is only after proving his claim by examining mathematical evidences that Seidenberg referred to Jacobi's higher chronology⁸ in support of his conclu-

sions. In contrast, geneticists have not proved their claims on the basis of genetic evidences. They need to do so for their claims to have independent validity.

It is clear that the contradiction between different scientific evidences is precipitated because of the unproven speculative conflation of genetic results with linguistic hypotheses. Thus, this contradiction is artificial and not genuine.

Fifthly and more broadly, the speculative claims of geneticists veer dangerously close to what Romer (Nobel Prize in Economics, 2018) describes as a 'failure mode of science'. Drawing parallels between string theory and macroeconomics, he states⁵³ 'A parallel with string theory from physics hints at a general failure mode of science that is triggered when respect for highly regarded leaders evolves into a deference to authority that displaces objective fact from its position as the ultimate determinant of scientific truth'.

There is great danger that the speculative claims of geneticists may be misinterpreted as scientific claims because they are made by highly respected geneticists. Romer⁵³ states that 'an efficient defense of science will hold the most highly regarded individuals to the highest standard of scientific conduct.' This criterion combined with Haak's statement above implies that geneticists need to be silent on the question of languages spoken by ancient peoples.

At the very least, when speaking of languages, geneticists must explicitly clarify that their speculative and unproven conflation of genetics results with linguistic hypotheses do not have the same credibility and reliability as their genetics results alone.

For all the above reasons, scholars cannot accept the results of the unwarranted conflation of genetics results with linguistic hypotheses. Thus, all scholars only need to consider the conclusions reached solely from genetics data. An important consequence that follows is that genetic studies cannot have any view on the joint consensus that Sanskrit is older than ~3000 BC.

Some recent genetic studies suggest an influx from Central Asia into India in the 2nd millennium BC that has been conflated with linguistic theories to claim genetic evidence in support of AIT/AMT^{47,48}. However, as discussed above, we need to consider only the genetics

part of the conclusions. This simply means that there was an influx from Central Asia into India in the 2nd millennium BC, of people who spoke an unknown language, since 'ancient DNA are silent on the question of the languages spoken by preliterate populations'⁴⁹. This can easily be shown to be compatible with SICT.

We recall that according to the joint consensus on Vedic rituals, Sanskrit was already spoken in India before ~3000 BC. The genetics data can be readily interpreted to imply that immigrants from Central Asia came to India around ~1500 BC and were absorbed in the local Sanskrit-speaking culture. That is, even though they spoke an unknown language when they arrived, in due course they merged into the local culture and became Sanskrit speakers. We note that this process of assimilation has occurred several times in Indian history. The above explanation is also consistent with the consensus among archaeologists that there is continuity in the archaeological record contrary to disruption implied by AIT/AMT¹⁹⁻²⁷.

Some geneticists are aware that 'their (Indo-Aryan invasions)' very existence is challenged by many archaeologists⁴⁷. Thus, if geneticists decide to participate in the broader Aryan Debate, they need to consider all qualifying evidences (according to Trautmann's criteria). In such a case, the above explanation is plausible since it accounts for several qualifying evidences in the Aryan Debate.

Conclusion

Trautmann's criteria to accept expert opinion in the Aryan Debate are compatible with Schneider's guidelines for an 'objective historian' that are based on the 'generally accepted standards for historical scholarship' described by Evans. Together they form a credible framework to assess evidences in the Aryan Debate. We show, that Sanskrit scholars who support AIT/AMT have implied transmission of cultural practices from ~3000 BC India to ~2000-1000 BC Eurasia. This tilts the debate on common Gods, words, practices, etc. found in several Indo-European cultures in favour of transmission out of India. We propose the SICT that rests on the robust consensus between Sanskrit scholars and scientists that Vedic rituals date to ~3000 BC.

HISTORICAL NOTES

All theories on the origins of Indo-European languages must incorporate the main elements of SICT when discussing evidences from India later than ~3000 BC. We discuss the methodological issues related to the claims of geneticists. We show SICT can accommodate the results of recent genetic studies.

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