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The Hypothesis of Nostradamus's Use of Cryptographic Methods to Arrange Quatrains in the "Prophecies"

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Abstract: Despite the extensive bibliographical material, scientific study of the life and work of Nostradamus has only relatively recently begun. Currently, it includes a detailed examination of the predictor's biography and historical-philological commentaries on the quatrains. The unordered arrangement of the quatrains is one of the main problems hindering the understanding of the prophecies. In particular, it has been discovered that many quatrains describe presumed future events through comparison with the past and, therefore, cannot be adequately understood without a reasoned arrangement by dates. Although Nostradamus himself unequivocally states in an epistle to King Henry II that the quatrains should be arranged using the biblical chronology he provided, with a reference point determined by the retrograde movements of planets (1606 year, as shown by prof. Brind'Amour), discussions of such cryptographic approaches were absent in Nostradamus literature until now. For the first time, this work presents a detailed argument for the hypothesis that Nostradamus used a modified "scytale" algorithm to encrypt the correct sequence of quatrains and assign them specific dates. It is shown that the predictor indeed employed cyclically repeating biblical chronologies placed in the epistle to King Henry II for this purpose. The final date of the prophecies turns out to be the year 2242, close to the end of the 6,000 years in the Jewish calendar (2240 AD) and the completion of the cycle of planetary epochs in the astrological concept of Abraham ibn Ezra (2241 AD), which aligns well with existing historical research. The analysis results indicate that although the Prophecies were published in parts, they form a coherent work following a strict plan. Consequently, the obtained results are relevant to the history of cryptography in Europe and have significant implications for a correct understanding of Nostradamus' texts.

Keywords:

Nostradamus, prophecies, quatrains, centuries, cipher, chronologies, scytale, cryptography, steganography, planetary cycles

1. The multi-layered nature of the *Prophecies* and the problem of 'elusive meaning.'

Despite the widespread popularity of the Nostradamus' *Prophecies* [\[1,2,3\]](#) and the extensive bibliographic material associated with them [\[4,5\]](#), the scientific study of the life and work of the French fortune teller only began relatively recently. At the moment, the biography of the seer has been studied in detail [\[6,7\]](#), and historical and philological comments on the quatrains have been compiled [\[8,9,10\]](#). An unexpected result of these studies was the conclusion that, in many cases, the quatrains text is not informative enough. On the one hand, it is difficult to associate a large group of quatrains with any events, as their plots are either too bland or, on the contrary, too surreal. On the other hand, it turns out that quatrains often describe events preceding the first publication of the *Prophecies* in 1555. Nostradamus likely believed in the repeatability of historical events, describing the supposed events of the future by comparing them with the past. However, without arguments about linking these quatrains to future dates, they do not seem predictive and even create the impression of a hoax. Given these facts, Professor Denis Kruse radically states: *"Nostradamus wrote quatrains without understanding what they mean. Even if we assume that the predictive text was endowed with meaning, it loses it, filling the reader with a sense of [their] own helplessness and sinfulness [...] Nostradamus makes it clear to his reader that [they] must boldly look beyond the words"* [\[11\]](#). Note that the confusing structure and vague content of the prophetic text and the retroactive description of past events may well serve as indirect signs of its use as a carrier of a hidden message.

The middle of the sixteenth century in Europe was marked by an increasing interest in developing secret writing methods. A simple "scytale" cipher has been known since Ancient Greece, in which a paper tape

is wound around a cylinder, after which the text is written on the tape along the cylinder's axis. It is enough to select a cylinder of a suitable radius to decrypt such a message. The "Caesar cipher" was also known as an encrypted message obtained by replacing the letters of the original message by shifting a given number of positions in the alphabet. In 1518, the *Polygraphy* by Johann Trithemius was published, describing several new, more advanced ciphers [\[12\]](#). Around 1499, the same abbot Trithemius wrote *Steganography*, which was included in the index of forbidden books and partially published only in 1606 [\[13\]](#). In 1550, the Italian Gerolamo Cardano proposed a new method of steganography, the so-called "Cardano lattice" [\[14\]](#). In 1553 and 1555, that is, almost simultaneously with the first publication of Nostradamus' *Prophecies*, Giovan Bellaso proposed an important improvement to the Caesar cipher—an algorithm for replacing the letters of the original message by a given repetitive sequence of shifts in the alphabet [\[15\]](#), which can be expressed by a set of numbers or a mnemonic keyword. The general intention of the above-mentioned and some other authors (Leon Battista Alberti, Giambattista della Porta, etc.) was to improve existing cryptography methods. At the same time, the researchers' thoughts developed in two directions—on the one hand, the creation of encryption methods resistant to decryption (cryptography), and on the other hand, the invisible embedding of hidden messages in ordinary texts (steganography).

