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Larchemi/Soinari – The Georgian Panpipe

ABSTRACT

This article focuses on the panpipe, one of the ancient instruments of the Georgian traditional instrumentarium. Some Georgian traditional instruments remain popular today, with playing and construction techniques still preserved. Others, however, have disappeared from everyday life and stage folklore. Today, an instrument considered as one of the most ancient Georgian traditions – the panpipe, which we can discuss based on documentation and materials from the first half of the 20th century – is among those that have disappeared from everyday life.

The article aims to collate information about the instrument from different works by various researchers, and also to study its organological, ethnographic and musical features. It offers in-depth analysis of audio recordings and notated scores from fieldwork expeditions of the 1930s and 1950s.

Nowadays, there are some attempts in the regions as well as in the capital of Georgia to restore this instrument, although construction and repertoire are significantly different from the traditional forms.

KEYWORDS

Georgian Panpipe

Larchemi

Soinari

Georgian folk musical instruments

Georgian traditional instrumentarium

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Introduction

The Georgian panpipe was widespread throughout the territory of historical Colchis, particularly in Samegrelo, where it was known as *larchemi* (in the Jvari and Khobi area) and Guria, where it was known as *soinari*/*solinari* (in the Chokhatauri region, figure 1). We have proof that a panpipe known as *ostvinoni* existed in Lazeti too[1]. In addition, the instrument may have spread into Abkhazia and Kvemo Imereti (Rosebashvili, 1960: 49); however, there is no concrete proof of this in the sources[2]. Two other terms meaning 'panpipe' have been recorded in the literature: *sastsrapo* (in English: the urgent, in Samegrelo), which means 'gunpowder flask' (Steshenko-Kuptina, 1936: 55-56), and *sastvinveli* (whistling) (Alavidze, 1978: 83; Orbeliani, 1993: 55).

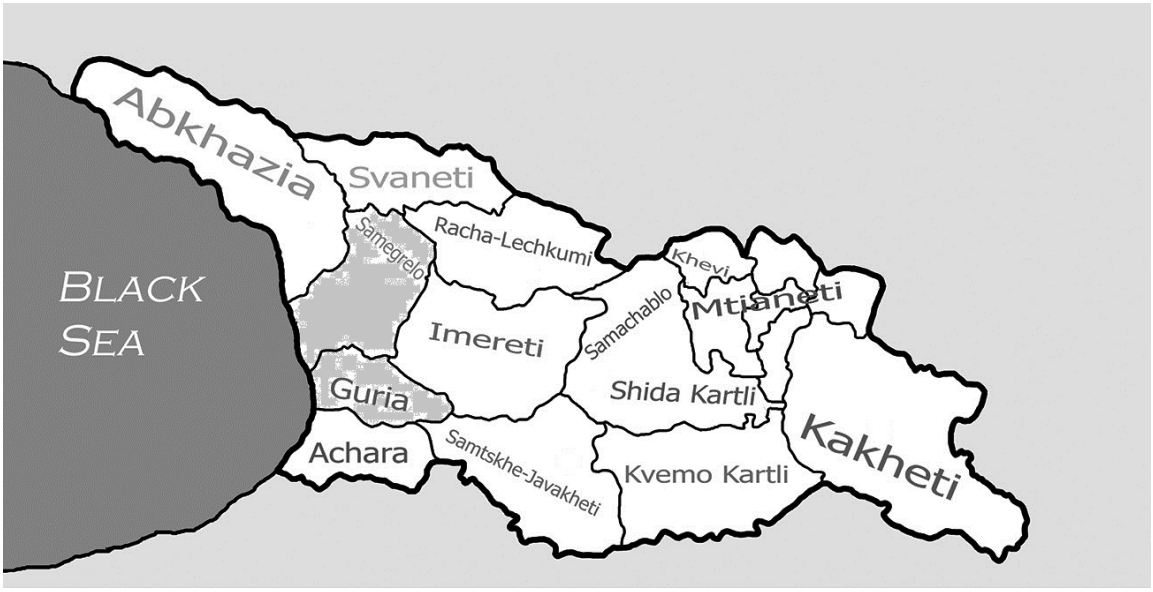


Figure 1. The map of Georgia.

A number of Georgian researchers have written about the Georgian panpipe (D. Arakishvili, I. Javakhishvili, V. Steshenko-Kutpina, S. Makalatia, K. Rosebashvili, O. Chijavadze, M. Shilakadze, G. Simvulidi, N. Mshvelidze, T. Zhvania, I. Zhghenti, etc.). The most important works are those of V. Steshenko-Kuptina (1936), D. Arakishvili (1940) and K. Rosebashvili (1960, 1975, 1981, 1985, 1986). In addition, a very important ethnographic report is given by Sergi Makalatia (1941). Musical materials are analyzed

[1] The existence of the panpipe in Lazeti is confirmed in one source only (Steshenko-Kuptina, 1936: 36, 153).

[2] K. Rosebashvili has noted that the larchemi was used in the ritual to "catch the soul" of the dead in Abkhazia, as well in Samegrelo (Rosebashvili, 1960: 51). We must note that there is only one village, Kokhnari, where the soinari was recorded. The village borders Imereti, hence the instrument may have existed in this region as well.

by Valentina Steshenko-Kuptina (1936: 231–237), Giorgi Simvulidi (1978: 34-45), Tinatin Zhvania (2006: 24–41) and Ivane Zhghenti (2016: 103–123). To date, there is only one scholarly article available in English (Mshvelidze, 2003), together with a short entry in the *Grove Dictionary of Musical Instruments* (Chkhikvadze, 2014: 20; Razmadze, 2014: 260-261).

Since the instrument has disappeared from life in the villages, we have to be satisfied with the reports about its role in traditional everyday life, the technology of construction, the nature of ensemble playing, and other features provided by the authors mentioned above. Fieldwork expedition materials – in particular, audio and score samples – are provided by Mshvelidze (*soinari* – 1931), Steshenko-Kuptina (*larchemi* and *soinari* – 1936), Chijavadze (*larchemi* – 1959) and Rosebashvili (*larchemi* – 1958; *soinari* – 1959); in total, there are 21 scores and 24 audio samples. There are 34 different items represented among the 45 samples; 11 score samples match the audio versions (see the list of score and audio examples below).

There are a number of legends about the origins of the panpipe. The most popular is the legend about the Greek god Pan. Another Greek myth is interesting, telling us about the king of the Georgian tribes, Mita: "In the 8th-7th century BC, in the Mushki (Meskhi) kingdom, great musical spectacle competitions were held. Mita, the King of Mushki, was himself considered to be the creator and disseminator of the panpipe, and also the supporter and referee of those playing it" (Janelidze, 1965: 50).

A Hittite bas-relief showing an image of a man in *chokha* (traditional Georgian costume) with wheat and panpipe (figure2, Steshenko-Kuptina, 1936: 64-65)[3], allowed the researchers K. Rosebashvili and T. Zhvania to confirm that in ancient times tribes related to today's Georgians had the panpipe (Rosebashvili, 1960: 50; Zhvania, 2006: 27).

[3] V. Steshenko-Kuftina bases on the French publication – Perrot et Chiptez. Histoire de l'art dans l'antiquitê, vol. IV, p. 561. The reseracher notes that the bas-relief dates back no earlier than VII-VIII centuries.

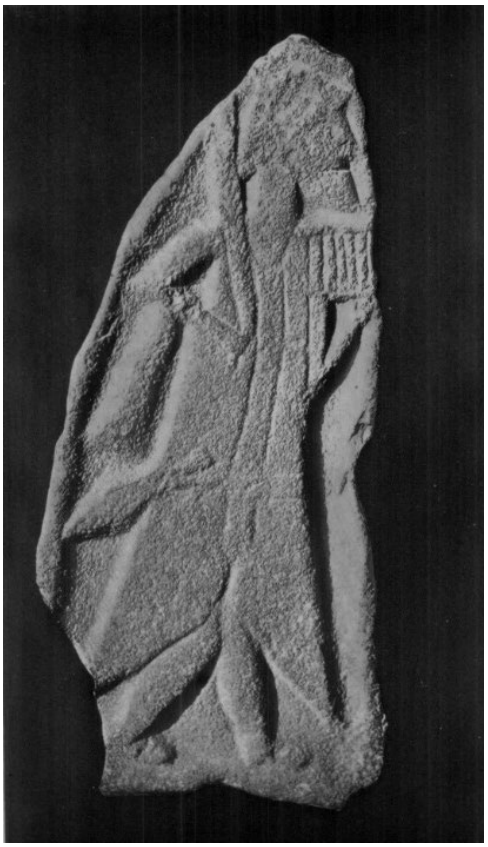


Figure 2. Hittite bas-relief from Roum-Qalah (Стеценко-Куфтина, 1936: 64).

The 2nd century mosaic figure of Pan playing the panpipe, discovered in Dzalisi near Mtskheta, is interesting, since scientists think it may be the *ochopintre* (*ochokochi/ochopintre* (Georgian: goatman) playing the *salamuri*/flute (figure 3, Chikhladze, 2013: 88).

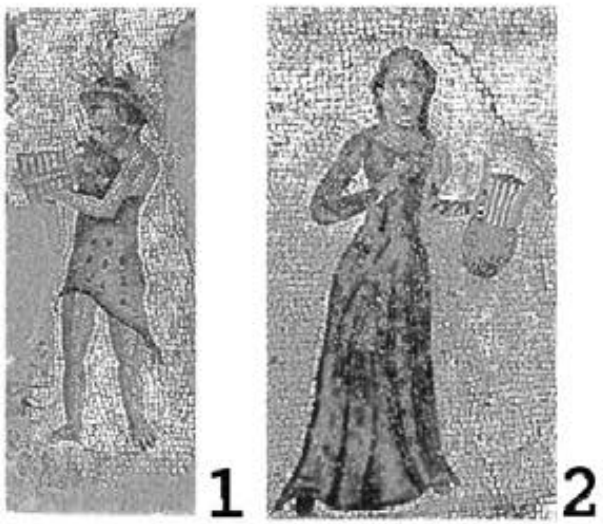


Figure 3. The mosaic figure of Pan playing panpipe and a woman with a lyra. 2nd century AD (Chikhladze, 2013: 88).

But, since, first of all, the *ochopintre* is not an Eastern mythological character even though discovered near Mtskheta, and, secondly, the main images on the colorful mosaic of the temple-palace are Dionysus, Ariadne and a woman with an instrument similar to Greek lira (Chikhladze, 2013: 70), this may be the Greek Pan, not the Georgian *ochopintre*.

I. Zhghenti and M. Shilakadze make a very interesting point about the human figure playing a double-pipe musical instrument depicted on the golden hanger in the 'Khaishi treasure' discovered in Svaneti (Zhghenti, 2016: 106; Shilakadze, 2007: 36). Dating from the 1st-2nd centuries AD (figure 4, Javakhishvili, 1958: 155), the golden hanger was considered to be the production of a local workshop (Chikhladze, 2013: 90).

Figure 4. 'Khaishi treasure' discovered in Svaneti. 1st-2nd century AD (Copyright the Georgian National Museum).

I think this instrument is more similar to the Greek aulos than to the panpipe. Discovering an instrument similar to the Greek aulos in Svaneti is to be expected, because some centuries before this period, there is evidence of Greek colonies and influences in the region.

Nomenclature for the Instrument

Four out of five names for the Georgian panpipe (*larchemi*, *soinari*, *ostvinoni*, *sastvineli*, *sastsrapo*) originated in Georgia.

Apparently, literary sources refer to it as *soinari/solinari*. Sulkhan-Saba Orbeliani (17th century) defines the meaning of *solinari* in his Georgian language dictionary[4]; also, to describe the process of playing panpipe by musicians in the work *Traveling in Europe*, he uses the term *soinari* (Orbeliani, 1940: 50). It is important that this tendency also shows itself in the scientific literature. For instance, D. Arakishvili the term *soinari* used to define Gurian and Megrelian panpipes (Arakishvili, 1940: 5-8; translation by Gr. Chkhikvadze). *Soinari* is a Greek word (σωλήν, σωληνάρι / solin, solinári) and means 'water pipe' in Georgian (Orbeliani, 1993: 165).

It is extremely interesting that in the 11th century work by Basili of Caesarea, '*Hexaëmeros*' (Six Days of Creation), translated from Greek into Georgian by Giorgi Mtatsmindeli, the term *solinari* is defined as panpipe (Abuladze, 1964: 42).[5] In the original Greek, to explain the arrangement of celestial bodies the talk is about twin vessels put together– '*τῶν κάδων*' (dishware, vase, small barrel – in the plural).[6] Instead of twin vessels Giorgi Mtatsmindeli apparently uses the name of the instrument – Solinari, disseminated in Georgia at the time. So the term has not been directly translated but replaced with its Georgian analog – familiar to Georgians with its local name.

