

MEASURING LIFE-CYCLES: VARIOUS RHYTHMS AND REFERENCE CLOCKS DETECTED IN A BIOGRAPHICAL CASE STUDY OF THE COMPOSER S. S. PROKOFIEV

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Abstract: Nowadays it is widely accepted that there is not one "truly human" calendar or reference clock for measuring human lives, because analyzing personal information involves many distinct kinds of measurement and there is no conceivable way to harmonize various temporal rhythms, scales and dimensions coordinating all of them. Yet, previously it was suggested that even though we cannot predict the details, we might discover the existence of the universal laws that govern the overall dynamics of complex highly organized systems, such as human culture or social order. This paper will show that S. Prokofiev's personal diaries can illustrate both the complexity of human life and a possibility to discover an interrelated set of natural rhythms reflecting it.

Key-Words: time, time measurement, philosophy of time, history of music, the Phoenix Clock, Sergey Prokofiev

1. Introduction

The 13th century scholar Rabbi Avishai of Bulgaria told an amazing story about his happy opportunity of seeing the rare manuscript *The Powers of the Human's Years* written by the great medieval polymath Abraham Ibn Ezra. Allegedly, in this work Ibn Ezra analyzed everything that happened to him from his birth until his death at the age of 75. One could detect there all Ibn Ezra's acts and deeds throughout his life, day-by-day, month-by-month and year-by-year. Rabbi Avishai believed that such data permitted a reader to decipher the heavenly laws of time and their correspondence with various cosmic reference clocks [1].

Was it a myth or a legend? At present the Ibn Ezra's manuscript is missing and some researchers doubt the very fact of its existence. Furthermore, many people consider as futile any attempt to project an ineffable nexus of events onto a dull austerity of a chronological line.

Yet there exists a true story of a virtuoso pianist and one of the most prominent composers ever, Sergey Prokofiev (1891-1953), whose unique diaries depict his deeds and thoughts day-by-day, week-by-week throughout 26 years of his adulthood. These extensive diaries were first published in 2002, and today they are accessible to empirical study [2]. Analyzed together with Prokofiev's letters and *Autobiography*, they enable us to reconstruct a chronological mapping of his life. The results are astounding as they provide invaluable data for uncovering various rhythmicities reflecting Prokofiev's life-path [3].

S. Eisenstein wrote, "Prokofiev works like

a clock" [4]. Prokofiev's diaries, in which all his experiences are meticulously recorded and chronologically organized, provide a valuable tool for measuring both his personal growth and historical changes during his lifespan. Reading his diaries one gets an impression that the diary as a literary genre can acquire an important role in time studies, and that the art of mapping one's life can be compared with that of arranging data for cartography.

Nowadays, the accepted approach to measurement in cartography, as well as in humanities in general is strongly influenced by Stevens' definition of measurement as the "assignment of numbers to objects according to rules" [5]. In the light of this definition, Prokofiev's diaries present his life as a series of discrete episodes, each of which can be considered "an event" or "an object" in the seemingly whimsical landscape of his lifespan. Furthermore, each entry in the diaries (including all the events related to it) is marked by numbers according to the rules of assigning certain calendar values to each day. As a result, we might say that Prokofiev's diaries provide a basis for biographical measurements in general.

Furthermore, Stevens also introduced his four "scales" or levels of measurement (nominal, ordinal, interval and ratio), which are now familiar to almost any life-scientist [6]. Recognizing the importance of the four scales, Chrisman in his review "Rethinking levels of measurement for cartography" nevertheless admitted that this system alone, without cyclic aspects of measurement, is not enough to provide an adequate structure for cartographic information: "while Stevens' levels deal with an unbounded

number line, there are many measures which are bounded within a range and repeat" [6]. Chrisman added that cyclical measures do not fit the concept of "scale," because angles have a singularity at 360° . He also examined the ordering of the four seasons ("spring-summer-fall-winter") and the fact that the relationships between the seasons are invariant to the starting point of the cycle. He concluded that "any general measurement scheme needs to recognize the existence of repeating or cyclical elements" [6].

In time-cartography cyclical elements are of the greatest importance [7]. To interpret the distant times, contemporary chronology heavily relies on Metonic cycle – a period of about 19 years, after which the lunar phases (defined by the angle between Sun and Moon) recur in the same order. This cycle has been also used for constructing an accurate solar-lunar calendar, reflecting seasonal changes. Ibn Ezra broadened this approach by constructing calendars based on relative angles between various celestial bodies [8]. In the recent Phoenix Clock model, Pluto's and Neptune's relative angles are chosen to provide a basis for a reference clock, which belongs to the family of clocks constituted by a web of relations among all the celestial bodies and the starting points of the cycles [9, 10].

