

## An Indic Text on Earth Science: Sasanian to Post-Sasanian Period

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### Abstract

Iran and India has an age old relationship from the historical period of Sasanian kings in Iran. The toponym 'Hindustan' appears in Zoroastrian Pahlavi texts as one of the most recognizable territories. *Dinkard* IV an important Pahlavi text has preserved an Indic scientific text on "Measurement of the Earth." The *Tarikh-e Gardizi* in the post-Sasanian period placed much emphasis on, "Measurement of the Earth Science", which is in similar format as the text referred to in *Dinkard* IV. The report of Gardizi as it is highlighted has not been seen by many scholars.

**Key Words:** Gardizi, India, Indic science text, Iran, Sasanian, Post-Sasanian.

### 1. INTRODUCTION

Historical relations between Iran and India date back to the remote past. The term "Indo-Iranian Languages" as one of the most important groups in the 'Indo-European' language category bears witness to such a claim (Akbarzadeh, 2014, p.1). In the era of Iranian ancient languages (1000-331 BCE) and in the inscriptions of Darius the Great (522-486 BCE), the term *hindav-* (Av. Hindu-) has been interpreted as 'on the upper Indus River' (Ken, 1953, p. 214).

In the middle Persian languages (331 BCE-651 CE), the toponym "Hindustan" with the help of Zoroastrian Pahlavi texts has been understood to be one of the most recognizable territories. Some of the Sasanian<sup>1</sup> kings had the toponym in their titles (Akbarzadeh and Tavusi, 2007, p. 152). In this period, especially in the late

Sasanian era, around sixth century CE, some Indian scientific texts (in Sanskrit) were translated into Pahlavi and later into Arabic by Indo-Iranian scholars (cf. Ibn Nadim, 2003, pp. 446-7, 486-7). In fact, the Sasanian period serves as a key bridge for Iran-India scientific relations. Indian scientists received high positions in Iran under the Sasanian kings, such as in hospitals and observatories. This influence is easily perceivable not only from Sasanian texts but also from post-Sasanian reports.

"*Dīnkard*"<sup>2</sup> gives information on how Shahpuhr the first ordered the collection of some scientific texts from India and Roma (cf. De Menasce 1958, introduction):

Shahpuhr son of Ardashir, King of Kings collected together, from Hindustan (India), Hrom (the Byzantine Empire), and other places where they had got scattered writings other than those of the faith (i.e. other than those on prayer, worship,

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<sup>1</sup> Sasanian ruled Iran in 224-651 CE. Pahlavi was the official language of the period.

<sup>2</sup> "*Dēnkard*" (lit., "Acts of the religion"), written in Pahlavi, is a summary of the Mazdean religion; the editor, Ādurbād Ēmēdān, entitled the final version "The *Dēnkard* of one thousand chapters." This version (was) described by Jean de Menasce on the title page of his translation (1958) as a "Mazdian encyclopedia". It was divided into nine books of unequal importance, but the first two and the beginning of the third are lost (Gignoux 1994, 284-289).

precepts, and law), (such as) those relating to medicine, astronomy, geography, minerals, the increase of the glory of the life-possessing kinds, the parts of the soul, and (writings relating to) other arts and sciences... (Peshotan Dastur Behramjee Sanjana 1900 (online)<sup>3</sup>.

Post-Sasanian texts (8-10 CE) also explain how Ardashir and his son, Shahpuhr, ordered the collection of scientific texts from Roma and India (cf. Safa, 2008, p. 95). In short, many post-Sasanian texts focus on India as the cradle of sciences. *Masudi* (2008, p. 564) writes that (Indic) mathematics, astronomy, medicine and armorology sciences are most popular among Indians.

## 2. DINKARD IV AND AN INDIC EARTH SCIENCE TEXT

*Dinkard IV* is one of the most important books of the *Dinkard* (Encyclopedia of Zoroastrianism). In previous scholarly works, the French Iranologist, J. De Menasce, paid meticulous attention to the text and made his valuable translation in which he mentioned (Menasce, 1958, p. 26) one of the Indic scientific texts as, *Measurement of the Earth Science*. The late Iranian scholar, Tafazzoli followed his master, De Menasce, and repeated same idea (Tafazzoli 1997, pp. 133-134). I emphasize that they have only mentioned the title but they never referred to post-Sasanian texts as a comparative work or the possibility that Muslim writers were familiar with the text<sup>4</sup>.

