Communications of BAO, Vol. 73, Issue 1, 2026, pp. 135–139

Grigor Brutyan's Discovery of the Ancient Proto-Haykian Calendar of the Armenians (9th Millennium BCE)

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Abstract

A fundamental discovery made by the late astrophysicist and calendrical scholar Grigor Hambardzum Brutyan in the field of deciphering ancient Armenian calendars is briefly presented. Prior to his work, it was known that the Armenian calendar, inherited from the patriarch Hayk, consisted of a year composed of twelve 30-day months and five additional days known as "Avelyats" ("added" days). Through a detailed analysis of diverse ancient sources, he succeeded in demonstrating that an even older calendar had existed before it — a system which he termed the "Proto-Haykian" calendar. This discovery was later confirmed through the study of a material artifact dating to the 3rd millennium BCE — a polished clay vessel bearing impressed ornamental motifs. The "Proto-Haykian" calendar consisted of ten months of 30 days each, together with an additional transitional period of approximately 65–70 days that lay outside the principal calendrical cycle. In both calendrical systems, the principal annual festival was Navasard. It began with the heliacal rising of the venerated star, occurring seven days before the summer solstice — on June 14 in the modern calendar. The Proto-Haykian calendar was established in the 9th millennium BCE on the basis of the heliacal rising of Spica, the brightest star of the constellation Virgo, and was associated with the emergence of cereal cultivation. In contrast, the principal star of the Haykian calendar was Betelgeuse. In the Proto-Haykian system, the year commenced with the festival of Navasard, whereas during the supplementary period lying outside the formal structure of the year, the venerated star remained below the horizon and was therefore invisible in the night sky. In everyday social life, these days constituted a period associated with certain prohibitions and restrictions derived from mythological conceptions. In both the Proto-Haykian and Haykian calendars, the position of the principal festival, Navasard, remained fixed. The beginning of the year was likewise fixed in the former system, whereas in the latter it had already become movable.

Keywords: *Ancient calendrical systems; Haykian and Proto-Haykian calendars; Navasard festival; Armenian calendar; Archeoastronomy.*

1. A Brief Introduction to Grigor Brutyan's Study of the Armenian Calendar

Grigor Hambardzum Brutyan was born on June 28, 1955.This year he would have celebrated his 70th anniversary. After graduating from the Faculty of Physics of Yerevan State University with a specialization in astrophysics, he began working at the Byurakan Astrophysical Observatory in 1978. Initially, he focused on the observation and physics of variable stars and published several articles in this field. Starting in 1982, his scientific interests also turned toward issues of calendrical studies. At the Byurakan Astrophysical Observatory, the field of research on the history of Armenian astronomy and calendrical studies had previously been developed on the initiative of Viktor Ambartsumian through the works of Benik Tumanyan and Hayk Badalyan. Several monographs had already been written by them. Brutyan's calendrical studies were particularly devoted to the ancient Armenian Haykian calendar, as well as to the calendrical heritage of Anania Shirakatsi and Hovhannes Sarkavag. These studies were successively summarized in his three monographs:

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- The Calendar of the Armenians (1997),
- Anania Shirakatsi's "Kharnikhorran" (1998),
- The Chronological System of Hovhannes Sarkavag (1999).

He was also the author of the fundamental scholarly work that encompasses calendrical studies with encyclopedic breadth:

- Armenian Calendrics (2016).

In Brutyan's works, the numerous confused and often contradictory issues in the field of calendrical studies were thoroughly analyzed and brought into a unified and coherent framework, leading to a number of entirely new fundamental results. It is particularly important here to draw special attention to the estimate he obtained for the beginning of the Haykian calendar, determined through precise astronomical calculations — 2341 BCE. This age estimate, given from a temporal distance of more than 4,000 years, differs by only 151 years from the date proposed earlier by Ghevond Alishan -2492 BCE, and by merely one year from the estimate obtained by Mikayel Chamchian through the examination of historical and philological sources for the war between Hayk and Bel. At the same time, certain fundamental questions concerning the nature of the Armenian Navasard festival and the beginning of the New Year were also clarified. Through the analysis of the Haykian calendar and other related cultural materials, Brutyan also succeeded in uncovering the structure of an earlier calendar that had preceded the Haykian system. He conventionally termed it the "Proto-Haykian Calendar" and presented it in the article:

- On Certain Issues of the Armenian Calendar: The Structure of the Proto-Haykian Calendar, Etchmiadzin, 1996, Vol. 12, pp. 135–164

and was later summarized in the first of the above-mentioned monographs.