The term *larchemi* means arundo (giant cane plant) in Megrelian. Indeed, in mountain areas of Samegrelo there are species of this plant named *larchema* used as material for making the instrument.

So far we have only one source about the panpipe (*ostvinoni*) spread in Lazeti provided by Iskander Tsitashi (İskender (Alexander) Chitaşi) (Steshenko-Kuptina, 1936: 36). Other researchers (Rosebashvili, Shilakadze, Mshvelidze, etc.) refer to the notes of Steshekno-Kuptina about the Laz *ostvinoni*.

[4] "Stvirni shetskobit shetsebulni" (Orbeliani, 1993: 166).
[5] http://titus.uni-frankfurt.de/texte/etca/cauc/ageo/bascaes/baskes6d/basket.htm
[6] I wish to thank Ketevan Matiashvili, who helped me find and translate the text.

On the one hand, the term *ostvinoni* can be connected to ancient Greek (in the standard ancient Greek-Russian dictionary *ὁστέον/osteon* is defined as a bone, and the use of the term to indicate bone flutes may have originated from that (Dvoretski, 1958: 1200);[7] on the other hand, it sounds like the Georgian word *stvena* (whistle); most Laz informants defined *ostvinu* as 'sliding' (for example, ice sliding, skiing, etc.)[8], while others recalled its ancient meaning, whistling[9], although they did not confirm the existence of a pan-like instrument in Lazeti. There is a note by the young researcher Giorgi Kraveishvili that Laz consultants Narime Helimish and Muhittin Memişoğlu confirmed the existence of the *ostvinoni* in Lazeti (Kraveishvili, 2011: 126). In private conversation with the researcher I have verified that neither of these informants remembered the term *ostvinoni* (hence, the term used here is chosen by the author), and the researcher could not determine which instruments they were talking about – panpipe or *tulum* pipes (widespread among the Georgian population living within the territory of Turkey, and significantly different from the panpipe) (Saygun, 1937: 47[10], Figure5). For now, the existence of the *ostvinoni* in Lazeti cannot be confirmed without more evidence.

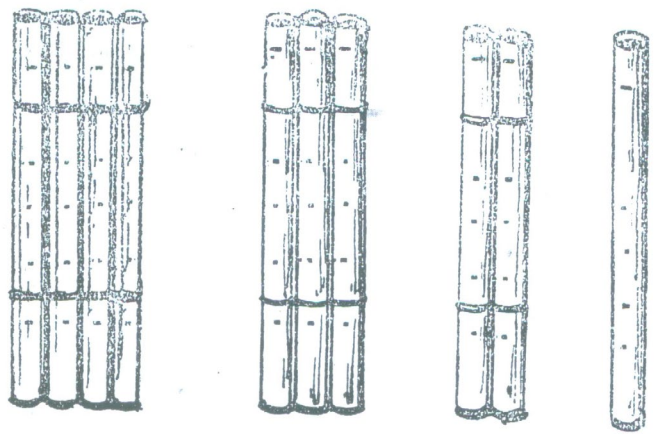


Figure 5. Pipes of *tulum* (*chimoni*) (Saygun, 1937: 47).

The local term *sastvinveli*, meaning Georgian panpipe, is mentioned in old Georgian translations of the Bible. D. Alavidze considered it the analog of the Laz *ostvinoni*

[7] I wish to thank Ketevan Matiashvili, who helped me work with the dictionary.
[8] I checked the information in a contemporary Laz-Turkish-English e-dictionary, where the same definition is given: ostvinu//kaydırmak//to slide, to be swift http://www.nenapuna.net/
[9] Muhsin Senturk, 1953; Laz dictionary: http://www.ice.ge/liv/liv/lazur.php. See: *osthvinu* (whistle), *ostvinu* (whistle), *stvinei* (with whistling), *nostvine* (whistled), etc.
[10] I am grateful to Abdullah Akat for providing me with this source.

(Alavidze, 1978: 83). According to Sulkhan-Saba Orbeliani these were "pipes (3, 7 Daniel)" (Orbeliani, 1993: 55).

I am curious as to whether the variety of instruments' names just reflects differences among dialects, or is evidence that these instruments were different from each other in terms of their construction, tunes and repertoires. Unfortunately, we can only discuss this question based on the sources we have concerning mutually shared and different characteristics between the Megrelian *larchemi* and the Gurian *soinari*.

Materials and Construction

The traditional way to make the panpipe was to use an *arundo* or *larchema* as the material of construction. *Larchema* is an arundo-like plant but notably different from it. It grows as a long thin stem, 10-12 millimiters in diameter. Inside the stem, there are sections separated by dividers, used to make the pipes of the instrument (Rosebashvili, 1985: 15). According to the Megrelian and Gurian masters, a *larchemi* made from an arundo does not produce a good sound, and playing it is not too satisfying (Makalatia, 1941: 256; Sharashidze, 2014: 86).

Besides arundo, Gurians used an arundo-like plant called the 'soinari bush' to make *soinari* (Sharashidze, 2014: 86).

The suitable time for cutting the material and making the instrument was the end of July, August and September. At that time the material is raw and does not crack even after being used for a long time; also, its voice is better (Makalatia, 1941: 256; Rosebashvili, 1985: 15). According to Steshenko-Kuptina, *larchemi* or *soinari* are made from one stem of arundo. The maker starts cutting from the bottom. The layout of the pipes has a shape of a rhombus that is cut into half; two bass pipes are the longest and are sandwiched in the middle, while the shorter ones are located on the sides. First of all, the maker cuts two bass pipes, then he cuts pipes one after another and tunes the sections to appropriate intervals of a third (Steshenko-Kuptina, 1936: 229). While cutting the pipes of *larchemi* there are no preset standards—a maker checks his progress aurally (Steshenko-Kuptina, 1936: 207).

The pipes arranged in a row are tied with the bark of a young cherry tree (Megrelian: *khrali*, *balishi sartkeli* [in English: pillow girdle]; Gurian: *sartkeli* [in English: girdle])

(Steshenko-Kuptina, 1936: 208; Makalatia, 1941: 257; Rosebashvili, 1960: 50; 1985: 16). According to the note by Nona Kobalia, to bind the pipes, cannabis or other tree barks were used[11].

Larchemi and *soinari* were traditionally carried hanging round the neck with a ribbon loop (Megrelian: *ghina*, *bunapali*) (Steshenko-Kuptina, 1936: 210, image III; Rosebashvili, 1986: 18).

Construction

Number of pipes and layout

Researchers note a difference in size between the Gurian and Megrelian panpipes – the Megrelian panpipe is bigger compared to the Gurian (Steshenko-Kuptina, 1936: 208; Shilakadze, 1970: 19). However, according to Rosebashvili, there were two kinds of *soinari*s with different sizes in Guria –one small and the other even smaller, the so-called pocket *soinari*, which was played at nights while travelling (Rosebashili, 1985: 17). In addition, analysis of the sound frequencies from the audio recordings by Sh. Mshvelidze (1931) proves that there existed Gurian *soinari* of the size of the Megrelian *larchemi*.

According to the specimens and documentation available to us today, Georgian (Gurian and Megrelian) panpipes were usually made from six closed pipes. The longest two pipes are located in the center, the others - sideways according to length (figure 6).

[11] https://www.youtube.com/watch?v=3QrOpHbpF3w

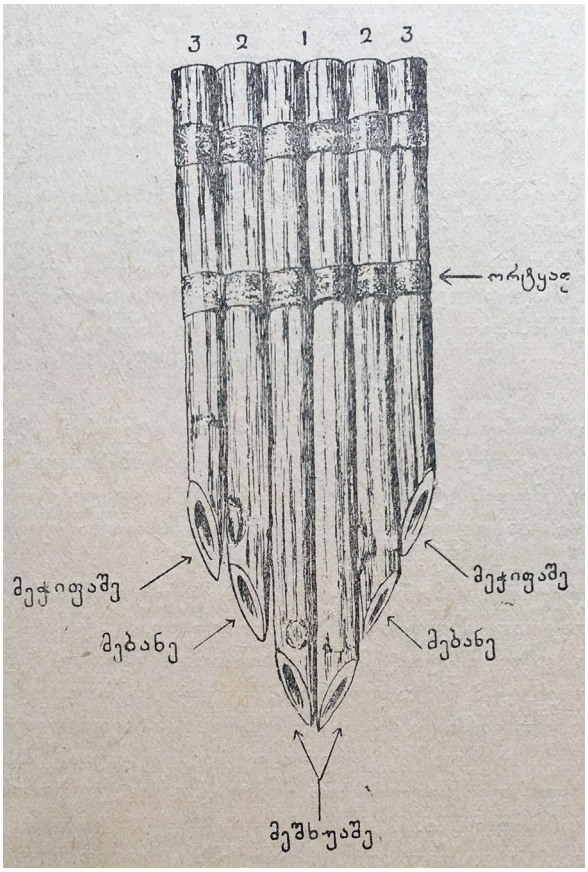


Figure 6. Six-pipe Georgian panpipe (Makalatia, 1941: 256)

V. Steshenko-Kuptina noted that the pipes of this construction could be a very rare, or perhaps, only kind of the panpipes disseminated throughout the world (Steshenko-Kuptina, 1936: 208; Rosebashvili, 1960: 50-51).

According to S. Makalatia, a five-pipe panpipe was extant in Samegrelo (in Khobi). Unlike six-pipe instruments, this one had pipes located next to each other in order of length (figure7). Unfortunately, we have no information about its tuning or repertoire (Makalatia, 1941: 255–259).

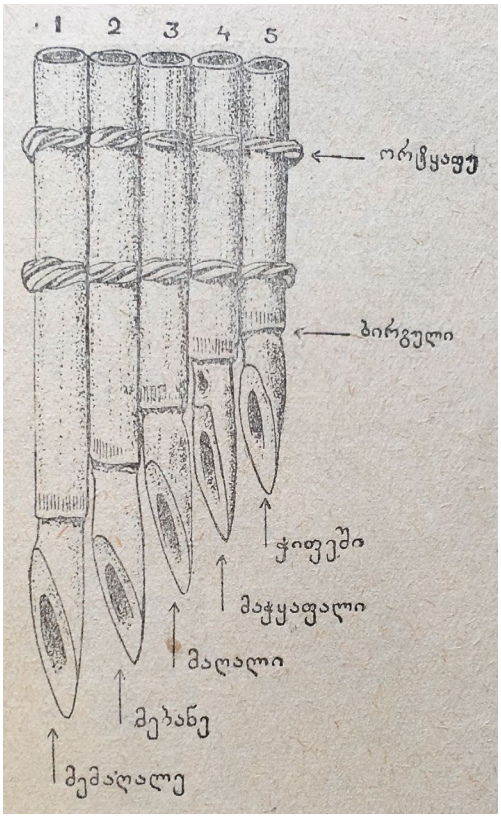


Figure 7. Five-pipe Georgian panpipe (Makalatia, 1941: 257)

Interestingly, sometimes when playing Megrelian repertoire on six-pipe *larchemi*, performers use only five out of the six pipes. Names of the pipes of Georgian panpipes, whether there are five or six pipes present, are somewhat similar, and the pitches and functions of the 1st, 2nd, 3rd, 4th and 5th pipes on the five-pipe flute correspond to those of the 4th, 3rd, 5th, 2nd and 1stpipes on the six-pipe flute.

V. Steshenko-Kuptina found some indication of the presence of instruments with seven and twelve pipes existing at some point in Lazeti, although she could not prove it with any certainty (Steshenko-Kuptina, 1936: 183).

Names of pipes in Samegrelo and Guria

Different researchers have recorded the names of the pipes of the Megrelian *larchemi* and Gurian *soinari*, which sometimes significant differ from each other (tables 1 and 2).