Recent papers [\[16,17\]](#) present the results concerning detecting a graphic cipher in Nostradamus' *Prophecies* and propose approximate methods for recovering encrypted images. It turned out that the coordinates of words or letters (century number, quatrain, quatrain lines) carry information about the elements of the images. The images themselves show mostly human faces, executed in a manner reminiscent of modern surrealism. It is worth noting that such a cipher is unique, especially for the sixteenth century, so its development represented a new word in steganography. Therefore, the encrypted images may be formal (for example, an image of a human eye or a cat's head), which we obtained in some cases. Along this path, improving pattern processing methods and attempts to recognize encrypted faces in a historical context remain relevant.

This work aims to show that Nostradamus' hidden message is by no means limited to a graphic cipher. Nostradamus himself, in an epistle to King Henry II of France, unequivocally states that the biblical chronology given by him with a reference point determined by the retrograde movements of the planets (1606, as shown by Professor Brind'Amour [\[8\]](#)) should be used for the arrangement of quatrains: "*I have calculated and calculated the real prophecies entirely according to the order in [this] chain, which contains my own cycle, all through astronomical teaching and my natural gift.*" Although the numerical "chain, which contains its own revolution" is easily associated, for example, with a cyclically repeating sequence of shifts in the Bellaso algorithm, there is no reasoned discussion of such cryptographic hypotheses in Nostradamian literature.

Here, we come into contact with a philosophical problem concerning the criteria of the truth of scientific knowledge. The leading criterion is considered the confirmation of hypotheses and theories based on the coincidence of the consequences arising from them with the observed reality [\[18\]](#). Therefore, assessing statistical significance, non-randomness, or any coincidences (the repeatability of observed facts, the coincidence of theory with experiment, the coincidence of experiments or consequences from different theories with each other) is always at the heart of science. Often, such non-randomness can be accepted as evident. Otherwise, estimates of random realizations must be performed within the framework of a statistical approach. The analysis of statistical anomalies is, among other things, one of the main methods of cryptanalysis [\[19\]](#), but the Nostradamus cipher is too specific to use any standard techniques. Nevertheless, the methodological feature of this work is the author's desire to obtain maximum information from the analysis of statistical anomalies in Nostradamus' texts. This approach seems to be the most adequate for solving the task.

2. Discussion about the end date of prophecies.

Before proceeding to the search for the cipher, it is necessary to discuss the period in which the *Prophecies* were calculated. Discussions of the end date are based on several statements by Nostradamus in epistles to his son César, King Henry II, as well as in quatrains:

1. *"I have compiled books of prophecies [...], this is continuous divination, from the present moment to the year 3797"* (from a letter to César).
2. *"The planet Mars has completed its epoch [...] And now we are led by the Moon, with the help of the full power of the eternal God, until she completes her circle; the Sun will come, and then Saturn. For according to the heavenly signs, Saturn's reign will return..."* (from a letter to César)
3. *"Although we are in the seventh thousandth number, which completes everything, we are approaching the eighth [...] where the great eternal God will complete the cycle"* (from a letter to César)
4. *"I was thinking of leaving records of the years, cities, towns, regions where most [events] [...] will take place, reaching the very [The Second] coming, which will happen later, at the beginning of the seventh millennium"* (from a letter to King Henry).
5. *"The renewed Kingdom of Saturn will come, and the Golden Age. God the Creator will speak, heeding the sorrow of his people, Satan will be taken and bound in the abyss of the abyss in a deep pit: and then universal peace will come between God and people, and [Satan] will remain bound for 1,000 years"* (from a letter to King Henry).
6. *"20 years of the reign of the moon have passed, / In the year 7000 another will take over / When the Sun ends its tired days, / Then my prophecy will be completed and fulfilled"* (C1K48).
7. *"At the end of the great seventh day / The hecatomb games will take place / Shortly before the great thousandth milestone / When the dead will come out of their graves"* (C10K74).

The commentators' discussions are because although some of the above statements agree well with each other, other statements, at first glance, contradict them. The argumentation used below is borrowed mainly from books and articles by historians Pierre Brind'Amour [\[8,20\]](#), A. Penzensky [\[4,10\]](#), and P. Ginar [\[21\]](#).

In Nostradamus' quotations 3 and 7, it is stated that the history of the modern world will end at the end of the "seventh thousandth number." It follows from quote six that the prophecies end in the year 7000, along with the end of the age of the Sun—therefore, from a comparison with statements 3 and 7, it is logical to think that the "seventh thousandth number" corresponds to the year 7000. It follows from quote two that after the age of the Sun comes the age of Saturn. Phrase 5 connects the beginning of the age of Saturn with the start of the 1,000-year reign of Christ when Satan will be bound. Thus, the prophecies extend to the Second Coming, which is expected at the end of 7,000 years from the world's Creation.