The following text shows that Prokofiev's diaries yield in addition to a traditional timeline a number of measurable life-cycles [3].

2. Collecting data

There were many diarists, and lately diaries became an academic subject of historical studies [11, 12]. So, why Prokofiev and why his diaries are so exceptional?

First, Prokofiev is seen as a symbolic figure of his epoch, and it is said that "the future generations will not be able to understand that difficult and glorious time, which we still have the right to call our own, without <...> pondering over his remarkable life" [4].

More specifically, let us consider several features, which made Prokofiev's diaries unique.

1. Prokofiev led an extremely rich, eventful and creative life and lived in a stormy age. Born in Russia, he traveled extensively throughout the world, visiting, touring or living in the USA, Europe, Japan and Africa. He was acquainted with many well-known people, and his chronological data can be verified by crosschecking with multiple reliable sources.

2. Unlike many artistic diarists, Prokofiev

considered himself as a practical realist and was known for his directness and laconic exactness. His entries are easier to be analyzed because of their impartial and descriptive character. In his diaries even emotions are "objectivized" and pinpointed "as events in his life" [4].

3. Unlike most well-known diarists, Prokofiev did not limit himself to one or two favorite topics, such as weather, travels or amorous experiences. Yet, although his diaries as a whole dealt with multiple issues, his entries periodically changed their character. Some of these changes were gradual, while the others were abrupt. Such Prokofiev's recurrent shifts of interests enable to reveal various rhythmicities in different areas of his life.

4. Prokofiev's literary skills were impressive. In addition to his diaries, he wrote two autobiographies, thanks to which he was named the best autobiographer among the composers [4]. Comparison between his diaries and autobiographies elucidates the main differences between these genres. For instance, the order in which certain events appear in autobiographies is often chosen by artistic and not chronological considerations. It is not so in diaries, when each event is bound by a specific day. The diarist cannot know what will happen tomorrow, and therefore diaries are written as a series of unrelated episodes. On the contrary, in the biographies each event becomes an integral part of a certain narrative and it can be even blurred up in the light of future developments. As a rule, biographers use coarser scales for their life-mapping than diarists; therefore diaries can disclose certain rhythmicities, missed by biographers.

5. According to the Phoenix Clock model, Prokofiev belonged to a very rare kind of generations whose historical mission was to become precursors of new paradigms [9]. Strikingly, he intended to keep his diaries right from his childhood as if he apprehended his personal life to be special, meaningful and different from that of the previous generations.

3. Prokofiev and the History of Music

Like the historical sciences in general, the history of music reminds a description of a random collection of events flowing as a chaotic stream. Nevertheless, many researchers notice rhythmical fluctuations throughout the history of music, when "periods of complication and innovation are followed by periods of simplicity and consolidation, which are then in time followed by more complication

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again" [13]. These fluctuations are accompanied by significant differences in the birth rate of influential composers [14].

Historians in various fields of science and arts are surprised by the enormous contribution of the innovative ideas proposed by the generation born between the years 1885-1900. In music, specifically, this generation brought "the explosion of popular songwriting" and birth of the film music [15].

According to the Phoenix-clock model, this is not accidental. A detailed examination reveals that once in 493 years (the so-called Phoenix Year), when the observed angle between Neptune and Pluto is less than 10° (the so-called Phoenix Hour) there are dramatic changes in societies, accompanied by peaks in the birth rate of passionately creative people. Significantly, the latest Phoenix Hour occurred during the described period between 1885 and 1900, with the exact Pluto-Neptune conjunction taking place in 1891, the Prokofiev's birth year [16].

It is more difficult to follow the history of music than, say, poetry, because we cannot replay its original ancient sounds. Nevertheless, a detailed analysis based on the modern courses of musicology was recently carried out and showed that qualitatively, the traits of musical developments match those revealed in the other creative areas [3]. To elucidate Prokofiev's place in the history of music we shall outline the three most important Phoenix Hours for musicians.

The early roots of the Western music go as far as the Phoenix Hour about 580 BC, the time when Pythagoras was born. It is impossible to overestimate the influence of his mathematics and philosophy on all the future history of music. In short, we owe the modern theories of music to the Phoenix-born Pythagoras who tried to figure out what music was, how it might relate to the cosmic laws, and "especially its relationship to the heavenly bodies of the planets and stars" [15].