Table 1. Pipe names of Megrelian *larchemi*

	Steshenko-Kuptina			Makalatia		Rosebashvili			Kobalia	
The number of pipe [12]	The number of pipe	Name		The number of pipe	Name	The number of pipe	Name		The number of pipe	Name	
1	6	mechipashe	ukulashi (smaller), left side	3	mechipashe	1	mechipane	Right side	[6]	gumorduli	Short pipes
2	4	gemachkapali		2	mebane (bass)	[2]	mebane, bani (bass)		[4]	mechipe, mechipeshi	
3	2	mebane (maghali bani (high bass), mtavari bani (main bass), didi bani (great bass)		1	meshkhuashe	3	meshkhuashe, Gemachkapali (beginner)		2	mebane, chipeshi, chipebanishi	
4	1	mebane (meore bani (second bass), patara bani (small bass)	umosi (bigger), right side	1	meshkhuashe	[4]	meshkhuashe, gemachkapali	umosi (bigger), left side	1	mebane, shkhushi, shkhubanishi	Long pipes
5	3	gemachkapali, gemachkapuri (beginner)		2	mebane (bass)	[5]	mebane, bani (bass)		[3]	gochipeshi, gopsha	
6	5	mechipashe		3	mechipashe	[6]	mechipane		[5]	gemachkepuri	

Table 2. Pipe names of Gurian *soinari*

	Steshenko-Kuptina, 1			Steshenko-Kuptina, 2		Rosebashvili		
Pipe number [13]	The number of pipe	Name		Pipe Number	Name	Pipe Number	Name	
1	6	Sixth voice	Left side	6	modzakhili, krimanchuli	[1]	krimanchuli	Right side
2	4	Fourth voice		4	gadatanili	2	High bass	
3	2	Small bass		2	sashualo	3	Low bass	
4	1	Great bass	Right side	1	bani (bass)	3	Bass	Left side
5	3	Third voice		3	tskeba	2	Second voice	
6	5	Fifth voice		5	modzakhili	[1]	krimanchuli	

[12] Numbered by the author (N.R.).
[13] Numbered by the author (N.R.).

According to different researchers, bass pipes, which are the longest, were sometimes located in the middle, and sometimes second and forth in the row, next to the middle pipes. In the repertoire available to us, the bass function is allocated to the 3rd and 4th pipes, not the 5th or 2nd. I think there is a mistake in Makalatia's records, repeated by K. Rosebashvili and O. Chijavadze. Bass pipes are named as middle pipes by Rosebashvili in his research: "If we start counting from the middle or the bass pipe […]" (Rosebashvili, 1960: 52).

Numbering of pipes

Understandably, different Georgian researchers number the pipes of the *larchemi* and *soinari* in different ways (tables 1 and 2). V. Steshenko-Kuptina numbers the pipes corresponding to their pitch, so that the longest pipe is #1. In S. Makalatia's numbering system the *larchemi* is divided into two parts, and the numbering principle also depends on the pitch sequence of the pipes. A perception of the two parts of the instrument is evident in folk terminology as well, when the performers report to us the terms *umosi* and *ukulashi* (these terms are defined below). His numbering of the *soinari* pipes is different and, like S. Makalatia's numbering system, is based on the division of the instrument into two parts (3-3).

In fact, Steshenko-Kuptina, Makalatia and Kobalia deal with the numbering of pipes by starting from the longest and counting up towards the shortest, while by Rosebashvili starts from the shortest pipe, according to the layout. As for the five-pipe *larchemi*, in Makalatia's research the numbering starts from the longest pipe counting up towards the shortest one as well (tables 1 and 2).

According to popular international practice, each separate pipe of the panpipe is identified either with numbers or with the Latin symbols for the pitches. I have found two versions of numbering: in the first version, pipes are numbered according to their pitch, with the longest counted as #1 (Civallero, 2014: 249); in the second, pipes with different pitches are numbered according to the sequence that corresponds to the tuning of the instrument (Civallero, 2014: 257).

When numbering the pipes, I have adopted the principle of K. Rosebashvili, to number the pipes strating with the shortest one in sequence. This is because numbering according to the sequence seems to be convenient for notation, and the analysis of the

audio material has shown that performers usually used to play the shorter trio, rather than the long pipes. Furthermore, sometimes performers did not use the 6th pipe.

Dividing the sides of the instrument into left and right sides was also approached differently by V. Steshenko-Kuptina/Arakishvili and Rosebashvili; For V. Steshenko-Kuptina/Arakishvili the left side is *ukulashi*, but for Rosebashvili it is *umosi* (Megrelian: senior, long-piped). The first approach indicates the left and right sides from the point of view of the observer, while the second speaks from the position of the performer. In this case, I prefer the position of K. Rosebashvili, because the right side probably was *ukulashi* for the performer.

Performing Technique and Notation

We have very little information about the features of traditional performance on the *larchemi* and *soinari*. Unfortunately, because there is no video documentation, there is no way to recapture some aspects of performance, although studying the tunings and the audio and score samples allow us to define some features.

Performers simultaneously blow the 6th-5th, 5th-4th, 3rd-2nd, 2nd-1st and 3rd-2nd-1st pipes. They do not use 4th-3rd (bass) pipe combination. While using pipes sequentially, they mostly use side pipes. Long distance intervals are rare, for instance, from the 3rd pipe to the 1st and vice versa, or 1st-2nd pipe to the 5th-6th ones.

In the samples of 'Nirzi'[14], the performers sequentially blow pipes (one each) located side by side (for example: 2123232321232... Steshenko-Kuptina, 1936: 275), or one performer blows two adjacent pipes and the other blows each of the adjacent pipes (audio instrumental piece, #22). In other words, for the most part, performers, actually, blow the neighbouring pipes. Blowing the outer pipes and skipping the middle one is quite rare (for example, 123332**13**23**13**233332123... audio instrumental piece, #22).

As the musical analysis shows, the performers on the recordings from the 1930s were intensively mastering all of the six pipes, while in the recordings from the1950s they were using 5 pipes out of 6. In both sets of recordings the side of the instrument with the short pipes is more actively used by performers.

[14] A musical competition where two performers play the same instrument by dividing pipes, three each, described in detail below.

Playing intervals and chords can be achieved by blowing pipes simultaneously, as well as separately. Each pipe produces one pitch; the pitch does not shift by raising and lowering the pipe end, or by changing the sound length.

Steshenko-Kuptina notes that there is a very remarkable way of playing the panpipe: performers press their lips tightly against gaps between the pipes, blowing into two pipes simultaneously so that the interval of a third is played. Getting equally full and precise sounds from both pipes is dependent on the performer's breath technique (1936: 208-209). This technique of playing the six-pipe *salamuri* was not shown in the audio recordings. It is worth noting that because of the different construction, in order to perform the repertoire available to us, a five-pipe *larchemi* would be necessary– there are many intervals of a third, so closing the middle pipe would be closed using one's tongue.

M. Shilakadze noted that the design and construction of the instrument was related to the tradition of polyphonic performance (Shilakadze, 1970: 70). Indeed, the afore-mentioned performance manner is quite uncomfortable to create polyphony, and maybe, getting this kind of sound with a less complicated playing technique became the prerequisite for making the instrument with an original construction. It is worth noting that the Ecuadorian *rondador*, the only one of the world's panpipes I have found on which two-voice music is played, also has an unusual construction[15]. In different cultures (Peru, Russia, etc.) polyphony is achieved in ensemble performance, when several performers play simultaneously.

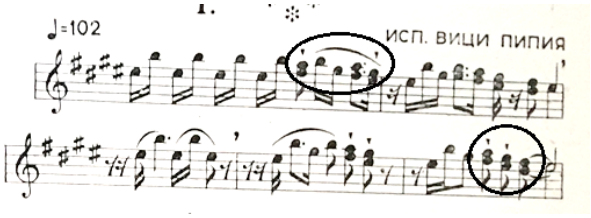
It is difficult to know which side of the instrument was considered the right side from the perspective of the performer without video sources. Also, if we take the sequence of the pipes into consideration, when showing the tuning of the instrument, supposedly, the side named *umosi* (named by Steshenko-Kuptina) would be the left side.

Notated sources are provided in the works by Steshenko-Kuptina and Rosebashvili; the former researcher uses optional notes for some features (score example 1), while the latter does not. Taking the international practice into consideration, I think that marking

[15] I would like to thank researchers Edgardo Civallero and Rūta Šimonytė-Žarskienė for information and consultation.

the pipes with numbers provides crucial information, and thus I do this in my own notation examples.

a)



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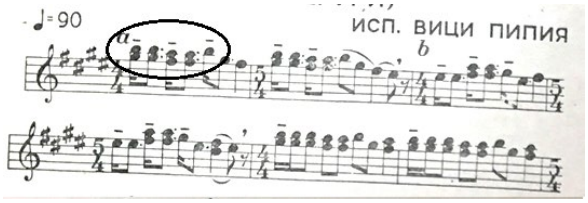
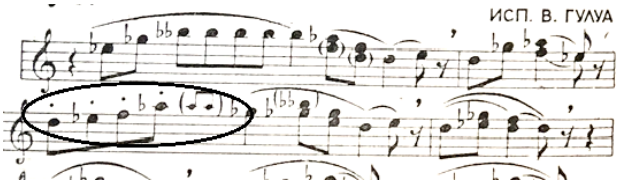


c)

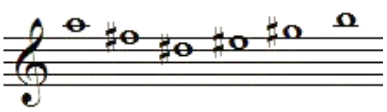


Score example 1. Notated sources with optional notes (Steshenko-Kuptina, 1936: 273, 274, 276).

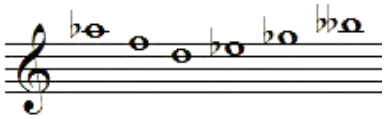
Tuning

In the audio and notated sources of the Georgian panpipe available to us, 21 tunings are recorded. There are nine notated tunings of the *larchemi* (score example 2: 1-9) and three of the *soinari* (score example 4: 10-12), though in audio recordings there are four tunings of the *larchemi* (audio examples 8, 14, 18, 22) and three of the *soinari* (audio examples 1, 5, 25). Also, there are other tunings for each instrument that are not recorded separately, although they are evident from the playing (audio examples 7, 30).

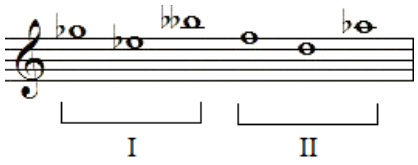
2.1. Steshenko-Kuptina, 1936: 273



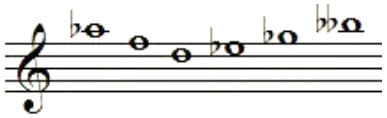
2.2.a. Steshenko-Kuptina, 1936: 275



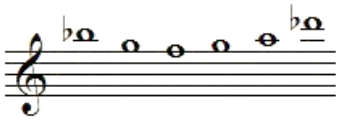
2.2.b. Steshenko-Kuptina, 1936: 275



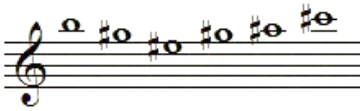
2.3. Steshenko-Kuptina, 1936: 276



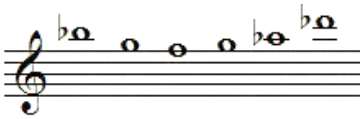
2.4. Rosebashvili, 1975, 1981: 45



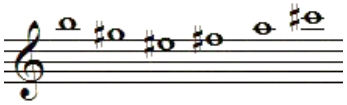
2.5. Rosebashvili, 1986: 2



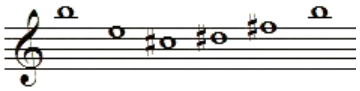
2.6. Rosebashvili, 1975, 1986: 3



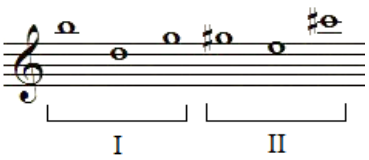
2.7. Rosebashvili, 1975, 1981: 45



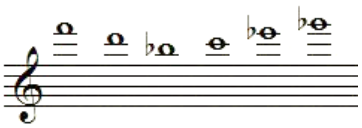
2.8. Rosebashvili, 1981: 45



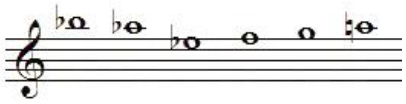
2.9. Rosebashvili, 1981: 45



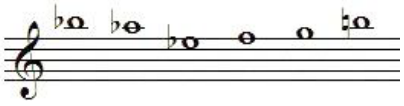
2.10. Steshenko-Kuptina, 1936: 278



2.11. Rosebashvili, 1985: [1, 5]



2.12. Rosebashvili, 1985: [3]



Score example 2. Tunings of *larchemis* and *soinaris*

I aim to determine the interaction of these tunings, to make corrections in notated tunings based on the analysis of audio sources if necessary, and to identify technical flaws in the notated tunings that reduce the number of notated tunings. While determining, identifying and notating the tunings the main basis is the principles of tuning provided by Steshenko-Kuptina.