However, quote four unexpectedly states that the Second Coming will occur at the beginning (and not at the end!) of the seventh millennium. At the same time, from statement 1, when compared with 4 and 6, it formally follows that either the beginning or the end of the seventh millennium falls on the year 3797. The reason for the apparent discrepancy is Nostradamus' increased caution. The predictor expresses himself openly and consistently to the extent that his statements correspond to Christian eschatology. At the same time, to avoid accusations of heresy, he masks the specific original date of the onset of the Kingdom of Saturn (the Golden Age, the Second Coming), pointing to it with hints, the understanding of which implies familiarity with the astrological tradition and requires deeper immersion in prophecies.

Thus, in the Epistle to King Henry II (see Appendix), two chronologies with the lifetimes of biblical characters are given, which poses the reader with the problem of dating the Creation of the World.

According to these chronologies, the Creation of the World is dated differently: 4758 BC (I chr.) and 4174 BC (II chr.)

Therefore, the first chronology provides the only opportunity for the final date of the prophecies—7,000 years from the Creation of the World ended in 2242 AD. This date is consistent with the mysterious figure "3797" at the hint level: $1,555 + 2,242 = 3,797$, where 1555 is the year of the first publication of the *Prophecies*. It follows that the number "3,797" is called by the predictor conditionally, while it means the year 2242. The coincidence has the character of a statistical anomaly. Although the researcher may assume that the correct understanding has been achieved, the appearance of the same number in two equalities, $4,758 + 2,242 = 7000$ and $1,555 + 2,242 = 3,797$, could have happened by chance. If we still assume that the coincidence is not accidental, then phrase four from the above collection of quotations finds its explanation. According to the Jewish calendar, the year 2242 AD is at the beginning of the seventh millennium (6,000 years from the Creation of the World ended in 2240 AD). When Nostradamus mentions the end of the "seventh thousandth number" in statement 3,7, he means 7,000 years in the chronology system corresponding to the I chronology. When, in statement 4, he speaks of the beginning of the seventh millennium, he already means the Jewish calendar. In our opinion, the proximity of the end date of the *Prophecies* to the 6,000 years of the Jewish calendar could have prompted Nostradamus to resort to methods of disguise to avoid accusations of sympathy for Judaism.

The second chronology formally provides two possibilities for the end date: 6,000 years and 7,000 years from the Creation of the world end, respectively, in 1826 and 2826 AD. If we assume that the prophecies end in 1826 AD, statement 4 finds its explanation, but the rest of the statements are unclear. If we assume that the final date is 2826 AD, statements 1 and 4 are vague. Thus, the second chronology falls out of the semantic context and is given, in our opinion, solely for a technical purpose as a key to the arrangement of quatrains (see the following sections).

These arguments are valid regardless of the meaning given to planetary epochs in statements 2,5,6. Meanwhile, historians have found the meaning of the concept of "planetary epochs" in Nostradamus' modern astrological beliefs. In particular, statement 2 is compared with a quote from the astrological treatise of Richard Russa ^[22]: *"After the third time, Mars ruled until 6732 and 4 months, and at the end of his reign, the Moon began a reign that should last 354 years and 4 months, until 7,086 years and 8 months, and after it, the Sun will rule until 7441, and after the Sun, Saturn should rule for the fourth time if only the world will not end its existence and will not come to an end."* At the same time, Russa dates the Creation of the World to 5200 BCE, according to Eusebius of Caesarea, from where the year 7441 AD, named by him, corresponds to 2241 AD. It can be seen that this result is entirely consistent with the assumptions made above regarding the end date of Nostradamus' prophecies. Of course, Russa himself was not the author of this astrological concept. The idea of planetary epochs repeating in sequential order, lasting 354 years and 4 months each, belongs to the Jewish philosopher and astrologer of the twelfth century, Abraham ibn Ezra, to whom Russa refers. Also, at the beginning of the sixteenth century, this idea found authoritative support in the treatise of Abbot Trithemius ^[23]. Therefore, Nostradamus had every reason to accept this concept as the basis for his calculations.

An alternative point of view on the concept of planetary epochs is presented by the comments of T.W.M. van Berkel ^[24]. According to this researcher, Nostradamus, in statements 2,5,7, could mean not the era of Abraham ibn Ezra lasting 354 years and 4 months each, but the "days" of the great planetary week, where each millennium is assigned one day and some planet in a similar sequence. In this case, the new Kingdom of Saturn corresponds to the onset of the eighth millennium and does not carry any additional semantic load. The date "3797" can be searched for somewhere in the eighth millennium according to the chronology II (why exactly according to it?) The coincidence of the year 2241 from the treatise of Russa with the end of 7,000 years of the First chronology of Nostradamus should be considered accidental, as well as the "hint" of the year 2242, arising from the equality of $1,555 + 2,242 = 3,797$.