Figure 1. Grigor Brutyan

Brutyan established that, whereas the calendar inherited from Patriarch Hayk had a basic year consisting of 12 months of 30 days each, plus 5 additional days, known as "avelats" ("added" days) outside the basic year, the Proto-Haykian calendar comprised only 10 months of 30 days each as its basic year, along with an additional period of 65–70 days lying outside the basic year. In both calendars, the main festival of the year was Navasard, being an immovable festival beginning with the helical rising of the worshipped

doi: https://doi.org/10.52526/25792776-26.73.1-135

star, 7 days before the summer solstice, which corresponds in the present calendar to June 14. In the Proto-Haykian calendar, at the time of its founding in the ninth millennium BCE, the brightest star of the constellation of the Virgin (α Virginis) was worshipped, and by the 24th century BCE, the bright star of the constellation of Hayk (α Orionis), had become worshipped. In the Proto-Haykian calendar, the positions of the beginning of the year and the Navasard festival coincided, they were immovable, and were determined by direct observation of the star's helical rising.

In the Proto-Haykian calendar the main year began with the Navasard festival and during the days lying outside the basic year, the venerated star was located below the horizon, that is, it was not visible in the night sky. In the life of society, these days — stemming from mythological perceptions — constituted specific periods of restrictions. In the Haykian calendar the position of the main festival of the year, the Navasard, was also left unmoved, but the beginning of the 360-day cycle of the 12-month main year and 5 additional days outside it became mobile.

The discovery of the Proto-Haykian calendar, which resulted from Brutyan's examination of the calendrical sources in Armenian literature and of materials from folk tradition, later also received material confirmation. Indeed, archaeologists brought to Brutyan's attention a decorated clay bowl, known as Kreghan, dated to the third millennium BCE. After detailed investigations, Grigor Brutyan demonstrated that the Kreghan is in fact a material carrier of calendrical information. He presented the results of his many years of research in the following articles:

- Ancient Armenian Calendrical Concepts According to the Analysis of the Decorative Patterns of the Kreghan from the 28th–27th Centuries BCE, Bazmavep, 2007, pp. 149–163,
- The Beginning of the Armenian Proto-Haykian Calendar, Bazmavep, 2016, Nos. 3–4, pp. 11–63.

After that, Grigor Brutyan summarized the results of his research on the Armenian calendars in a concise yet systematic form in the semi-popular monograph published by the Byurakan Astrophysical Observatory,

- The Armenian Calendar from Its Origins to the Present (2018).

This book was intended for students and specialists interested in the history of Armenia and the development of its calendars.

He later presented the complete scientific decipherment of the Khreghan calendar in his still-unpublished, extensive monograph entitled

- The Early Bronze Age Armenian Calendar According to the Decorative Patterns of the Kreghan from Keti.

As the editor of that book, I will present — with minor modifications — an excerpt from the "Editor's Preface" placed at the beginning of the monograph, where a concise yet substantive outline of this fundamental work is given.

2. Excerpt from the Editor's Preface to Grigor Brutyan's Then-Unpublished Monograph

The reader is presented with the late Grigor Hambardzum Brutyan's sixth and final monograph, which is the fruit of more than twenty years of his scholarly research. During his lifetime, he prepared the book for publication three times — in 2007, 2011, and 2016 — yet never had the opportunity to see it realized. In the meantime, up until his passing on April 11, 2021, Grigor Brutyan continued to enrich the study with new results, revealing further essential aspects of the problem. The version of the book now presented is the copy that Brutyan last prepared for publication in 2019 and revised in 2020.

The book is devoted to the study of one of the two groups of decorative patterns on the Kreghan, a black-burnished ceramic vessel from the Early Bronze Age (33rd–30th centuries BCE), preserved in the Shirak Regional Museum. The Kreghan was discovered in 1974 in Shirak, in Tomb No. 8 of the Keti burial ground, and belongs to the Shengavit (Kura–Araksian) culture. The artifact was presented to Brutyan in 1987 by the museum's director, Hamazasph Khachatryan. He initially expressed this view orally, and in the 1990s also published an article suggesting that the decorative pattern apparently had a calendrical significance. It

doi: https://doi.org/10.52526/25792776-26.73.1-135

is incised on moist clay by means of impression and includes several distinct symbolic designs. Among them are arranged 365 dot-like marks. The examination and interpretation of the decorative pattern by Brutyan were carried out in several stages, each of which required approximately a decade of research work.