Analyzing frequencies

Steshenko-Kuptina transferred each note to a monochord string tuned according to a tuning fork, to measure the frequencies of the *larchemi* and *soinari*. She considered this method to be more objective than measuring it with a wind instrument (Steshenko-Kuptina, 1936: 226). In that way she measured the pitches of the pipes of five tuned instruments in hertz (Steshenko-Kuptina, 1936: 167, 168, 226; Table 3: 1-4).

Table 3. Analyzing frequencies of *larchemis* and *soinaris* (Стешенко-Куфтіна, 1936: 167)

3.1. I larchemi

	6th pipe	5th pipe	4th pipe	3rd pipe	2nd pipe	1st pipe
Hertz	903	734	613	701	830	1008
Cent	-358,735	-311,872	232,2328	292	336,3749	
	A	Fis	Dis	Eis	Gis	H

3.2. II larchemi

	6th pipe	5th pipe	4th pipe	3rd pipe	2nd pipe	1st pipe
Hertz	839	701	580	631	746	896
Cent	-311,108	-328,034	145,9045	290	317,1877	
	A	Fis	Dis	Eis	Gis	H

3.3. III larchemi

	6th pipe	5th pipe	4th pipe	3rd pipe	2nd pipe	1st pipe
Hertz	863	716	583	606	739	903
Cent	-323,281	-355,756	66,98629	344	346,9819	
	A	Fis	Dis	Eis	Gis	H

3.4. Soinari

	6th pipe	5th pipe	4th pipe	3rd pipe	2nd pipe	1st pipe
Hertz	1398	1217	970	1069	1290	1496
Cent	-240,042	-392,727	168,2462	325,3311	357,337	
	F	D	B	C	Es	Ges

I have measured audio samples of tunings and repertoire of five *larchemi*s and five *soinari*s in the program Adobe Audition[16]. For some notes I chose different enharmonic variants depending on which note would be relevant to the tuning principle of V. Steshenko-Kuptina. Based on the hertz measured by me and determined by Steshenko-Kuptina, I calculated the distance between notes (in cents) for each tuning, with the pitch sequences and scales set out in Table 4.

Table 4. Analyzing frequencies of *larchemis* and *soinaris*

	6th pipe		5th pipe		4th pipe		3rd pipe		2nd pipe		1st pipe	
I Larchemi (audio ex. 8)	860 Hertz	A5 -25 cents	719 Hertz	F#5 -49 cents	625 Hertz	D#5 +7 cents	715 Hertz	F5 + 41 cents	806 Hertz	A♭5 -47 cents	1020 Hertz	C6 -20 cents
II Larchemi (audio ex. 14)	880 Hertz	A5	760 Hertz	G5 -55 cents	647 Hertz	E5 -30 cents	740 Hertz	F#5 +1 cents	850 Hertz	A5 -60 cents	993 Hertz	Ces5 +10 cents
III Larchemi (audio ex. 18)	883 Hertz	A5 +5 cents	580 Hertz	D5 -21 cents	495 Hertz	H4 +5 cents	554 Hertz	C#5 -1 cents	677 Hertz	E5 +47 cents	876 Hertz	A5 -7 cents
IV Larchemi (audio ex. 22)	890 Hertz	A5 +21 cents	699 Hertz	F5 +2 cents	540 Hertz	C5 +55 cents	692 Hertz	D5 +15 cents	741 Hertz	F#5 +2 cents	971 Hertz	H5 -29 cents
V Larchemi (audio ex. 30)			747,71 Hertz	F#5 +17 cents	630,65 Hertz	D#5 +23 cents	708,3 Hertz	F5 +24 cents	808,39 Hertz	G#5 - 46 cents	993,82 Hertz	H5 +10 cents
I Soinari (audio ex. 1)	1343 Hertz	E6 +33 cents	1150 Hertz	D6 -36 cents	948 Hertz	B5 +28 cents	1051 Hertz	C6 -11 cents	1279 Hertz	E♭ -7 cents	1479 Hertz	G♭ -0 cents
II Soinari (audio ex. 5)	1014 Hertz	H5 +45 cents	854 Hertz	A♭5 +48 cents	699 Hertz	F5 +2 cents	770 Hertz	G5 -30 cents	996 Hertz	H5 -36 cents	1151,11 Hertz	D6 -35 cents
III Soinari (audio ex. 7)	936 Hertz	B5 +6 cents	735 Hertz	G♭5 -10 cents	630 Hertz	E♭5 +22 cents	699 Hertz	F5 +2 cents	814 Hertz	A♭5 -32 cents	964 Hertz	C♭5 -41 cents
IV Soinari (audio ex. 25)	932 Hertz	B5 +0 cents	822 Hertz	A♭5 -16 cents	633 Hertz	E♭5 +30 cents	698 Hertz	F5 -0 cents	779 Hertz	G5 -9 cents	875 Hertz	A5 -8 cents
V Soinari (audio ex. 32)	1398 Hertz	F +1 cents	1217 Hertz	D +61 cents	970 Hertz	B +68 cents	1069 Hertz	C +36 cents	1290 Hertz	E♭ +62 cents	1496 Hertz	G♭ +18 cents

[16] I am grateful to Levan Veshapidze and Ilia Jgharkava for teaching me the methodology of measuring hertz and cents and for consultating me as I worked.

Tuning the instrument

Stesheko-Kuptina recorded the technique of the tuning process for the *soinari*: "the great bass is thought to be the principal tone, from which they find the minor bass at a distance of about 3/4[17] tones. From both of the basses they find both thirds. When assessing the tuning, they use two corrective methods: the first bass and the right third[18] and the second bass with the left third[19]; then they assess the first, second, third, fourth, fifth and sixth voices" (Steshenko-Kuptina, 1936: 212). Stesheko-Kuptina is of the opinion that the West Georgian panpipe has such clear tuning and firm principles of tuning that we can consider it as a musical system (Steshenko-Kuptina, 1936: 224). She recorded the method used for assessing and defining the tunings – stuffing the pipes with sand or corn flour (Steshenko-Kuptina, 1936: 208).

Steshenko-Kuptina herself was guided by the principles of tuning and notation mentioned above. She notated the tunings and the repertoire by preferring the aural impression and selecting an enharmonic version for the sounds[20]. Sometimes, the hertz values and notes selected by her do not match. For instance, each of the 'thirds played on the bass pipe' is provided by the researcher in every notated sample (score example 2: 1-3, 10), although, according to her hertz analysis, when playing the outer pipes sequentially, the thirds do not always occur. If in the tempered tuning the distances between minor thirds are 300 cents, here, the distance between the notes varies from 240 to 360 cents. For instance, using the main principles of the instrument tuning: if the distance between the 6th and 5th pipes was 240 cents (table 3: 4), which causes it to sound closer to a major second (audio example 32, 40), she still records it as the notes F and D; this way she also takes her aural impression into consideration, because these two pipes sound to her close to a minor third apart (audio example 34, 41[21]). It was these 'differences' Steshenko-Kuptina was referring to when noting that in process of tuning of *larchemi* and *soinari* performers were using aural criteria that sometimes caused fluctuation and deviation.

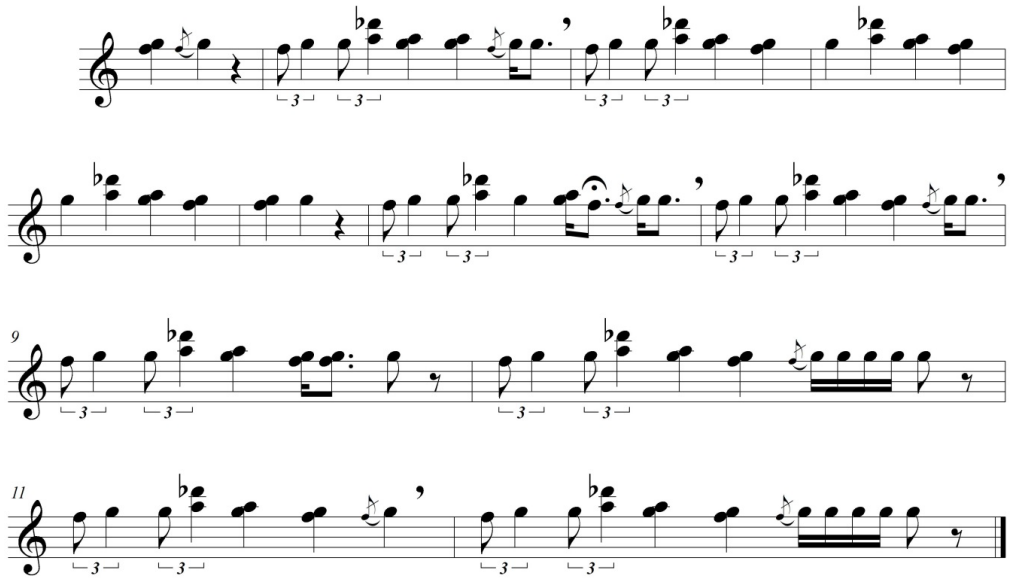
[17] In other words, 150 cents in tempered tuning.
[18] The researcher implies third produced by pipes 4, 5 and 6.
[19] The researcher implies pipe 3 and third produced by pipes 2 and 1.
[20] For instance, if it is possible to record the note of 1217 herz as Es (-38 cents), she recorded as D (+62 cents).
[21] In the audio example 41, the last interval sounds as the third, repeated several times.

In the 1950s, Rosebashvili's point of view about the firmness of the tuning, compared to that of Steshenko-Kuptina, seems less definitive. According to his observations, the interval sizes between the pipes depend on musical taste of the performer and the maker of the instrument, and also on the skill level of the performer – what intervals or sound combinations they want to create in the pieces they play. Such a free approach to the tuning of the instrument is not otherwise known to us, so it seems doubtful – perhaps it is the impression of the researcher, or just a story from an informant. In Rosebashvili's audio recordings and scores we encounter second and fourth intervals that in my opinion are related to faulty instrument tuning and construction.

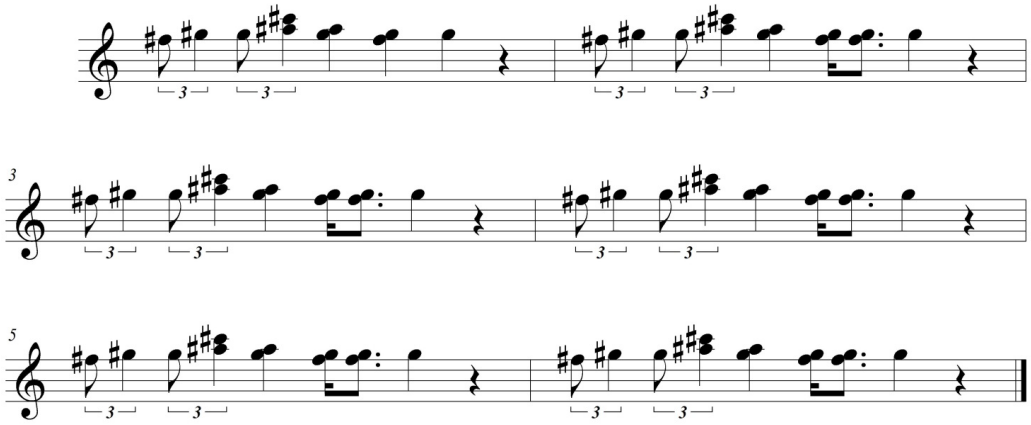
Larchemi and soinari tunings

Fieldwork expedition sources recorded by K. Rosebashvili and O. Chijavadze have historical importance, although in the research by K. Rosebashvili there are some flaws, especially in terms of tuning and of notating the repertoire.