In our opinion, van Berkel's concept does not look convincing—not only because it ignores significant coincidences of numbers. At the same time, it in no way explains the remarkable accuracy of the number 3,797 but also because it does not allow us to explain quote six. Indeed, Nostradamus claims that when writing the *Prophecies*, 20 years of the Moon era had passed. When subtracting two planetary epochs (Sun and Moon) of 354 years and 4 months from 2,242, we get 1,533. Considering that the quatrain C1K48 was first published in 1555, it is logical to assume that it was written in 1553, or the number of 20 years is named in it in a rounded manner, but in any case, Nostradamus here refers the reader specifically to the cycles of Abraham ibn Ezra, and not to the millennial periods. Another thing is that Nostradamus arranged the first chronology in such a way that the seventh millennium ended in 2242 AD. Consequently, both the new Saturn epoch (354 years and 4 months) and the Saturn Millennium (Golden Age) will start from this year.

3. The hidden connection of Nostradamus' chronologies with real-time dates.

In the Epistle to King Henry II, two chronologies of biblical events are given (see Appendix), and Nostradamus emphasizes that the calculations provided do not coincide. According to the first chronology, there are 4,758 years from the Creation of the world to Jesus Christ, and according to the second chronology, there are formally 4,092 years and 2 months between these events. However, Nostradamus himself calls 4,173 years and 8 months. The first chronology shows that, according to Nostradamus, 7,000 years from the Creation of the World ended in 2242 AD. Regarding the second chronology, it is said that it is given for a technical purpose: *"I calculate and calculate the real prophecies entirely according to the order of [this] chain, which contains its own revolution, all through Astronomical teaching and my natural gift, and after a while, and understanding by this the time when ..."* followed by a set of retrograde movements of the planets (in the dates of the Julian calendar), which, as shown by Prof. Brind'Amour, clearly indicate the year 1606 ^[8]. Nostradamus borrows astronomical information from the ephemerides of Leowitz ^[25], as evidenced by the coincidence of inaccuracies in the description of the movements of celestial bodies with Leowitz's calculations.

In this regard, the question arises: from what date are the prophecies counted—from their first publication in 1555 or from the year 1606? This article's author has discovered a numerical pattern, based on which it can be reasonably assumed that the prophecies are combined into an integral system with a starting point in 1555, while 1606 indicates rather a "phase" in some cyclical process.

Let's consider that the endpoint of the prophecies is the year 2242 (see the previous section). Assuming the starting point is 1555, we get the time interval of prophecies $2,242 - 1,555 = 687$ years. It turns out that the lengths of both chronologies, when divided by this interval, give in the remainder the number of years indicating the year 1606 "from above" and "from below," respectively:

$$2242 - (4758 \bmod 687) = 1606$$

$$1555 + (4173 \bmod 687) = 1606$$

The resulting pattern is illustrated graphically in Fig.1.

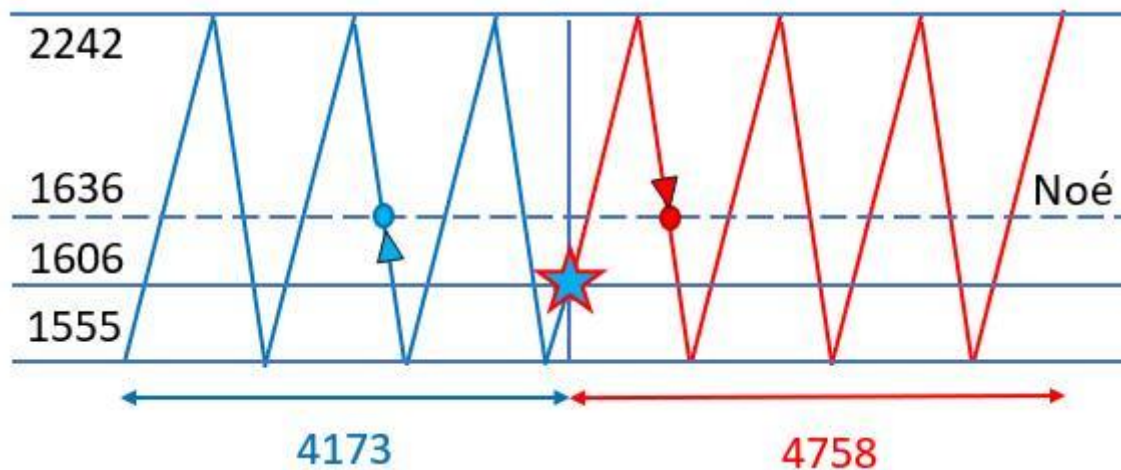


Fig.1. A diagram to illustrate a numerical pattern: the remnants from dividing the lengths of the first (4758) and second (4173) chronologies into the interval of prophecies ($2242 - 1555 = 687$) indicate the year 1606 "from above" and "from below," respectively. In addition, when starting from 1606, in both chronologies, the "birth of Noah" corresponds to the same real-time date (1636).

