

Mathematics and Liberature: Fajfer's *Ten Letters*

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Abstract

The article discusses liberature in the context of its mathematical qualities. In this trend which inextricably connects the textual and physical layer of the work, each element in the book is expected to be created according to a certain formula which should bring a holistic piece of literature. After 1999, a great number of mathematically-oriented works have appeared which are strictly library. In the presentation, I base on the theoretical idea behind liberature when discussing Zenon Fajfer's library work *Ten Letters* (Pol. *Dwadzieścia jeden liter*). This innovative piece is analysed mainly from the point of view of geometry and play with numbers, which is visible already in the title: the ten-letter phrase "ten letters." Mathematical qualities are indicated on various layers of the piece: the physical, the textual, and the visual, but especially in its form. The game of numbers is found not only where it is obviously visible and essential to understand the message, but also in places which might not have been intended. Liberature is analysed as literature but at the same time, it is shown *not* to be literature, and in this respect, to be mathematical at the core.

Keywords: form, book, literary text, game, numbers, geometry, defamiliarization

Introduction

The paper focuses on the recent literary phenomenon called liberature in the context of its mathematical qualities. In this artistic trend which inextricably connects the textual and physical layer of the work, each element is expected to be created according to a certain formula which, in turn, should bring a holistic piece of literature. After 1999, with the advent of theoretical and critical insights into liberature both in Poland and elsewhere, a great number of mathematically-oriented works have appeared which are strictly library. In the presentation, I will base on the theoretical idea behind liberature when discussing Zenon Fajfer's library work *Ten Letters* (2010). This innovative piece – which, according to my research, has been (very briefly) discussed only in one scholarly article as yet – will be analysed mainly from the point of view of geometry and

the intriguing play with numbers, which is visible already in the very title: the ten-letter phrase “ten letters.” As it will be presented, both of the mathematical elements enumerated – i.e., the game of numbers and geometry – are inextricably connected with the library construction of the whole volume (including its strictly textual side) as well as of language in Fajfer’s library work. In other words, mathematics is not only present here, but it is used to achieve certain artistic effects. Since liberature is a subtype of literature, the first, most general section of the present article will discuss the connections between literature, mathematics, and liberature.

From mathematics to literature and liberature

It appears difficult to indicate the point at which literature and mathematics cross. After all, these two disciplines are widely considered separate, and their separation seems to be in conformity with common sense. That is to say, literature is generally regarded as a domain of free thought, in which artistic expression is not (or at least should not be) limited by rules as strict as the ones that prevail in mathematics. The scientific discourse of mathematics, on the other hand, is expected to be very clear, consistent, and logical, moving smoothly from a hypothesis put forward *expressis verbis* at the beginning of a work to various necessary calculations, and eventually to the proof and a justified conclusion – and not an unexpected twist or unfounded statement – at the end.¹ Even though literature understood as *belles-lettres* might also be clear and logical, such a limiting structural frame is not – and could not be – put on the literature as we know it, since this field of human activity is supposed to be the epitome of imaginative and textual creativity and originality, or, in a word, a creative art. If it was limited by structural rules as strict as the ones in mathematics, it would probably lose its status of *belles-lettres*.

There are scientists and humanists, though, who believe that a connection between “exact sciences” (especially mathematics) and the literary discourse is not only possible to be established, but also quite clearly visible, even in the places that I listed above as characteristic of *either* one of them or the other. For

¹ This clarity is often noticeable in mathematicians’ manner of academic writing: they usually stick strongly to the point and leave out all unnecessary digressions, and also assume that their reader is generally versed in the subfield with which their paper deals. Humanists, on the contrary, and especially literary scholars, tend to place numerous allusions and associations in the footnotes, even though those added elements may be utterly at odds with the main topic of their article. As a result, humanists’ papers are often full of elongated footnote references which might dim the main train of thought, and only in some cases make it more easily understood for the reader.

instance, Marcia Birken and Anne Coon observe that what ties the two disciplines together are the *patterns* to be found in both, patterns which, as the authors formulate it, “are implicit and explicit” in mathematics as well as in poetry, which Birken and Coon consider to be “two of the most familiar, and sometimes most mysterious, human endeavors ...” (Birken & Coon, 2008, p. 9). Masahiko Fujiwara, a renowned Japanese mathematician with a vested interest in literature, claims that what connects mathematics with the latter is particularly the *beauty of logic* present at the core of them both, a logic strived for and achieved for its pure, and necessarily impractical, beauty: “Mathematics has evolved purely for itself, with the greatest contributions to the field being those theories that put value on the beauty of the adopted logic,” he claims, while “the magnetic force that draws art – and therefore literature – to mathematics is the dignified beauty of its pure logic” (Fujiwara, 2015). A Catalan scholar Dolors Collellmir echoes this stance from her literature-oriented point of view when she claims that “literature, and specifically fiction, ... has a mathematical core, which sometimes is demonstrable and sometimes only suggested” (Collellmir, 2011, p. 22).² Thus, a connection between mathematics and literature is found in what Collellmir calls a mathematical core and what Fujiwara identifies as striving for logic; both the researchers agree that literature is naturally “drawn” to mathematics (although a similar dependence does not occur in the other direction – apparently, mathematics does not base on literature). Birken and Coon add that there are observable patterns in mathematics as well as in literature, and those patterns also appear to be strongly connected to the logic of both the disciplines.