During the previous millennium, the first Phoenix Hour (c. 1380-1409) was heralded by birth of the future precursors of the early Renaissance. In those years the most influential English composer of all times, John Dunstable (c. 1390-1453) was born. His role in music was defined as "the musical revolution that occurred in around 1400" [15]. The ancient 7-notes musical scale was replaced by 12 notes in octave. Together with such composers as Guillaume Dufay (c. 1397-1474) and Gilles Binchois (c. 1400-1460), Dunstable became one of the fathers of the

polyphonic music.

Prokofiev, like the two "fathers of music for films" – the celestial twins Irving Berlin (1888-1989) and Max Steiner (1888-1971), was born during the next Phoenix Hour (1885-1900). Due to these composers, music became the soul of cinema, and thanks to cinema, large-scale orchestral music finally reached listeners in the world's most remote corners. Furthermore, due to Prokofiev's "groundbreaking collaboration" with the film director Eisenstein (1898-1948) and due to his original score for "Alexander Nevsky," film music has become an advanced form of opera and ballet [15]. Eisenstein thought that Prokofiev's innovativeness made him "kin to the masters of early Renaissance" [4]. Strikingly, Eisenstein felt it necessary to compare Prokofiev's passionate search with that experienced by the previous Phoenix-born generation, half a millennium earlier.

Speaking about different Phoenix Years, we may illustrate the differences between them by comparing Prokofiev with another famous composer Igor Stravinsky (1882-1971). Although Stravinsky was just nine years older than Prokofiev, these composers were not, strictly speaking, contemporaries, because Stravinsky belonged to the previous Phoenix Year. In his diaries Prokofiev often mentioned their differences, and they were summed up by the composer D. Kabalevsky: "The tendency <...> to couple Prokofiev's name with that of Stravinsky's was extremely misleading, for the paths of these two composers could hardly have been more different" [4]. For instance, Stravinsky had not composed the film music, and listening to the new rhythms, he still could not imagine "how massive the forces of change were going to be" [15].

Concluding this section we should notice that while the Phoenix Clock scale is comparable with the generational traits, it is too coarse for personal lives measurements.

4. Various Rhythms in Prokofiev's Life

Life as an evolutionary process is connected with a set of various rhythms. To describe the dynamic processes in Prokofiev's life we should consider which sets of referent clocks could be suitable.

First, Prokofiev's chronological, biological or social aging began right from the moment of his birth and was correlated with the corresponding Sun's position on the ecliptic. Let us call this Sun's position as the starting or birth point (BP) in the

cycle. Qualitatively, during his entire life, each time when Sun crossed the BP, Prokofiev (like many people) had a very "special day" when he celebrated his birthday. Quantitatively, each time when the Sun crossed BP, Prokofiev grew older by a "solar year." This numerical solar age played a very important role in his life: it defined such crucial decisions as when he should be sent to a gymnasium, drafted into the army or sent to retirement.

By the same token, we can examine additional planetary cycles, when for all the clock readings, the same starting point BP in the cycle is chosen, and the clock readings are defined as angles made by the current positions of the corresponding planets and the BP.

Pluto and Neptune are moving slowly, and they have never crossed BP during Prokofiev's life. Mercury and Venus are moving almost as fast as the Sun, and the differentiation between their cycles and the solar cycles remains inconclusive. It leaves us with four planetary cycles (Uranus, Saturn, Jupiter and Mars) to be considered.

Limitations of space allow just a few words about each of these four planetary cycles:

Being the slowest planet of all the four, Uranus crossed BP only once in Prokofiev's life, during 1935-1937. This beginning of a new "Uranus year" divided the composer's life into two sharply different halves: the first one, when he lived as a free path-seeker and the second one, when he was a soviet citizen in the USSR.

Saturn crossed BP during 1910-1911 and 1939-1941: once during each Uranus year. Both new "Saturn years" were manifested by painful losses, by necessity to determine a new direction in life and by fears of the future. Nevertheless, belonging to different Uranus years, each of these periods was colored differently. Like Babushka dolls, where each successive doll is encapsulated in the doll larger than it, the shorter Saturn years and the longer Uranus years formed sort of a "nested hierarchy."

Jupiter's crossings of BP divide Prokofiev's life into five distinct "Jupiter years," which are exactly fitting the periodicity traditionally mentioned by Prokofiev himself as well as by his biographers.