Now, let's look at some dates in the chronologies.

According to the first chronology, "the first man Adam appeared about 1,242 years before Noah," in other words, Noah was born 1,242 years after the world's creation. According to the second chronology, "1,506 years have passed from the world's creation to the birth of Noah." Thus, the numbers contradict each other. Brind'Amour drew attention [\[8\]](#) to the fact that both figures were obtained by distorting those known from the Bible. Indeed, according to the Lucian edition of the Septuagint (used by Eusebius of Caesarea) and the reconstruction based on it in the Vatican Codex, the flood dates back to 2242 CM, which differs only in the first digit from the number named by Nostradamus in the first chronology. If we assume that there is a typo or error in Nostradamus's text, it should also be recognized that we are not talking about the birth of Noah but specifically about the flood at the time when Noah turned 600 years old. However, below this chronology, Nostradamus stipulates that his calculation differs from that of Eusebius of Caesarea.

The second chronology looks even more suspicious when it comes to typos. The number 1,506, named by Nostradamus, differs only in the permutation of digits from the number 1,056, which is calculated based on the book of Genesis (chapter 5). At the same time, instead of the sum of the chronology years named by Nostradamus (4,173 years and 8 months), when summing up the dates of the chronology, 4,092 years and 2 months are obtained. In this regard, Brind'Amour notes that the named amount can (very approximately) be obtained if, based on the *Book of Genesis*, 1,506 with 1,056 are replaced, as well as add time intervals missed in chronology (477 years from the completion of Temple I to the completion of Temple II according to Jewish tradition, 40 years of Jewish wandering in the desert, 7 years and 6 months of the construction of the temple of Solomon).

However, maybe Nostradamus deliberately distorts known numbers to obtain additional degrees of freedom based on the needs of his cipher. Following the scheme shown in Fig.1, we count 1,242 and 1,506 years, in the first and second chronology, respectively, starting from 1606 and taking into account the boundary conditions of 1555 and 2242, upon reaching which there is a change in the direction of counting years along the real-time axis. As a result, for both cases, we come to the same (!) date, 1636 CE (see Fig.1). Thus, the expected identity of the two dates denoting (as stated) the birth of Noah is realized precisely in the cipher system we propose, while the search and elimination of typos do not solve this problem.

The discussion of the remaining dates of the chronologies at the moment goes beyond the scope of logical analysis. At the same time, according to the author, the results obtained are sufficient to consider the statement about Nostradamus' use of a simple cipher scheme for sorting dates to be justified (Fig.1). This scheme is classified as a modified "scytale" cipher using a key sequence of shifts (similar to the Bellaso cipher) instead of a fixed key. Based on the presented scheme, it can be reasonably argued that the prophecies extend over the time interval 1555–2242, with 1606 acting as the common starting point of the two chronologies, while the "birth of Noah" indicates the starting direction of counting years in each of them along the axis of real-time. Although the scheme presumably establishes a connection between the chronology numbers and real-time dates, it leaves the question of how the resulting list of dates is aligned with the quatrains. The next section of the article is devoted to this problem.

4. The hidden connection of chronologies with the order of quatrains.

The simplest way to establish a relationship between the numbers of chronologies and the ordinal numbers of quatrains is to take one quatrain in one year and count the quatrains by a periodically recurring series of numbers from the chronology, starting from some starting point. Then, depending on the choice of the starting point and boundary conditions (periodic or mirror), several options for the arrangement of quatrains arise, from which the correct one should be chosen. However, no results have been obtained on this path so far. D. Hamatulin [\[26\]](#) proposed the idea of counting the letter combinations *an* instead of counting the quatrains themselves (the word *an* translates from French as "year") in prophetic texts. Unfortunately, this analysis did not consider discrepancies due to typos between editions, and that is probably why the patterns that most clearly indicate the presence of a cipher were not noticed within its framework.

First, it is necessary to determine which sources are preferable for carrying out such calculations and which calculation method to choose. Due to typos made by the publisher, even copies corresponding to different proofs of the same publication can lead to different results, not to mention different editions. If you do the proofreading yourself, eliminating the most obvious typos, then it is difficult to avoid suspicions of rigging the results.

