On the meaning of AV XIX.53.3: Measurement of Time?

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1 Introduction

This mantra is the third ṛk of the sūkta (XIX. 53) in Atharvaveda. This sūkta and the next sūkta (XIX. 54) constitute the well known Kālasūkta-s which are theosophic and cosmogonic in character and have been studied by many scholars1–6. The mantra itself has been characterized as an enigmatic mantra “of incomparable beauty and suggestive force”5 in the Kālasūkta-s. Given below are the translations of various scholars, which are all based on the commonly accepted padavibhāga:

1. A full jar has been placed upon time.
   Him, verily we see existing in many forms.(Bloomfield1)

2. The whole of this universe is stationed in the Omnipresent God.
   We, the good ones on the earth see him in various ways.(Devichand2)

3. On time is laid an overflowing beaker.
   This we behold in many a place appearing.(Griffith3)

4. A full jar has been placed upon time.
   We behold him existing in many forms.(Muir4)

5. Above Time is set a brimful vessel.
   Simultaneously we see Time here, there, everywhere.(Panikkar5)

6. A full vessel is set upon time.
   We indeed see it, being now manifoldly.(Whitney6)

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2Devichand, The Atharvaveda, Munshiram Manoharlal publishers (New Delhi, 1994) p. 782

It is obvious that the translations given by all these scholars, except Devichand\textsuperscript{7}, are basically literal and that the “full vessel” in the first part of the mantra is enigmatic. Several explanations, none of which is fully satisfactory, have been given. For example, Bloomfield\textsuperscript{1} quotes Ludwig as explaining the “full jar” as the sun. Griffith\textsuperscript{3} explains “the beaker” as the “sun imagined as a golden urn overflowing with light.” Panikkar\textsuperscript{5} says that the vessel set upon Time is so full that however much is drawn from it, it never empties. A more satisfying explanation is considered to have been given by Śaṅkara, according to whom, “pūrṇāḥ” means “sarvatra vyāptāḥ,” pervading everywhere; and “kumbhāḥ” is explained by “kumbhavat kumbho ahorātra-māsa-ṛtu-saṃvatsarādī-ṛūpo -vachchinno janyāḥ kālah.” Śaṅkara sees in kumbha, divisible, and hence measurable, time in the form of day, night, month, seasons, and year etc., in contrast to kāla, the eternal/indivisible time. Another plausible explanation derives from the work of Witzel\textsuperscript{8} on the circumpolar motion of the Big Dipper, especially when the next line in the sūkta is also considered:

\begin{quote}
“sa imā viśvā bhuvanāni pratyāḥ kālaṁ tam āhuḥ parame vyoman”
\end{quote}

It faces all beings here (on earth); they call it “time” in the highest firmament.’

The “kumbha” could then refer to the vessel of the Big Dipper in the highest sky (parame vyoman). “pūrṇāḥ kumbhāḥ” would refer to the vessel considered full when it is up-turned, (empty when it is down-turned at other times), and the ‘many forms’ could refer to the various positions the vessel takes in the sky each night/year\textsuperscript{9}. It is suggested in this note that, in fact, a literal translation of this enigmatic mantra could lead to a plausible reference to measurement of time using an out-flowing water clock.

2 Time and the Vedic ritual yajña

The ritual yajña is central to the Vedas. It is imperative that the rituals be performed on time and according to “vidhi”, or else.

\begin{quote}
tad etat satyaṁ maṇḍroṣu karmāṇi kavayo yāṇy āpasyaṁ tāṁ tretāyāṁ bahudhā santatāṁ tāṁ ācaratā nityāṁ (MU I. 2.1)
\end{quote}

“This is the truth. The rituals, which the sages saw in the hymns, are variously spread forth in the three Vedas. Perform them constantly.”

\textsuperscript{7}Moreover, Devichand uses the unemended text (which is also used by Satavalekar and S. P. Pandit): nu santaḥ in the mantra.


\textsuperscript{9}I am grateful to Professor Witzel for pointing out this explanation. However, because of the circumpolar nature of the motion, the Big Dipper is up-turned (full vessel) at the lowest part of the sky and down-turned (empty) when it is highest in the sky. Furthermore, the latitude of the place determines if the entire Big Dipper is circumpolar. At the current epoch 2000 AD, at the latitude corresponding to New Delhi (28 degree N), except alpha-Ursa Major, none of the other members of the Big Dipper are circumpolar; therefore, it is never seen as a “full vessel”. It is seen fully down-turned at the highest position in the sky around midnight on March 15. From December through May it is seen in the fully down-turned position some time at night. However, around 1200 BC, at the latitude of Delhi, the entire Big Dipper was circumpolar, and could be seen as “full” around midnight in July; it would have been “full” at some time during the night from about May through October. The rest of the year it would only have been seen as emptying.
yasyāgnihirotam adārṣaṁ apaunānamāṇaṁ acāturnāsyaṁ anāgrayaṇaṁ atithivarjitaṁca aṅhutaṁ avaśvādevaṁ avadhīnāhutaṁ ṣaṣṭaptamāṁ ṣasya lokaṁ hinasti (MU I. 2.3)