1) In the first stage, the initial assumption — that this was indeed a calendar — was confirmed, and the fundamental structure of that calendar was established. It was revealed that the overall structure of this calendar was similar to that of the "Proto-Haykian" calendar, which Brutyan had previously discovered by an independent line of research through the study of Armenian literary sources, folklore, and other cultural evidence.

2) In the second stage, a detailed examination of the individual motifs of the decorative pattern was carried out. A wide range of Armenian cultural materials was employed — including mythology, epic poetry, folktales, ethnography, archaeology, archaeoastronomical knowledge and concepts, as well as megalithic monuments. During this stage, the meteorological, botanical, zoological, and geographical characteristics of the Armenian natural environment were also taken into account. By comparing this rich body of material, and when necessary, examining the surviving fragments of the cultural heritage of neighboring peoples, Brutyan was able to reconstruct in detail the internal structure of the calendar impressed on the Kreghan. As a result, the reconstructed structure of the Kreghan calendar was presented in the form of a table, using the dates of the modern Gregorian calendar.

Figure 2. Kreghan

3) The third stage was devoted to the correlation of the surviving Armenian day names and month names, and a thorough logical analysis clearly demonstrated the direct identity of the two calendars — the Kreghan calendar and the Proto-Haykian calendar.

4) In the fourth stage, he was able to determine the starting point of the Proto-Haykian calendar with an accuracy of only 80 days. It was found to have begun with the solar rising of Spica, the principal star of the Virgo constellation (whose name in Armenian means *"Ear of Grain"*), occurring seven days before the summer solstice in 9000 BCE, and was associated with the onset of grain-sowing practices in society.

Thus, it became clear that the vessel itself, as a material carrier of the calendar, dates to the late 4th millennium BCE, yet it has nevertheless preserved information about a calendar originating as far back as the 9th millennium BCE.

The basis of Brutyan's decipherment was:

- the discovery of a meaningful connection between the process of grain sowing and the traditional meanings of the names of a certain group of constellations, as well as
- the discovery of the essence of the main Armenian festival, Navasard, as a holiday connected with the summer solstice, the ripening of autumn-sown wheat, and the start of the year.

In the course of his investigation of the problem, Brutyan also made extensive use of certain features related to the geology, fauna, flora, and climate of the Armenian Highlands, drawing on the well-known results of distinguished domestic and foreign researchers in these fields.

Truly, one can be amazed by the wide range and depth of Brutyan's knowledge, by the skill and clear reasoning with which he used it, and by the remarkable persistence he showed in solving the problem. In his calendrical studies, Brutyan consistently applied the concept of the so-called "inverse problem". Such an approach directly stems from his training in physics and mathematics. The idea of the "inverse problem," as the great Viktor Ambartsumian noted—having applied it widely in his fundamental astrophysical research—traces back to Johann Kepler and Isaac Newton. In this approach, true understanding is achieved by keeping away from, as much as possible, any initial pre-assumptions, even widely accepted views and assumptions. In the process of scientific research, one proceeds only from a detailed and careful analysis of the available reliable facts (the observed regularities), includes only indisputable truths, and, when necessary, includes additional relevant information from other fields. On this basis, building a realistic line of reasoning, one proceeds step by step from the observed effect toward the underlying cause of the phenomenon under study.

Brutyan's working style is consistent with this approach and can serve as a practical guide for research work in the field. It is not by accident that Hayk Malkhasyan, a researcher of the Department of Historical and Cultural Astronomy headed by Brutyan, has achieved remarkable progress in recent years by continuing the archaeoastronomical investigations at the Zorats Karer complex that he had begun together with Brutyan. As a result, Brutyan's interpretations concerning the Kreghan vessel and the Proto-Haykian calendar were not only practically validated and refined, but also shed new light on the understanding of Navasard — the ancient principal holiday of the Armenians.

It is important to note that the knowledge obtained at Zorats Karer concerning astronomical observation instruments, the mythological perception of celestial bodies, and the ancient calendrical culture has already assumed the role of a cornerstone in the field of studying renowned monuments and cultural heritage attributed to later periods in other parts of the world.

The present monograph further incorporates a comprehensive overview of the author's scholarly legacy, prepared at my request by Hayk Malkhasyan, Head of the Department of Cultural Astronomy at the Byurakan Astrophysical Observatory, and dedicated to the memory of the late Grigor Hambartsum Brutyan.

3. Conclusion

The discovery of the Proto-Haykian calendar by Grigor Brutyan, the detailed decipherment and verification of its structure through the study of the ornamentation of a Bronze Age ceramic calendrical artifact, and the determination of the epoch of its origin constitute a major achievement in contemporary Armenian calendrical scholarship.