As you know, the *Prophecies* were published in three parts: in 1555, a Letter to César and the first 353 quatrains were published; in 1557, along with the previous quatrains, 289 new ones were published, and finally, the well-known edition by Benoit Rigaud, in which, together with the earlier prophecies, the epistles to King Henry and the final 300 quatrains were published, dated 1568. The 1555 edition is known in two copies (kept in Vienna and Albi), which differ little. The 1557 edition is known in three copies, of which the most reliable is kept in the library of Utrecht, and the other two ("Moscow" and "Budapest") are presumably pirated copies [\[4\]](#). Finally, the 1568 edition is known in several versions, facsimiles of which (however, as well as facsimiles of previous editions) can be found in the electronic library on Mario Gregorio's website [\[27\]](#).

On the one hand, it is reasonable to assume that the first editions should be considered more adequate for counting words or letter combinations, as Nostradamus himself could participate in the proofreading and rely on previously published texts in his further work. Then it is logical to consider the Letter to César and the first 353 quatrains according to the 1555 edition (for certainty, "Albi"), the following 289 quatrains according to the "Utrecht" copy of the 1557 edition, and finally, the Letter to Henry II and the final 300 quatrains according to one of the versions of the 1568 edition (for certainty, the version 1568-004 (Chomarat: A6587) from the Mario Gregorio library; versions 002, 003, 005, 006 differ slightly from it). On the other hand, if we assume that Nostradamus managed to take part in preparing the 1568 edition, earlier inaccuracies could be corrected in this edition. For comparison, we also calculated the 1597 edition, made by the heirs of Benoit Rigaud. In addition, the situation is considered when the "Letter to César" and the first 353 quatrains are taken from the "Utrecht" copy of the 1557 edition, i.e., the first edition (1555) does not participate in the summary calculation. The results of the calculations of the letter

combinations *an* in various publications are summarized in Table 1. The rightmost column of the table shows the expected set of correct numbers.

	Summary of the editions of 1555, 1557, 1568.	According to the edition of 1568	According to the edition of 1597	Summary of the editions of 1557, 1568 (D.Hamatulin)	The assumed series of correct numbers
Letter to César	155	153	153	152	155 (153)
I c.	210	211	209	209	210
I–II c.	453	454	455	449	453
I–III c.	676	676	677	668	676
I–IV c. (353 quatrains)	777	778	779	771	777
I–IV c. (400 quatrains)	890	888	891	883	888
I–V c.	1113	1111	1116	1106	1111
I–VI c. (599 quatrains)	1329	1326	1330	1322	1326
I–VI c. +warning	1331	1328	1332	1324	1328
I–VII c.(642 quatrains)	1426	1424	1427	1419	1424
I–VIII c.	1661	1659	1663	1654	1659
I–IX c.	1862	1860	1863	1855	1860
I–X c.	2089 [2087]	2087	2087	2082	2087
Letter to César and I–X centuries	2244 [2242]	2240	2240	2234	2242 (2240)
Letter to Henry	325	325	325	325	325

Table 1. The results of counting the letter combinations *an* according to various editions of the Prophecies. Numbers that appear to be non-random are in bold (see the explanations in the text). The amounts shown in square brackets [*] do not include the unnumbered quatrain 6–100 ("warning to critics").

Let's discuss the main features of the performed calculation.

(1) The 353 quatrains of the first edition of the Prophecies (1555) contain 777 letter combinations of *an*. Given the popularity of the number 7 in Christian symbolism, where it expresses perfection and completeness, it can be confidently argued that the appearance of this number when counting is the result of the author's intention, i.e., Nostradamus counts the letter combinations *an*.

(2) The letter to César in the same edition (1555) contains 155 *an*, which may serve as a hint at the date of its writing and the starting point of the prophecies, i.e., 1555.

(3) There are 888 *an* in the first to fourth centuries and 1111 *an* in the I–V centuries—according to the 1568 edition. These numbers seem correct because they continue the logic of the first edition, where the number 777 was used. Nostradamus continues to highlight the correct numbers in a unique way. The "Utrecht" copy (1557) and the edition of the heirs of Benoit Rigaud (1597) somewhat distort these amounts.

(4) The total number of letter combinations *an* for all quatrains of the I–X centuries in the editions of 1568 and 1597 turns out to be the same and amounts to 2087. In the summary count for the editions of 1555, 1557, and 1568, the same figure of 2087 arises if the only unnumbered quatrain 6–100, written in Latin ("warning to critics"), is not considered. The number 2087 seems correct and remarkable because when multiplied by two, 4174 is obtained—a number that coincides with the length of the second chronology (4173 years 7 months). This corresponds to the mental image that the chronology is counted from the beginning of the quatrains to the end and then returns to the beginning ("contains its own cycle," as

Nostradamus himself notes in its description). In other words, using a modified scytale algorithm is again possible.