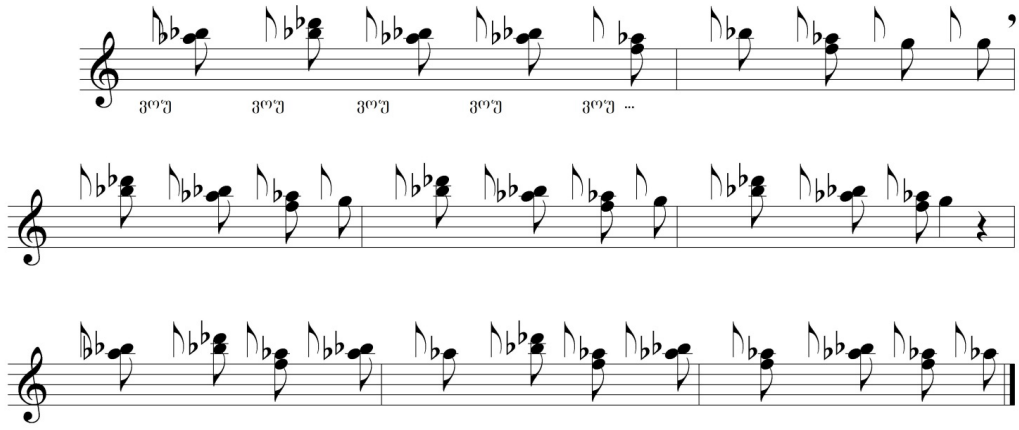
While the tuning notations of the *larchemi* by Steshenko-Kuptina are always similar (although sometimes there is a major second between the fourth and third pipes, sometimes a minor second), the recordings by K. Rosebashvili are quite different. He recorded audio samples of five tunings (four *larchemis* and one *soinari*), but in the notated versions of these recordings there are seven tunings (six on *larchemi* and one on *soinari*). My research has led me to the following conclusions. Firstly, none of the notated repertoires matches precisely its recorded audio version. Secondly, it looks from the tunings of the four pieces recorded from Dzokia Aronia as if the performer plays four different instruments, but from the audio recordings we can verify that he used only two different instruments (score example 3: 1–4). Thirdly, sometimes the notated sample does not match the indicated tuning. Three out of four tunings match neither his audio recordings, nor the repertoire notated by him. Thus, musical analysis based on Rosebashvili's notated samples gave us faulty conclusions, both in Rosebashvili's own work, and in general.



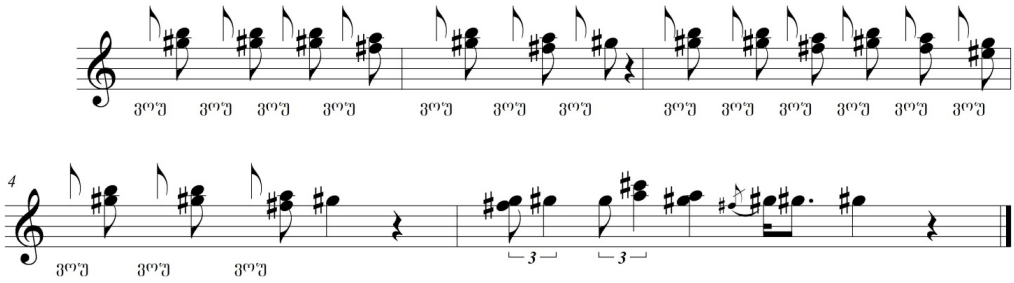
Score example 3.1. See the list of the notated instrumental pieces, #11. Musical ex. #10.



Score example 3.2. See the list of the notated instrumental pieces, #12. Musical ex. #16.



Score example 3.3. See the list of the notated instrumental pieces, #13. Musical ex. #13.



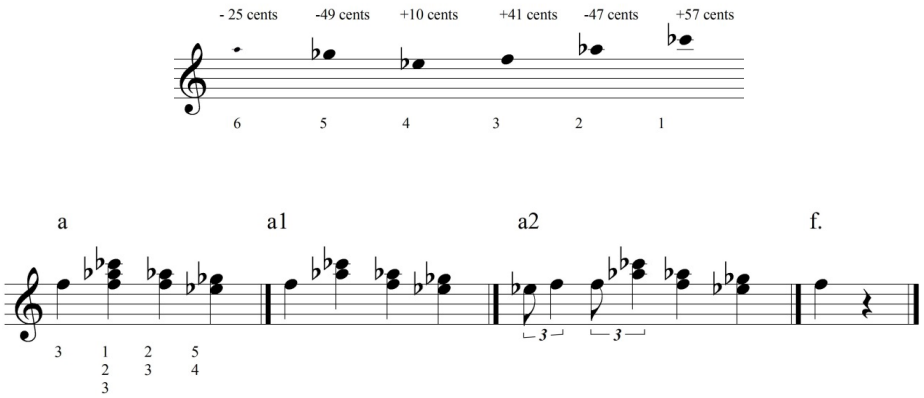
Score example 3.4. See the list of the notated instrumental pieces, #14. Musical ex. #17

At the beginning of my work with tunings I grouped audio samples recorded at different times and played by different performers. It was obvious that Dzokia Aronia's repertoire was recorded by K. Rosebashvili (1958) and O. Chijavadze (1959), and that only one player of *soinari*, Varden Meparishvili, was recorded by Sh. Mshvelidze (1931), V. Steshenko-Kuptina (1936) and K. Rosebashvili (1959). It turns out that the same performers were playing the same repertoire but using different instruments with different tunings in recordings from different years. Some of them almost exactly match the tunings and hertz measurements by Steshenko-Kuptina and the audio samples resurrected by the computer – I made an experiment on *soinari* repertoire recorded by this researcher, creating the audio versions of the fragments according to the hertz noted in these repertoires, which allowed me to listen to the real sound of the notated samples (audio example 33–39).[22]

The question inevitably arises: how can all of seven tunings of the *soinari*, recorded at different times, be independent and different from each other, if the performer plays the same repertoire but at different times? We should take into consideration the fact that sometimes these musical pieces do not sound precisely just like as any musical piece sounds on the instrument with no tuning.

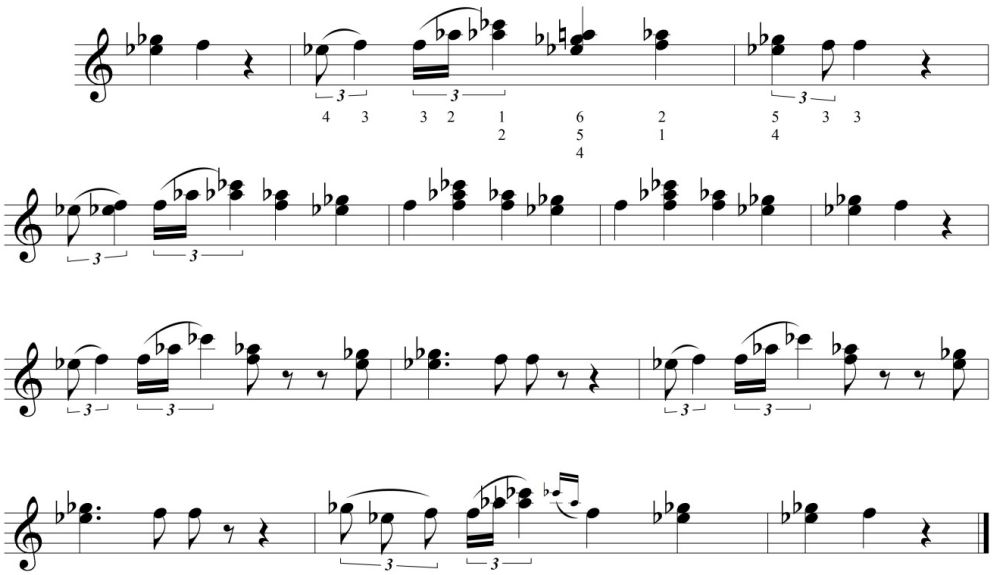
We concluded that the various tunings available to us have the same basic principle and that the differences between them are connected to the damage to the instrument arising from different technical or objective causes. While notating the musical material and defining the tunings I took these flaws into account and tried to cause the repertoire to sound as I thought it had sounded before the instrument damage occurred (score example 4: 1–10).

[22] I wish to thank Levan Veshapidze, who did the experiment. The sound timbre of the audio samples was taken from the audio recordings by Mshvelidze.

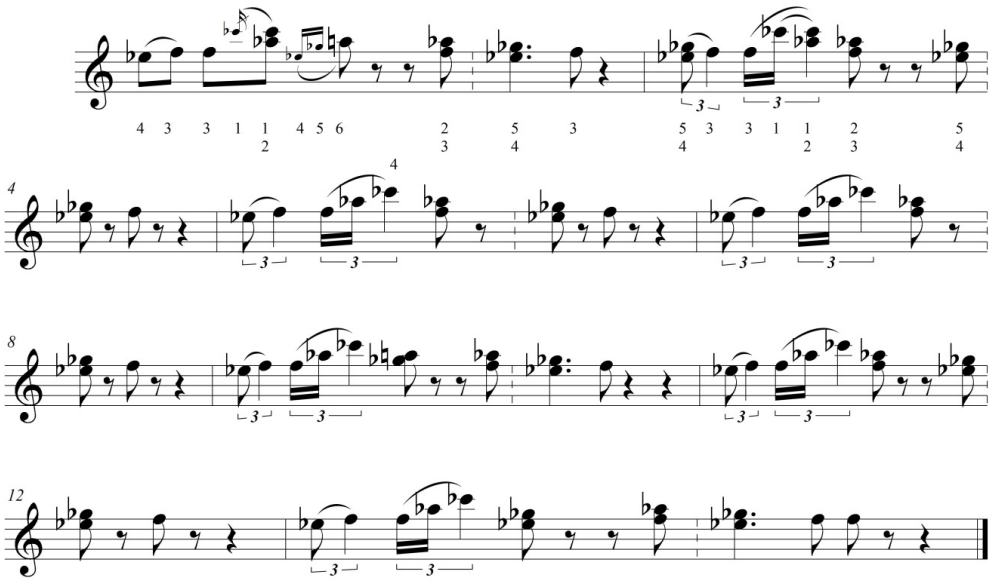


a, a, a1, a1, a1, a1, fin, a2, f.

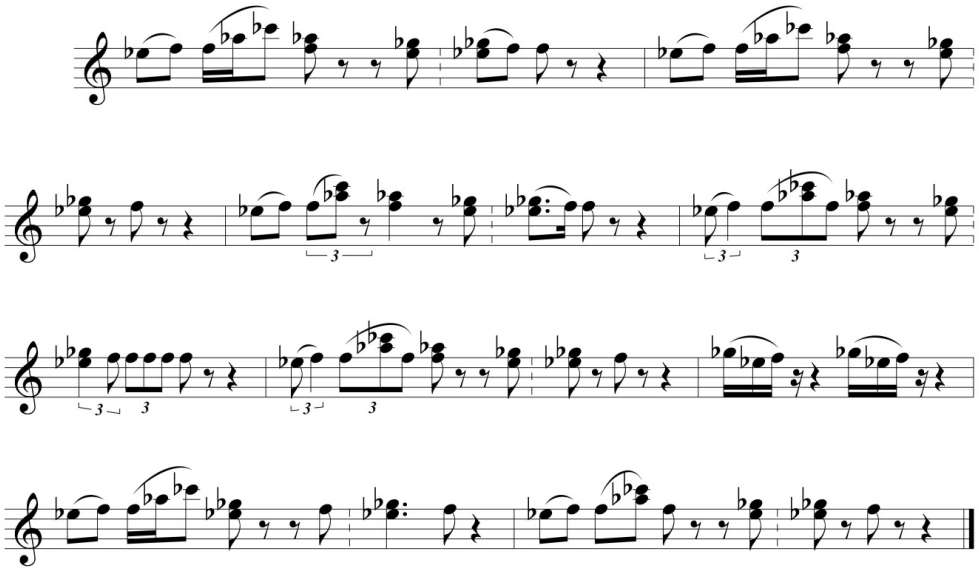
Score example 4.1. 1st tuning and 1st instrumental piece (see audio ex. 8, 9).