“He, whose āgniḥotra sacrifice is not [followed by] the sacrifices of the new moon, and the full moon, by the cāturnāsyā sacrifice, by the ritual āgrāyaṇa [performed in the harvest season], who is without guests, is without oblations, [and] is without ceremony to all the gods, or who gives offerings contrary to the rule, [because of such conduct], destroys his worlds till the seventh.”

With such strong injunction, the Vedic people had to know time in order to perform yajñā properly. It is obvious that they knew the various divisions of time, such as saṃvatsara (RV I. 110.4), māṇa (RV I. 25.8), ṛtu (RV I. 49.3), and muhūrta (RV III. 33.5; TB III. 10.1.1); shorter intervals of time such as ksipra, etarhi, idāni etc., were also familiar (ŚB 12.3.2.5). By the time of VJ, the time units appear to have already been standardized:

kalā muhūrtāṁ kāṣṭhāṁ ca ahorātraṁ ca sarvāsāḥ
ardhamāsā māsāḥ ṛtavas saṃvatsarasāḥ ca kalpantāṁ (MNU I. 2.3–4)

VJ describes the use of water clocks and VJ itself is known as “kālavidhāna śāstra”. In earlier times, they could easily keep track of longer time segments like ahorātra, māsas, and saṃvatsara by astronomical observations. But, how did they keep track of smaller units of time such as kāṣṭhā, ksipra, or muhūrta?

3 A simple translation of AV (XIX.53.3) and measurement of time

It is generally taken as a rule that a student of the Veda should interpret and explain the Vedic texts just as they have been handed down, and should not venture emendations of these holy texts. In some cases, however, a conjecture, perhaps in the form of a sandhi or a padavibhāga may be justified, if it clarifies an issue or provides a better meaning, provided the mantra itself is not altered. It is suggested that the mantra under discussion can be understood better by an alternate word division (padavibhāga) of the first part of the mantra. The new padavibhāga is only slightly

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10 The relationships among these time units are given in ŚB 12.3.2.5:

- 1 kāṣṭhā = 15 ksipra
- 1 ksipra = 15 etarhi
- 1 etarhi = 15 idāni
- 1 idāni = 15 breathings
- 1 breathing = 1 spiration = 1 twinkling (nimesā).

11 The relationships among these time units can be found in VJ.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>124 kāṣṭhās</td>
<td>1 kalā</td>
</tr>
<tr>
<td>20 and 1/10</td>
<td>1 muhūrta</td>
</tr>
<tr>
<td>30 muhūrta</td>
<td>1 ahorātra (day and night)</td>
</tr>
<tr>
<td>2 parvams</td>
<td>1 cāndramāsa</td>
</tr>
<tr>
<td>2 months</td>
<td>1 ṛtu</td>
</tr>
<tr>
<td>2 apanas</td>
<td>1 year</td>
</tr>
</tbody>
</table>
different from the one given earlier, and is obtained by regarding the words \textit{adhi} and \textit{kāla} as forming a single compound word \textit{adhikālaṃ} (\textit{avyayībhāva samāsa}). Compound words with \textit{adhi}-, such as \textit{adhidevatā}, \textit{adhiyajña}, etc., are found quite commonly in Brāhmaṇa and Upaniṣad texts. The \textit{mantra} would then read:

\[
/ \text{pūrṇaḥ kumbho dhikālaṃ āhitastam vai paśyāmo bahudhū nu santam} / 
\]

It may be noted that in so doing the \textit{mantra} itself is not altered in any substantial way, only an extra \textit{anusvāra}, a \textit{bindumātraṃ} (as indeed found in several Indian editions), is added. The intuitive support for the idea of using the word \textit{adhikālaṃ} is derived from the connection between \textit{yajña} and \textit{kāla}. It is well known from Brāhmaṇa and Upaniṣad texts that there is equivalence between \textit{yajña} and Prajāpati on the one hand (for example, \textit{yajñaḥ pra ḍa ṭaḥ iti}, BU.3.9.6), and between Prajāpati and \textit{saṁvatsara} on the other (\textit{saṁvatsaro vai pra ḍa ṭaḥ}, PU.1.9). Therefore, there is equivalence between \textit{saṁvatsara}, which is \textit{kāla}, and \textit{yajña} (\textit{saṁvatsaro yajñaḥ pra ḍa ṭaḥ}, SB.1.1.1.13). As the word \textit{adhiyajñaṃ} is quite commonly used in Upaniṣads, it gives credence to the word \textit{adhikālaṃ}. The use of the compound word \textit{adhikālaṃ} has shifted the emphasis from \textit{adhi} to \textit{adhikālaṃ}. When the compound word is used, \textit{adhikālaṃ āhitah} means simply \textit{kåle āhitah}. Here, \textit{kåle} means \textit{kālavisaye}, i.e., with reference to time. Thus, the word \textit{adhikālaṃ} can be discussed in the same way as those denoting the following entities:

\begin{itemize}
\item \textit{adhilokaṁ}
\item \textit{adhiyotiṣaṁ}
\item \textit{adhividyam}
\item \textit{adhiprajñaṁ}
\item \textit{adhyātmaṁ}
\end{itemize}

referred to in Taittirīya Upaniṣad. In the latter context, the meaning of \textit{adhi} is also “with reference to” or “concerning”, just as discussed above. The \textit{mantra} can then be taken to read:

“\begin{quote}
A full vessel is set with reference to time.
\end{quote}"

Sāyaṇa has already alluded to \textit{kumbha} as representing measurable time. Taking a hint from Sāyaṇa, it is suggested that the translation of the \textit{mantra} be given as:

“\begin{quote}
A full vessel is set \textit{[up]} with reference to \textit{[measurement of]} time.
\end{quote}"

This is just a literal translation. The word \textit{kumbha} is generally taken to refer to a spherical vessel. However, it can refer to vessels of other shapes also as can be verified from Monier William’s dictionary (p.293). In fact, Bloomfield translates it as a jar, which is cylindrical. A cylindrical vessel, which is full when set up with reference to measurement of time would imply an out-flowing water clock\footnote{Fleet, J. F., “The ancient Indian water clock”, \textit{Journal of the Royal Asiatic Society}, 213–230, (1915). There are generally two types of water clock used in ancient India.

(I) Outflow type: This is a cylinder with known dimensions with a small hole (of a specified size) near the bottom from which the water flows out. Initially, the cylinder is filled with water. The time required for the water to flow out completely is one \textit{nāḍika} (2 \textit{nāḍika}-s = 1 \textit{mahārta}).

(II) Floating Bowl type: This is a hemispherical bowl, which has a hole at its bottom from which water flows in. It sinks after a definite interval of time, usually also one \textit{nāḍika}.}, a \textit{ghaṭika}, such as the type referred to in VJ. Thus the \textit{mantra} appears to refer to an out-flowing water clock.
4 Additional comments

Support for this simple idea is obtained from the very next part of the mantra:

:\[ \text{tam vai pasyamo bahudha nu santam} \]
\[ \text{"We indeed see it existing in many forms"} \]

perhaps referring to water clocks of different forms! There is no need to twist and stretch the text to be interpreted in the way we read into it. It may be noted that according to Madhvācārya, the founder of the Dvaita school of Vedānta, Vedas can be understood at three different levels (\text{trayārtham śruti}u). The literal meaning given above is at the lowest level referring to the physical element \text{kāla} and is not in conflict with the traditionally accepted meaning given by Sāyaṇa, which is at a higher level. Furthermore, the interpretation given here adds another dimension to the meaning of the mantra, the practical, of measurement of time. In a different context, adhi would mean supreme. Then \text{adhikāla} would refer to the Cosmic Time. It would then appear as if the mantra is using the language of a physicist, with \text{pūryaḥ kumbhaḥ} referring to a local origin of time. It is as if the mantra is saying

:\[ \text{"Set t = 0 when the vessel is full; the range of Time is from – infinity to + infinity."} \]

5 Conclusion

An alternate \text{padavibhāga} of the mantra AV (XIX. 53.3)

:\[ / \text{pūryaḥ / kumbhaḥ / adhikāla / āhitaḥ} / \]
\[ / \text{tam / vai / pasyāmaḥ / bahudha / nu / santam} / \]

leads to a simple literal translation:

:\[ \text{"A full vessel is set \[up\] with reference to \[measurement of\] time. We indeed see it existing in many different forms."} \]

This implies the use of an out-flowing water clock for measurement of time and perhaps, the existence of different types of water clock. This interpretation clarifies the enigma that has puzzled scholars for a century. It is not in conflict with the traditionally accepted interpretation of Sāyaṇa, but adds to it a utilitarian aspect not considered so far.

List of Abbreviations

\text{AV} \quad \text{Atharvaveda}

\text{BU} \quad \text{Brhadāraṇyaka-Upaniṣad}

\text{MU} \quad \text{Munḍaka-Upaniṣad}
MNU Mahānārāyaṇa-Upaniṣad
PU Praśna-Upaniṣad
RV Rgveda
VJ Vedāṅga-Jyotiṣa
ŚB Śatapatha-Brāhmaṇa