(5) If we consider together the Letter to César and the Quatrains of the I–X centuries, we get $153 + 2,087 = 2,240$ *an* (according to the editions of 1568 and 1597). If we use the number 155 for the Letter to César, which was discussed above, we get $155 + 2,087 = 2,242$ *an*. Both of these numbers have already appeared in Section 2 when discussing the end date of the *Prophecies*. The year 2240 AD corresponds to the end of 6,000 years of the Jewish calendar, and the year 2242 AD corresponds to the end of 7,000 years of the First chronology of Nostradamus. Thus, the predictor again shows that the *Prophecies* are calculated for interval 1555–2242. An interesting consequence is that, apparently, Century VII remains unfinished not because its final 58 quatrains are lost but by the author's intention, as otherwise, the totals 2,087 and 2,242 would not have arisen.

(6) The unnumbered quatrain 6–100, written in Latin ("warning to ignorant critics"), is present in the "Utrecht" copy and subsequent editions, while in the "Moscow" and "Budapest" copies of the 1557 edition, the VI century ends with the 99th quatrain. Thus, in any case, the quatrain 6-100 stands out from the rest. Maybe this is an accident, but the number of letter combinations *an* equal to 1328, corresponding to this quatrain in the 1568 edition, is associated with 1328, is the date of the ascension to the French throne of Philip VI the Fortunate, the first king of France from the Valois dynasty. Although this meaning does not agree much with the features of the cipher discussed above, it is unnecessary to exclude the resulting number's symbolic meaning. Probably, by analogy with the numbers 888 and 1111, Nostradamus uses it as a recognizable "mark," confirming the correctness of counting the letter combinations *an*.

(7) The calculation made according to the 1597 edition is noteworthy in that despite the many corrected typos of previous editions and the appearance of new typos, the total numbers 2087 and 2240 coincide with the 1568 edition. It is impressive how Nostradamus achieved such an accurate calculation of the amount in the publication published 30 years after his death (despite the differences in the positions of the letter combinations *an* that interest us number in the dozens). Perhaps the publisher Benoit Rigaud and his heirs were privy to some of the secrets of Nostradamus?

(8) The summary calculation of the editions of 1557 and 1568, made by D.Hamatulin, in which the "Utrecht" copy (1557) is used for the Letter to César and centuries I–VII, and for Writing to Henry and centuries VIII–X edition of 1568, loses the above patterns. In our opinion, this indicates that the "Utrecht" copy is the least accurate due to corrections and typos made by the publisher.

5. Conclusions.

(i) In previous studies [\[4,8,10,20,21\]](#), it was reliably established that the "Prophecies" of Nostradamus were calculated for the time interval 1555–2242. The end date of the prophecies is close to the end of the 6,000 years of the Jewish calendar (2240 AD).

(ii) The correct sequence of quatrains and their corresponding dates are encrypted. The proposed date encryption method is classified as a modified "scytale" algorithm using a key sequence of numbers instead of a single number. This cipher's starting point (phase of the cyclic process) is 1606, and the key sequence is set by pseudo-biblical chronologies from the epistle to King Henry II.

(iii) The correspondence between the dates of chronologies and the numbers of quatrains is established, apparently, by counting the letter combinations *an* (the French word for "year") in the texts of prophecies. The results of the calculations indicate that although the *Prophecies* were published in parts, they are a complete work, subject to a strict plan.

(iv) Further development of the proposed approach should make it possible to restore the correct order of quatrains and their corresponding real-time dates, which means understanding Nostradamus' ideas about the distant future more deeply.

Application. Chronologies given in the epistle to King Henry II.

I chronology.

"The first man Adam appeared before Noah in about 1242, not counting the times according to the calculations of the Gentiles, as was done in the calculations of Varro, but only according to the Holy Scriptures, and according to the weakness of my mind, in my Astronomical calculations; after Noah, from him and the Flood, Abraham came about 1080 years later, who was the greatest Astrologer, according to some, he was the first to invent the Chaldean script; then Moses came about 515 or 516 years later, and between the time of David and Moses there were 570 years approximately. Then, after, between the time of David and the time of our Savior and Redeemer Jesus Christ, who was born a single Virgin, there were (according to some chronographs) 1,350 years, someone will be able to object that this calculation is incorrect, since it differs from the calculation of Eusebius [of Caesarea]. And from the time of human redemption to the vile seduction of the Saracens, 621 years have passed, about which it is easy to generalize what times have passed; if my calculation is not acceptable to all nations, it is because everything was calculated through celestial movements, combined with an experience inspired in some secluded hours, with an experience from my ancient ancestors."

II chronology.