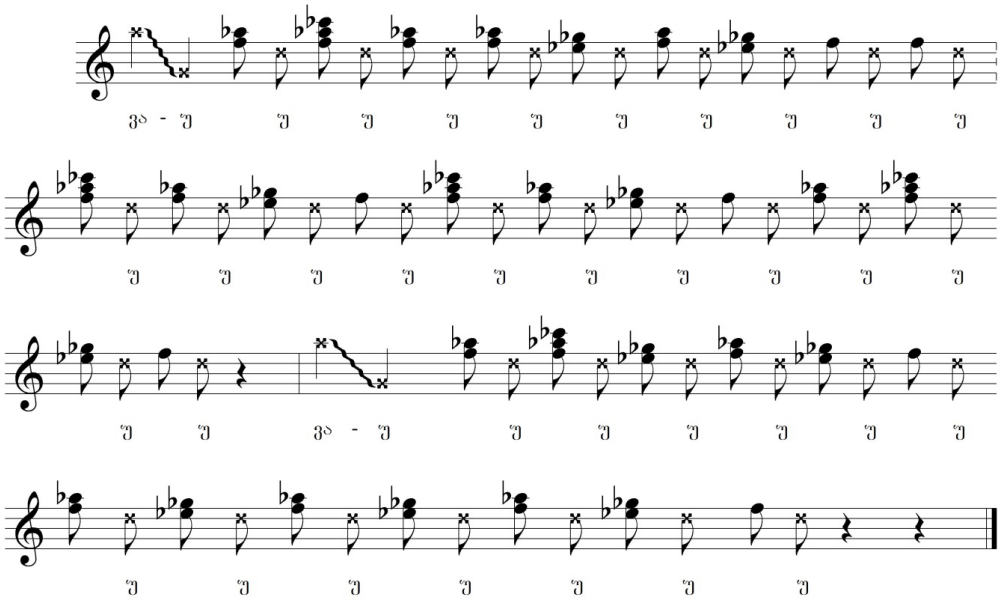
Score example 4.2. 2nd instrumental piece in 1st tuning (see audio ex. 10)



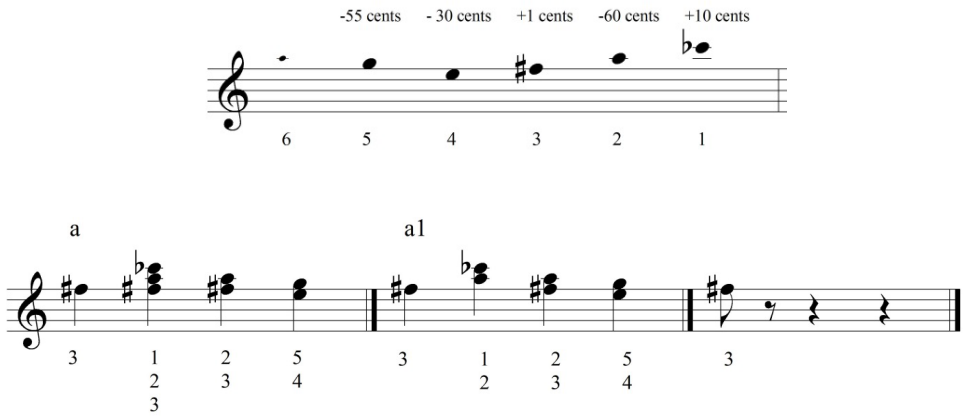
Score example 4.3. 3rd instrumental piece in 1st tuning (see audio ex. 11, score ex. 3.1)



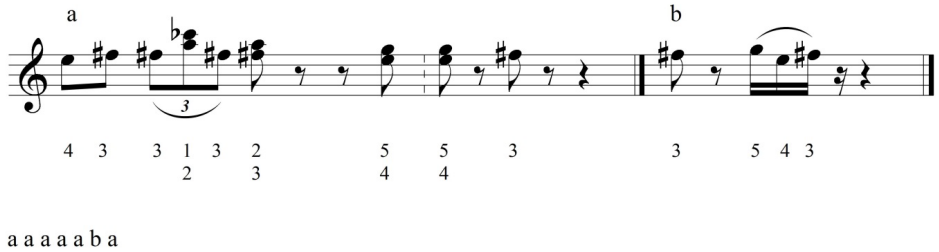
Score example 4.4. 4th instrumental piece in 1st tuning (see audio ex. 12)



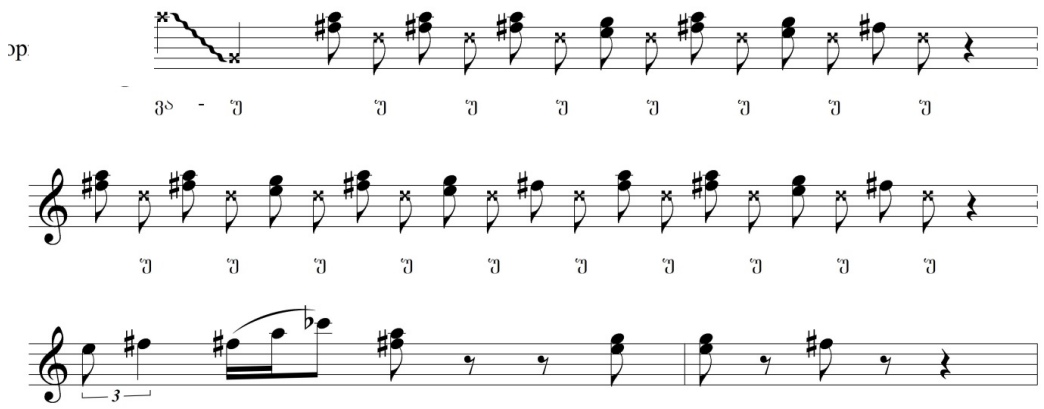
Score example 4.5. 5th instrumental piece in 1st tuning (see audio ex. 13, score ex. 3.3)



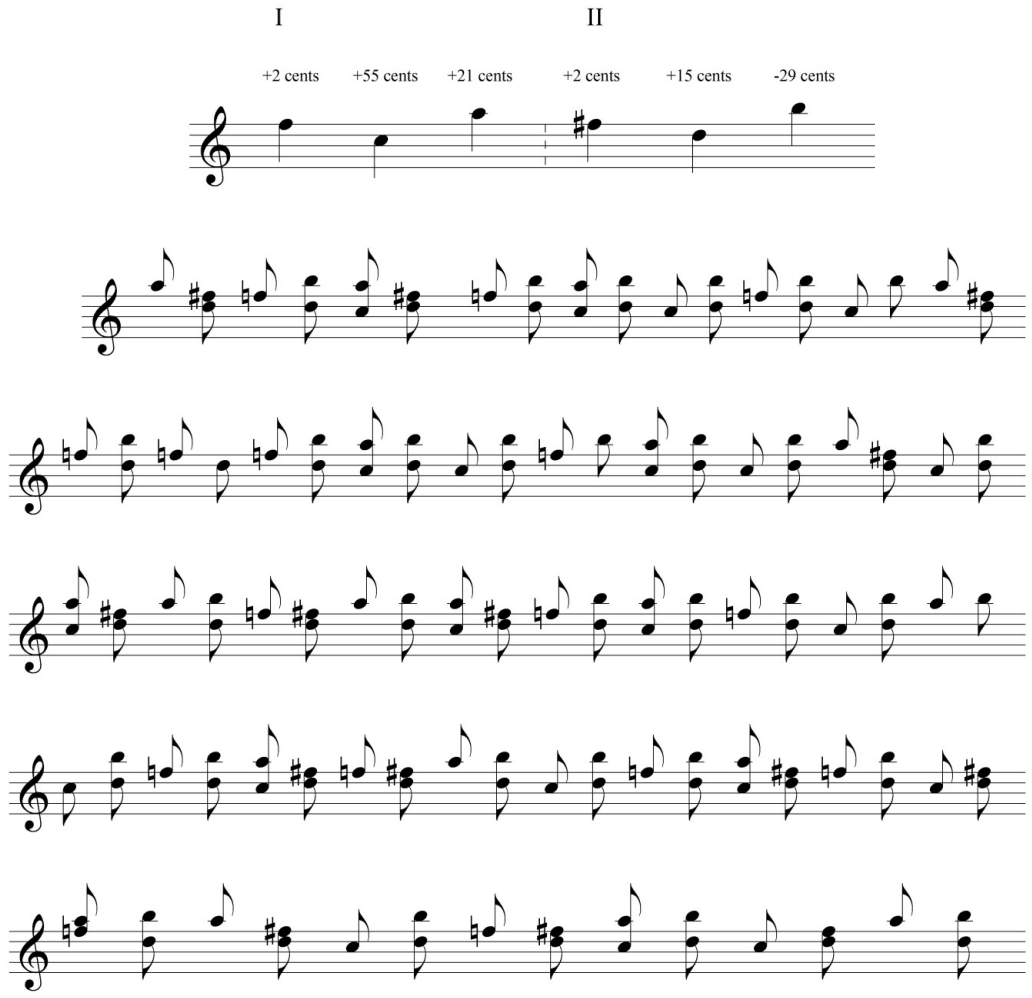
Score example 4.6. 2nd tuning and 1st instrumental piece (see audio ex. 14, 15)



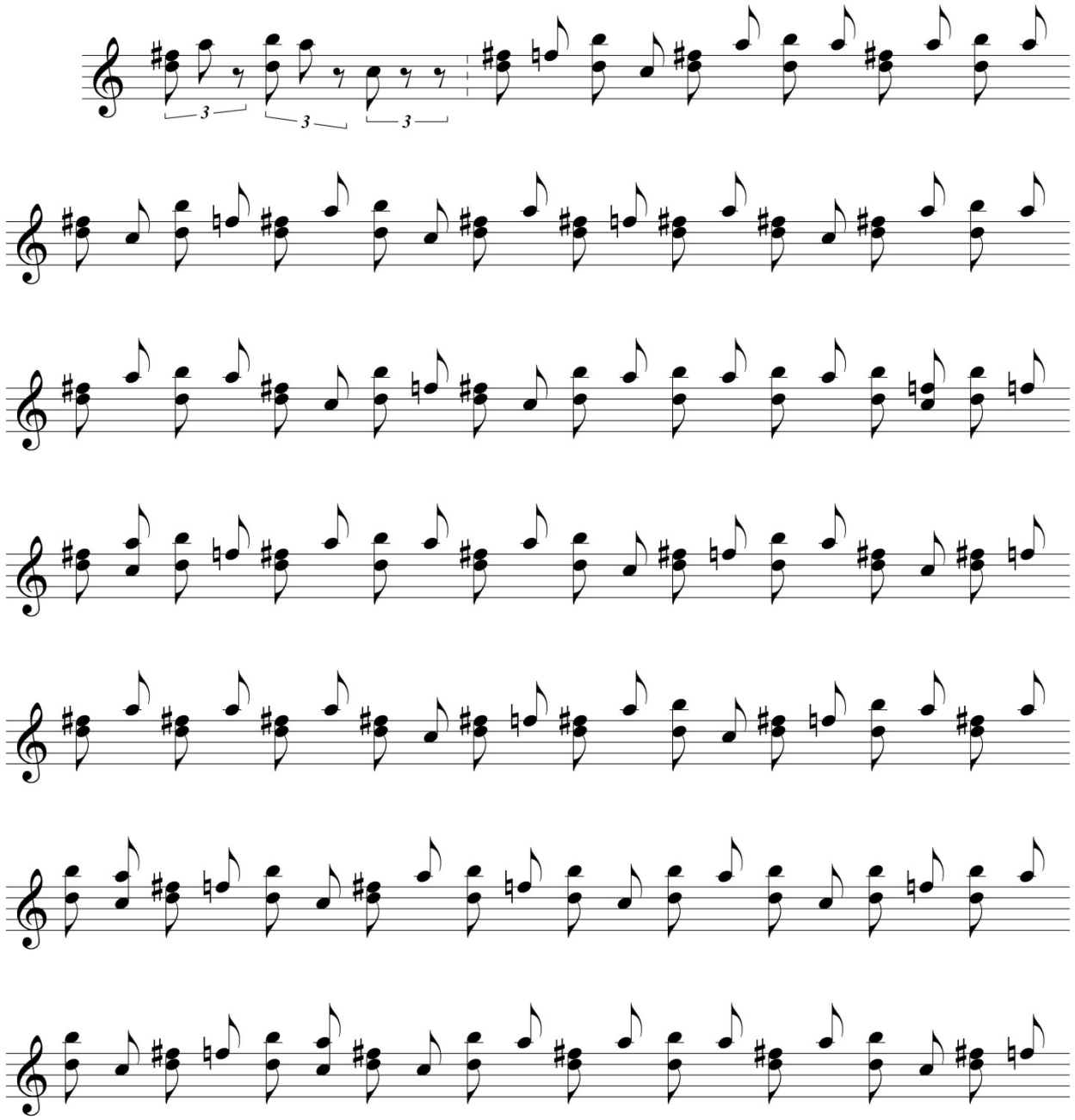
Score example 4.7. 2nd instrumental piece in 2nd tuning (see audio ex. 16, score ex. 3.2)



Score example 4.8. 3rd instrumental piece in 2nd tuning (see audio ex. 17, score ex. 3.4)



Score example 4.9. 4th tuning and 3rd 'Nirzi' (see audio ex. 22, 24; score ex. 5.3)



Score example 4.10. 4th 'Nirzi' in 4th tuning (see audio ex. 23)

Social Function and Repertoire

We have more information about the *larchemi*'s social functions and repertoire than about those of the *soinari*. From the examples of *larchemi* repertoire available to us, there are three ensemble pieces - 'Nirzi'; solo instrumental pieces recorded by Rosebashvili are mainly 'Mtskemsuri', and most of the pieces recorded by Steshenko-Kuftina are dance examples.

The *larchemi* is considered to be the instrument of shepherds in Georgia. There is documentation about three ways of playing it, related to herding the cattle: first while going to pasture, second while grazing, and third while coming back home (Steshenko-Kuptina, 1936: 211). In addition, villagers played the *larchemi* during weddings and while marching after the overnight rituals of religious holidays (Makalatia, 1941: 257). The *larchemi* was also used to heal the sick through the ritual of 'catching the soul', in which four Megrelian players participated. In this case the voice of the *larchemi* (which sounds like someone whistling) was considered to represent the soul of the dead, and the instrument was used to summon or catch the soul (Rosebashvili, 1960: 51).