Pahlavi translation of Indic title ‘*nibēg ī zamīg paymānīh*’ meaning ‘measurement of the earth.’ It is the most important Indic text in

*Dinkard IV*, and may be held to be a handbook of ‘Earth Science, Earth Studies’ from Sasanian to the post-Sasanian periods. The title includes three known terms in the Pahlavi language: *nibēg* means ‘scripture, book’, *zamīg* ‘earth’ and *paymānīh* (inf. *paymūdan*) ‘measure’; (Mackenzi 1971, pp. 59, 67, 98). Unfortunately the original Pahlavi text was destroyed and *Dinkard IV* is the only source that has preserved this title.

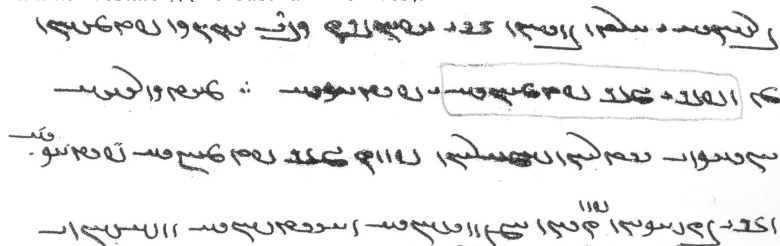
I believe that the text was so well-known as a handbook or a source in the field from Sasanian period to the early Islamic era that translators decided, most probably, to translate it from Sanskrit into New Persian or Arabic.

It is interesting that the *Tarikh-e Gardizi* (2005, p. 409), the most important Islamic text, under the chapter, Hindus/Indian sciences, gives a rare report about the Indic Earth Science which has never been seen and never compared with DK report:

“Indians are *wise* and *knowledgeable* people and many savants come out from among them. They have a variety of sciences and scientists. They are very professional in *medical sciences* like health control, elimination of diseases, maintaining freshness and... They are unrivalled in *mathematics, Measurement of the Earth science, Geometry, Astronomy*... also *music* and different *games*. They have many kinds of musical instruments...”

Gardizi stressed Measurement of the Earth Science (maybe as a field) which can recall the same narration of DK. Obviously the other fields of the report remind us of a valuable series of Indic scientific texts which were translated into Arabic and New Persian in the early Islamic era.

<sup>3</sup> www.Avesta.org (Zoroastrian Archives).

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In short, in both options (as a field or a proper book), we are able to find close similarities between report of DK and Gardizi's narration. In fact, the Indic Earth Science can be suggested as the most popular handbook among Arabo-Persian scientists, which refutes exaggerations of Western reports on how the Greco-Roman scientifically affected Iran (and the later Muslim world) in widespread fields of science!

### 3. CONCLUSION

Obviously India had affected Iran scientifically under the Sasanian kings. It seems that this influence is clearly discernible from the sixth century CE. One of the most important scientific influences is found in the field of the Earth sciences. In my view Greek and Syriac texts exaggerate in showing the wide scientific influence of Greco-Roman culture on Iran and one of the reason behind the claim can be the skilled workers who were captured by Shahpuhr I (cf. Shahbazi, online<sup>5</sup>). Meanwhile, Tabari (1996, p. 5368) mentioned in his book how Shahpuhr believed in Indian doctor(s) and not Roman ones. Harun-al-Rashid also rejected Bokhtisho the Christian doctor and replaced him with an Indian physician!

As a result, I cannot deny scientific relations with Roma under the Sasanian era through war or by Roman philosophers seeking refuge...In a case, such as that of the Earth Science, however, India affected Iran at least from the sixth century CE to the early Islamic periods when relations between the two countries were peaceful. I find support for my claim in *Dinkard*, Gardizi and Al-Biruni. Gardizi's report properly can be suggested as an equal to DK's report. The Indic text was known most probably in his time or it was a part of his sources. Meanwhile, the geographical area of *Tarikh-e Gardizi* can be included in the claim. That is to say that the author of the book has good knowledge about India, its culture, its boundaries etc.

The Indic Earth Science text can be an instrument to suggest the presence of Indian geologists in Iran during the Sasanian to the Early Islamic periods. History has confirmed how Indian scientists played a role in translating Indic scientific texts into Arabo-Persian languages but it is difficult to discuss the geologist translators' names due to lack of documentation.

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<sup>5</sup> www.Encyclopaedia Iranica