"I calculated the years from the creation of the world to the birth of Noah – 1506 years have passed, and 600 years have passed from the birth of Noah to the completion of the Ark before the Flood, Lunar or Solar [years] or mixed are given. I believe that the scriptures are based on the Sun. At the end of these 600 years, Noah entered the Ark to escape from the Flood, and there was a worldwide flood on Earth that lasted 1 year and 2 months. From the end of the flood to the birth of Abraham, the number of years passed 295. And 100 years have passed from Abraham's birth to Isaac's birth. From the birth of Isaac to Jacob, 60 years have passed; from the time he entered Egypt to the exodus from it, 130 years have passed. And 430 years passed from Jacob's going to Egypt to the exodus. From the exodus from Egypt to the construction of the Temple by Solomon in the 4th year of his reign, 480 or four times twenty years passed. And from the construction of the Temple to Jesus Christ, according to the chroniclers, 490 years have passed. And so, according to this calculation, which I have done with the help of the Scriptures, it has been about 4,173 years and 8 months, more or less. From Jesus Christ, because of the difference of sects, I skip, count, and calculate the real Prophecies, entirely according to the order of the chain that contains its rotation, all through Astronomical teaching and my natural gift, and after a while, and understanding by this the time when Saturn, which will turn, will enter the 7th month of April until August 25th, Jupiter from June 14th to October 7th, Mars from April 17th to June 22nd, Venus from April 9th to May 22nd, Mercury from February 3rd to February 27th, then from June 1st to June 24th, and from September 25th to October 16th. Saturn in Capricorn, Jupiter in Aquarius, Mars in Scorpio, Venus in Pisces, Mercury in a month in Capricorn, Aquarius and Pisces, the Moon in Aquarius, the Dragon's head in Libra, the tail in the opposite sign, [then] follows the union of Jupiter and Mercury, with the quadrature of Mars and Mercury; the Dragon's head will be with the union The sun and Jupiter, the year will be calm, without an eclipse, nothing else, and it will be the beginning of what will continue from here, and starting this year the greatest persecution of the Christian Church will be committed, which has not yet been in Africa. It will continue until 1792, which will be considered the renewal of the epoch."

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The reviewed article is devoted to the study of the predictive legacy of Nostradamus, in which the author aims to show that in addition to explicit (albeit meaningfully encrypted) information, a more accurate link to modern chronology is necessary for the study of widely known quatrains. To this end, the author studies statistical anomalies in the texts of Nostradamus in order to extract "maximum information" from their analysis. The methodology of the article consists in the use of logical and statistical methods in relation to the study of historical chronology. To do this, the author compares the various chronological scales presented in the texts of Nostradamus, and binds to them the chronological dates mentioned by Nostradamus in quatrains and encrypted by him. The relevance of the work lies in the scientific approach to the legacy of Nostradamus. The article lacks any elements of the medieval scientist's interpretations in the spirit of predictions of the future, widely spread in quasi-scientific and amateurish statements on this topic. The scientific novelty of the article can be considered in the same direction. The rather specific subject of the study also determined the structure of the article, which looks somewhat different from the traditional scientific one, but at the same time remains completely within the framework of the scientific approach. In the first section, the problem of linking Nostradamus' texts to real chronology is posed and a brief historiographical overview of existing works is given, the purpose of the article is set and the criteria for the truth of scientific knowledge are discussed. In the second section, the author examines the essence of the discussion about the time to which the prophecies of Nostradamus extend. Further, in the next two sections, the author, using his own methodology based on statistical comparisons in historical and chronological research, offers his own interpretation of the sequence of quatrains and deciphering their dates. Convincing arguments in favor of the author's statistical observations are provided by Table 1, which contains the results of counting the letter combinations "an" for various editions of the Prophecies. These results allow the author to come to the important conclusion that, although the "Prophecies" were published in parts, they are "a complete work, subject to a strict plan." The appendix contains two small texts by Nostradamus, allowing the reader to imagine the specifics of the material analyzed in the article. Thus, the article is written in accordance with the strict logic of presentation, corresponding to the general logic of the study. It should be noted that the purely scientific and rather complex language of presentation, which will be available to a trained reader. The work contains a fairly complete bibliography (27 positions), designed for a serious scientific study of the problems set out in the text of the article. The article is written in a polemical manner and contains a discussion of issues that are debatable in nature. The author of the article conducted research on texts and substantiation of their binding to a chronological scale on the basis of fairly simple mathematical and logical operations that can make serious changes in the definition of sequences of quatrains of Nostradamus. The generalizations presented by the author concerning the history of cryptography in Europe are also of interest, they are essential for the correct understanding of Nostradamus' texts. The scientific nature of the article is also supported by the fact that the author does not consider the content of the quatrains as prophecies, but calls them "Nostradamus's ideas about the distant future." Of course, the article is not quite standard in nature, but its scientific nature, expressed by the attitude to the legacy of Nostradamus as historical texts and the desire to analyze them by methods of historical chronology, allows us to state the validity of the author's argument and recommend the publication of this work in the journal Historical Informatics.