The Gurian *soinari* was connected to farming and traveling, especially traveling at night. As researchers note, this may be related to the ancient Greek habit of refraining from playing during the daytime so as not to awake the god Pan (Steshenko-Kuptina, 1936: 214-215).

According to the notes recorded by Steshenko-Kuptina, villagers played the *larchemi* with the *daira* (frame drum) and Svanetian *chianuri*, (bowed lute). Also, in the ceremony after Holy Thursday, they played it with the *daira* and wooden trumpet (Steshenko-Kuptina, 1936: 210).

There was a form of competition between two *larchemi* players in Samegrelo called 'Nirzi', an instrumental dialogue, in which two performers divided the instrument into two (3+3) and competed with each other. The winner was the one who played different tunes longer (Steshenko-Kuptina, 1936: 209; Makalatia, 1941: 257; Rosebashvili, 1960: 50-51). When the *larchemi* was divided into two, each set of three pipes was arranged so that the longest one was located in the middle.

Analysis of the Musical Samples

The range of repertoire for the *larchemi* and *soinari* matches the range of their tunings. The lowest (fourth pipe) and the highest (first pipe) are used in all of the pieces. Hence, the range of the repertoire may be the interval of a sixth or seventh (5^{th}-1^{st} pipes), while the stable intonation frame is within the perfect fourth (5^{th}-2^{nd} pipes).

Vertical harmony is mostly based on the movement of thirds. There are no seconds. Based on the tuning, to produce a second one would have to simultaneously play both of

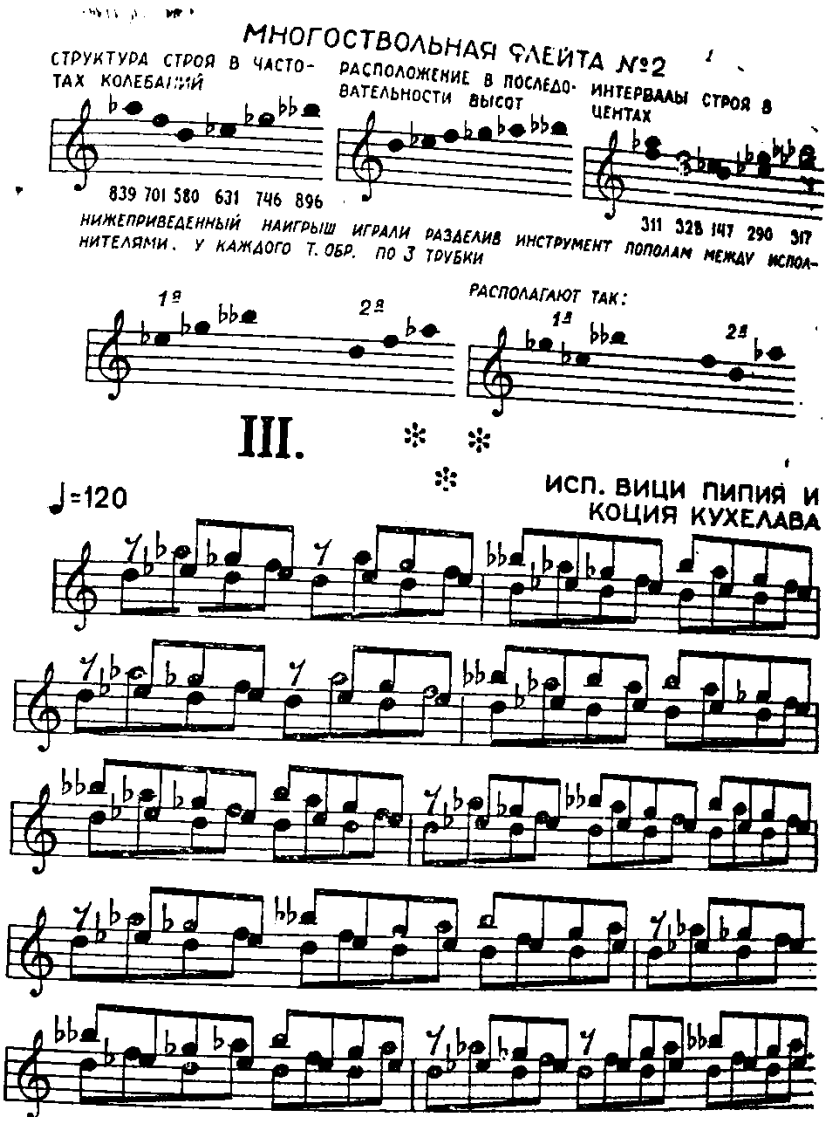
the bass pipes (4th and 3rd), although, as I mentioned above, these pipes are never heard at the same time, as they match the 7th and the 1st steps of the scale. It is noted in the scholarly literature that three-voice polyphony can be heard only in questionable and fragmentary form on Georgian panpipes (Zhghenti, 2017: 202), although, when we studied the audio material, it was evident that there was also a real three-voice polyphony (audio example 40).

Pieces for the Georgian panpipe have a cyclical form[23] (there are no contrasting sections, but there are signs of cyclical variation[24]); the form is always open, and the duration of the piece depends on the performer.

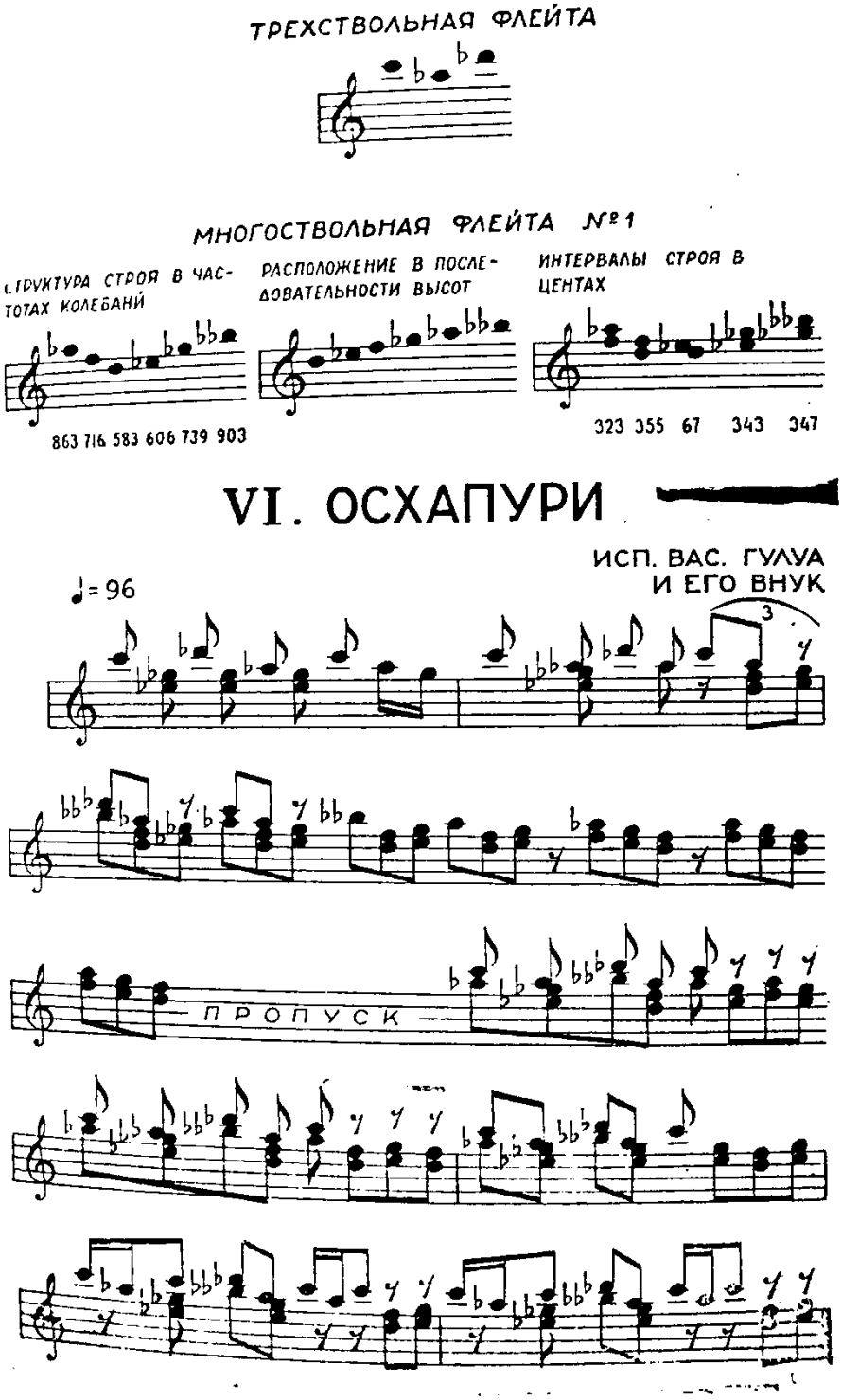
In the repertoire of the instruments with limited pitch and harmony, dramaturgical development is achieved via the following methods: alternating time signatures between 2/4 and 3/4; changing the vertical harmony in the same stanzas (playing vertical chords consisting of two or three notes on the same beat of the bar and intervals or three-note chords sounding simultaneously, as well as in arpeggio form); syncopated or accented rhythm; and finally, shouts inserted after each quarter in the identical melodic formulas. As for the pieces with shouts, the shouts appear in the culminating sections of the cycling form, after certain parts of the cycle, and provide optimum dynamic development. These are not individualized melodies, but non- individualized short intonation formulas characteristic of archaic musical thinking, the ostinato-variation repetition of which creates phrases and stanzas. Signs of heterophony are also apparent.

In the three notated recordings of the 'Nirzi' available to us (score example 5: 1–3), we see that five *larchemis* out of six had three pipes, and only one had six pipes (score example 5: 2). This instrumental piece is, in my opinion, an unsuccessful musical experiment, for three reasons. First, an atypical composition of the pipes is used – 6+3 (according to the informant, two parts of one instrument must be used here to get the appropriate sound). Second, registers of the six-pipe and three-pipe flutes are significantly different. Third, one of the performers was young and inexperienced, and struggled with tuning the pipes.

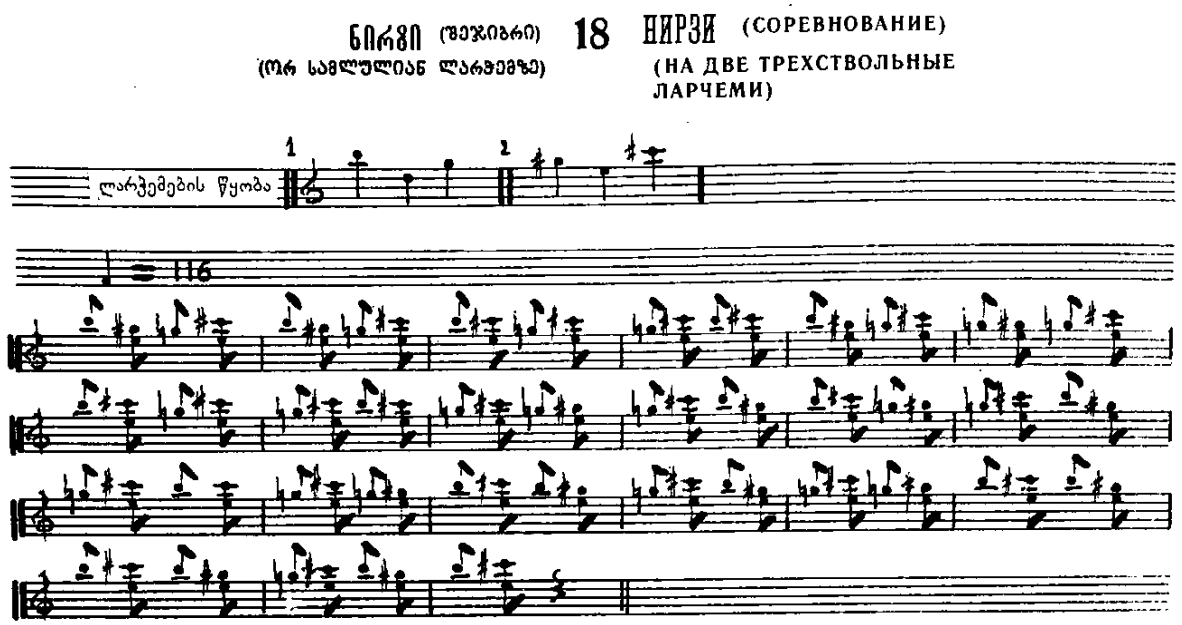
[23] Steshenko-Kuptina united the samples of Varden Meparishvili as cyclical form and noted that this proves that panpipe was a highly developed instrument (Steshenko-Kuptina, 1936: 213).
[24] Cyclical variation form is characteristic of Georgian instrumental music, for example, in the repertoires of the *chonguri* (bowed lute), *panduri* (plucked lute), *chiboni* (bagpipe), etc.