In the beginning of his first Jupiter year (1892) Prokofiev began to talk. The rest of this cycle (1892-1904) was associated with his childhood in a small village. In the beginning of the second Jupiter year (1904-1916) Prokofiev left his birth-place and moved to St. Petersburg, where he entered the

Conservatoire. His third Jupiter year (1917-1928) matches Prokofiev's leaving Russia for the USA and the following period of wanderings abroad. During his fourth Jupiter year (1928-1940) Prokofiev was in a transitional period before his final moving to Moscow. In the beginning of his fifth Jupiter year (1941-1953), Prokofiev with his second wife was evacuated from Moscow, leaving his first wife and their two sons behind. After the war, Prokofiev spent the rest of his days trying to adjust himself to the Soviet realities.

Mars crossed BP 32 times. With the exception of Prokofiev's babyhood and a few times when the data is missing, during each "Mars year" Prokofiev experienced recurring patterns of fluctuations in his level of activities. Contradicting the common belief that Prokofiev's fabulous diligence implied continuous hard work, his diaries reveal that each time when angles between the position of Mars and BP were about 0° , 90° or 180° , his activities were hectic: his work was fervent, but the results were mostly ambiguous. On the contrary, when such angles were 60° or 120° , his activities were harmonious and their success was unhampered. During the intermissions between these angles Prokofiev often could not force himself to initiate anything. As the years passed he learned to make breaks and then to come "back to work again and again" [4].

It was believed that the secret of Prokofiev's success was that "he felt the heartbeat of Time" [4]. From Prokofiev's diaries we learn that his "Time" was not evenly flowing, and that its topography was not homogeneous. His "Time" was coordinated not with an arbitrary one dimensional time-axis, but rather with the complex hierarchic system of various planetary cycles. Further temporal analysis of Prokofiev's life confirms that his life might be presented as a juxtaposition of various processes described by their specific reference clocks. Previously I termed a set of such reference clocks as "Time Codons" (TC) [16]. It was also shown that when a set of reference clocks is chosen correctly, TC model can reveal hidden order in seemingly incommensurable historical data. Now we can emphasize that to become an effective tool for the biographical studies, such TC should reflect natural laws of stable processes, observable over a suitably large scale. Notably, the stability of the planetary trajectories and their observability make planetary cycles promising candidates for such role.

Paying tribute to Prokofiev's poetical imagination and his interest in the Elements, it would be

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more effective if we would enrich quantitative chronological approaches to his diaries with the poetic logic of the four traditional Elements.

5. Prokofiev and the Four Elements

From ancient times the concept of the four elements – Fire, Earth, Air and Water – has been almost as fundamental as that of the four seasons. For many centuries it provided a basis for describing the material world as well as the four basic human temperaments. This concept was further developed by Empedocles, Hippocrates and Galen. The psychiatrist C. G. Jung used this concept to create his new depth psychology, and the philosopher Gaston Bachelard regarded the four elements as the "hormones of the imagination" [17]. There were many various theories regarding the Elements, but in some curious way, the very fact of their existence became accepted in humanities as granted, dispensing it from any further need to be examined experimentally.

The recent pilot works in this direction reveal a connection between the Elements, one's birth date and the type of dominating images and feelings in one's life [10]. From this viewpoint, Prokofiev's diaries constitute a source of the greatest significance as they provide first-hand information about Prokofiev's daily associates, and what impact each of them had on him.

Born in the Element of Earth, Prokofiev valued mostly earthly images and things. The most important people in his formative years, such as his mother and his first governess, his first tutors (Pomeranzev and Glier) and professors (Lyadov, Chernov, Tcherepnin) belonged to the Element of Earth. Furthermore, his most significant and life-long friend Myaskovsky, his first fiancé Nina and his second wife Mira were also Earth-born

A very different kind of relationships was typical with his Fire-born acquaintances, such as the prominent composers Taneyev and Glazunov, the famous impresario Diaghilev or the conductor and publisher Koussevitzky, each of whom became a source of his professional aspirations and motivations.

In sharp contrast with the two previous groups, with his Air-born friends, such as Eisenstein, Stravinsky or Oistrakh, the relationships were mostly on the intellectual level. The same was true about his first wife Lina, who was highly appreciated for her intellectual skills.

On the contrary, Prokofiev's relationships with his Water-born father and acquaintances were colored

with intense feelings. He was either passionately attracted to them (the chess player Capablanca) or unreasonably disliked them (the violinist Saminsky). Since Prokofiev tried to avoid emotional situations, there were fewer Water-born people in his vicinity than Earth-born friends.

6. Conclusions: "Teach us to number our days" (Psalm 90)

At the first glance, this paper, based on Prokofiev's diaries, might look as a set of various time models using different reference clocks, scales and even logic. Yet to be understood in a coherent manner it should be regarded as a whole. I hope that such a holistic approach will open a promising avenue of historical research and stimulate further explorations in this new and exciting field of biographical measurements.

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