Score example 5.1. 1st 'Nirzi' (Steshenko-Kuptina, 1936: 275)



Score example 5.2. 2nd 'Nirzi' (Steshenko-Kuptina, 1936: 277)



Score example 5.3. 3rd 'Nirzi' (Rosebashvili, 1981: 46; see score ex. 4.9)

K. Rosebashvili noted that the tuning and compositions of the *larchemi* preserved to date have little in common with the laws of general Georgian vocal style (Rosebashvili, 1986: 16). However, many aspects of construction and repertoire reveal several indications of this connection:

- The names of the pipes, functionally matching the sounds they produce;
- Movement via parallel thirds, which is characteristic of complex polyphony (Shilakadze, 1970: 68);
- Matching of the intensively used pipes to the 7th-1st-2nd-3rd steps;
- Matching of the bass pipes and 1st and 7th steps of the scale, and intensive use of them in a similar context;
- Altering of the sound of the pipe called *krimanchuli*/*tsvrili* in tunings of different instruments;
- The fifth pipe matching the second step, sounding only with the fourth pipe matching the 7th step of the scale.

After studying the musical material it was possible to classify the repertoire of the panpipe, based on specific criteria, taking contemporary tendencies into consideration (table 5).

Table 5. Classification of the repertoire of the panpipe, based on specific criteria

Criterion	**Larchemi/Soinari repertoire**	
Genre	1. Shepherd 2. Dance piece 3. Without clear social function 4. Stage music (contemporary practice)	
Form of performing	1. Solo 2. Ensemble a. Several ensembles of six-pipe instruments b. 'Nirzi': two three-pipe (one instrument divided into two) instrument ensembles 3. Instrumental inserted in poetry	Instrumental
	4. Three seven-pipe instruments with singing choir (contemporary practice)	Vocal-instrumental
Musical form	1. One part 2. Cycle (variational cycle) 3. Contrast-compiled cycle	
Development principle	Ostinato-variational, free ostinato	
Structure/type of the polyphony	Heterophony, ostinato	
Scale	1. Diminished scale, with scale centre: 1.1. On the third pipe 1.2. On the fourth pipe 2. Sonorous scale	
Cadence	1. Open 2. Closed	
Tuning	Diminished three-note chords. Distance between bass pipes: 1. Minor second 2. Major second 3. Augmented second	
Diapason	1. Sixth 2. Seventh	
Performing technique	3. With shouts (*dasakviri*) 4. Without shouts	
Number of pipes used	1. 5 pipes 2. 6 pipes	

Conclusion

The Georgian panpipe is one of an ancient pieces of the Georgian instrumentarium. It stands out among the world's pan flutes with its original construction and polyphonic mode of performance. Despite the fact that the instrument has disappeared from everyday life, the scores and audio sources available to us, has allowed me to research the unknown features of the instrument, such as tuning and performance issues.

Some people in Samegrelo wish to restore the instrument to performance. I think it is possible that the methodology of notation of the score and audio sources available to us that I have provided could be the beginning of the revival of the instrument.

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List of Score and Audio Examples:

Notated instrumental pieces:

1. Untitled. Larchemi. Performed by Vitsi Pipia. Chkvaleri, Samegrelo, recorded in 193? (Steshenko-Kuptina, 1936: 273, I).

2. *Khasanbegura*. Larchemi. Performed by Vitsi Pipia. Chkvaleri, Samegrelo, recorded in 193? (Steshenko-Kuptina, 1936: 274, II).

3. Untitled. Larchemi. Performed by Vitsi Pipia and Kotsia Kukhilava. Chkvaleri, Samegrelo, recorded in 193? (Steshenko-Kuptina, 1936: 275, III).

4. *Oskhapuri.* Larchemi. Performed by Vasil Gulua. Tskhakaia, Samegrelo, recorded in 193? (Steshenko-Kuptina, 1936: 276, IV).

5. *Obireshi.* Larchemi. Performed by Vasil Gulua. Tskhakaia, Samegrelo, recorded in 193? (Steshenko-Kuptina, 1936: 276, V).

6. *Oskhapuri*. Larchemi. Performed by Vasil Gulua and his son. Tskhakaia, Samegrelo, recorded in 193? (Steshenko-Kuptina, 1936: 277, VI).

7. *First piece.* Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 193? (Steshenko-Kuptina, 1936: 278, VIIA).

8. *Satsekvao* (dance example). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 193? (Steshenko-Kuptina, 1936: 278, VIIB).

9. Untitled. Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 193? (Steshenko-Kuptina, 1936: 278, VIIД).

10. *Sasimghero* (vocal example). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 193? (Steshenko-Kuptina, 1936: 278, VIIC).

11. *Mtskemsuri* (shepherd's). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo, recorded in 1958 (Rosebashvili, 1975, 1981: 45, 1985: 4, 1986: 1). Audio instrumental piece #10.

12. *Mtskemsuri* (shepherd's). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo, recorded in 1958 (Rosebashvili, 1986: 2). Audio instrumental piece #16.

13. *Mtskemsuri dadzakhili* (Shepherd's, with exclamations). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo, recorded in 1958 (Rosebashvili, 1996: 3). Audio instrumental piece #13.

14. *Mtskemsuri dasakviri* (shepherd's, with exclamations). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo, recorded in 1958 (Rosebashvili, 1996: 3). Audio instrumental piece #17.

15. *Mtskemsuri* (shepherd's). Larchemi. Performed by Gera Kukhilava. Chkvaleri, Samegrelo, recorded in 1958 (Rosebashvili, 1981: 45, 1985: 5, 1986: 5, I). Audio instrumental piece #19.

16. *Mtskemsuri* (shepherd's). Larchemi. Performed by Gera Kukhilava. Chkvaleri, Samegrelo, recorded in 1958 (Rosebashvili, 1981: 45, 1985: 5, 1986: 6, II). Audio instrumental piece #20.

17. *Mtskemsuri* (shepherd's). Larchemi. Performed by Gera Kukhilava. Chkvaleri, Samegrelo, recorded in 1958 (Rosebashvili, 1981: 46, 1985, 1986: 6, III). Audio instrumental piece #21.

18. *Nirzi* (competition). With two three-pipe larchemis. Performed by Gera and Grigol Kukhilavas. Chkvaleri, Samegrelo, recorded in 1958 (Rosebashvili, 1981: 46, 1985: 6, 1986: 4). Audio instrumental piece #24.

19. *Satsekvao* (dance example). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1959 (Rosebashvili, 1985: [1]). Audio instrumental piece #29.

20. *Dasakravi* (instrumental piece). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1959 (Rosebashvili, 1985: [2]). Audio instrumental piece #28.

21. *Dasakravi* (instrumental piece). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1958 (Rosebashvili, 1985: [1]). Audio instrumental piece #27.

Audio examples:

1. Tuning (I). Soinari. Performed by Varden Meparishvili. Kokhnari, Chokhatauri, recorded in 1931 (Mshvelidze, 2007: CD5, #18), 0:39.

2. *Dasakravi* (instrumental piece in I tuning). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1931 (Mshvelidze, 2007: CD5, #16), 0:30.

3. *Dasakravi* (instrumental piece in I tuning). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1931 (Mshvelidze, 2007: CD5, #17), 1:32.

4. *Dasakravi shedzakhilebit* (instrumental piece with exclamations in I tuning). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1931 (Mshvelidze, 2007: CD5, #20), 0:35.

5. Gr. Sharabidze's Tuning (II). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1931 (Mshvelidze, 2007: CD5, #21), 0:35.

6. *Dasakravi* (instrumental piece in big soinari, II tuning). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1931 (Mshvelidze, 2007: CD5, #22), 2:05.

7. *Dasakravi* (instrumental piece in big soinari, III tuning). Performed by Varden Meparishvili. Tsipnari, Guria, recorded in 1931 (Mshvelidze, 2007: CD5, #19), 1:28.

8. Tuning (I). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (the Archive of Georgian Folk Music Laboratory of Tbilisi State Conservatoire [AGFML], expedition tape #99, 00:00-00:45), 0:41.

9. *Dasakravi* (instrumental piece, in I tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 00:45-01:10), 0:22.

10. *Dasakravi* (instrumental piece, in I tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 2:08-02:38), 0:29.

11. *Dasakravi* (instrumental piece, in I tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 2:39-03:05), 0:26. Notated instrumental piece #11.

12. *Dasakravi* (instrumental piece, in I tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 03:05-03:32), 0:27.

13. *Dasakravi* (instrumental piece with exclamations, in I tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 04:01-04:27), 0:22. Notated instrumental piece #13.

14. Tuning (II). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 01:10-01:35), 0:11.

15. *Dasakravi* (instrumental piece, in II tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 01:35-02:08), 0:33.

16. *Dasakravi* (instrumental piece, in II tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 03:32-04:01), 0:28. Notated instrumental piece #12.

17. *Dasakravi* (instrumental piece with exclamations, in II tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 04:27-04:42), 0:14. Notated instrumental piece #14.

18. Tuning (III). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 06:28-06:52), 0:20.

19. *I Mtskemsuri* (shepherd's, in III tuning). Larchemi. Performed by Gera Kukhilava. Chkvaleri, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 06:52-07:30), 0:37. Notated instrumental piece #15.

20. *II Mtskemsuri* (shepherd's, in III tuning). Larchemi. Performed by Gera Kukhilava. Chkvaleri, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 07:30-08:10), 0:39. Notated instrumental piece #16.

21. *III Mtskemsuri* (shepherd's, in III tuning). Larchemi. Performed by Gera Kukhilava. Chkvaleri, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 08:10-08:53), 0:43. Notated instrumental piece #17.

22. Tuning (IV). Larchemi. Performed by Gera and Grigol Kukhilavas. Chkvaleri, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 04:55-05:17), 0:20.

23. *I Nirzi* (competition, in IV tuning). With two three-pipe larchemis. Performed by Gera and Grigol Kukhilavas. Chkvaleri, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 05:17-05:58), 0:41.

24. *II Nirzi* (competition, in IV tuning). With two three-pipe larchemis. Performed by Gera and Grigol Kukhilavas. Chkvaleri, Samegrelo. Recorded by K. Rosebashvili, 1958 (AGFML, expedition tape #99, 05:58-06:28), 0:29. Notated instrumental piece #18.

25. Tuning (IV). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria. Recorded by K. Rosebashvili, 1959 (AGFML, expedition tape #99, 12:41-13:31). 0:58.

26. *Dasakravi* (instrumental piece, fragment, in IV tuning). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria. Recorded by K. Rosebashvili, 1959 (AGFML, expedition tape #99, 09:20-10:15), 0:59.

27. *Dasakravi* (instrumental piece, in IV tuning). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria. Recorded by K. Rosebashvili, 1959 (AGFML, expedition tape #99, 09:20-10:15), 0:59. Notated instrumental piece #21.

28. *Dasakravi* (instrumental piece, in IV tuning, with singing). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria. Recorded by K. Rosebashvili, 1959 (AGFML, expedition tape #99, 11:16-11:09), 1:29. Notated instrumental piece #20.

29. *Dasakravi* (instrumental piece, in IV tuning, with exclamations). Soinari. Performed by Varden Meparishvili. Tsipnari, Guria. Recorded by K. Rosebashvili, 1959 (AGFML, expedition tape #99, 13:39-15:14), 1:44. Notated instrumental piece #19.

30. *Mtskemsuri* (shepherd's, in V tuning). Larchemi. Performed by Varden Meparishvili. Muzhava, Samegrelo. Recorded by O. Chijavadze, 1959 (AGFML, expedition tape #82:16), 1:13.

31. *Mtskemsuri* (shepherd's, in V tuning). Larchemi. Performed by Dzokia Aronia. Muzhava, Samegrelo. Recorded by O. Chijavadze, 1959 (AGFML, expedition tape #82:13), 1:13.

32–39. The audio samples resurrected by the computer. (32, 33, 34, 35, 36, 37, 38, 39)

40. The three-voice polyphony.