I myself have begun the discussion by pointing out an intersection point between mathematics and literature following certain logic as well, a logic which will enable me to discuss some of the mathematical qualities of literature. In order to begin this discussion, however, a short description of literature needs to be provided. Attempting to define this artistic trend and enumerate its major features, I have to stress that (1) *literature is literature*, and this essential fact is visible in the very name. As a result, most (or all) of the components of a literary piece should be regarded as textual, or at least influenced by the text and harmonizing with it. Secondly, being literature, (2) literature strives for a total unity of a work, and this is achieved by sticking to a certain pattern (e.g. in the so-called emanational poems, which will be analysed later on), and this pattern may be regarded as a limiting structure. The pattern is noticeable in the “total” unity

² Translation mine – Ł. M. The original version reads: “La literatura, y en concreto la ficción, ... tiene un corazón matemático a veces probado, otras sugerido.”

of the library work and the mutually influencing connections between various elements of the piece. Katarzyna Bazarnik and Zenon Fajfer, the pioneers of liberature, point this out in a definition which states that:

"Liberature is a kind of literature in which the space of the book (Lat. liber), hitherto perceived by the author and the readers as if in the Newtonian framework, as semantically neutral and static, becomes integrated into the orbit of the word while simultaneously influencing it. Here the matter of the statement belongs to the space of the book, and the space of the book to the material of the statement: the text and the surface of the volume constitute an integral Whole, just as matter, energy, time and space constitute an inseparable wholeness. Liberature is total literature, 'a total expansion of the letter'" (Bazarnik, Fajfer, 2010, p. 125).

In other words, the main characteristic of liberature – and one which clearly distinguishes it from literature – is its holistic nature, based on the book as an object which is by no means transparent. A library work is a textual book and it is a "bookish" text. Beside this, the physical space is essential to the textual form and to the content expressed by both the text and all the extra-textual components of a work. This characteristic, however, gives rise to an issue which may be considered problematic as regards the first feature of liberature enumerated above.

In the theoretical-artistic library manifesto *Liberature: Appendix to a Dictionary of Literary Terms* from 1999, Fajfer expresses his hope that "the whole world can be contained in one Book, expressed in one Equation, explained by one all-embracing Theory" (Fajfer, 2010b, p. 22). This mathematical unity of the perfect Book connects various elements of the literary work, typically dispersed, such as space, time, the body, materiality, and the visual layer. Although it might seem paradoxical and at odds with the first statement (that liberature is a subtype of literature), in this respect we have to claim that (3) *liberature is not literature*. Even though liberature is, in principle, more "liberal" – and therefore even more "creative" – than literature (Latin *liber* means not only "the book" but also "free"), I will argue that what liberature is instead of literature is, in a great part, pure mathematics which can appear on the spatial, temporal, bodily, material, and visual layers. In other words, in the places where liberature is not literary, it is often mathematical. Thanks to this characteristic of liberature, I was able to title this paper "Mathematics and Liberature" – because liberature is mathematical and mathematics in library, but (what is rather obvious) literature itself is *not* mathematics and mathematics is not literature. Although

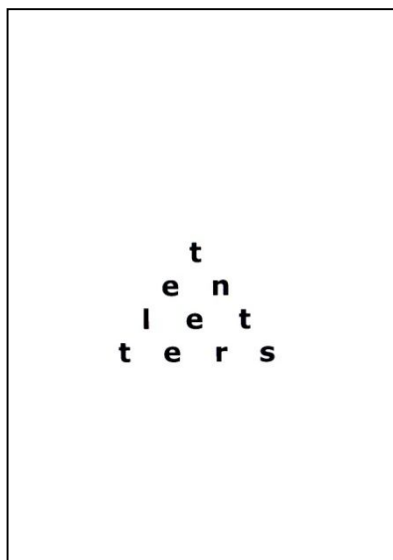
mathematics and literature are similar in certain (often metaphorical) aspects, they build – and belong to – two different systems of signs. Literature, on the contrary, is convergent with mathematics in a major part, or rather, mathematics consists an essential part of its being.

At the beginning of the present discussion I ventured to state that literature is different from mathematics because literature is a creative art while mathematics is not. This does appear sensible: after all, mathematics cannot be overly *creative* since its area of operating and investigation is limited by very strict rules. Contrary to this statement, however, the renowned American mathematician Paul Halmos claims that mathematics “is a creative art because mathematicians create beautiful new concepts; it is a creative art because mathematicians live, act, and think like artists; and it is a creative art because mathematicians regard it so” (Halmos, 1973, p. 180). It would not be very sensible to disagree with a statement pertaining to mathematics made by a renowned mathematician. Moreover, another mathematician adds specificity to this claim, asserting that “[i]n the language of mathematics, equations are like poetry: They state truths with a unique precision, convey volumes of information in rather brief terms, and often are difficult for the uninitiated to comprehend” (Guillen, 1995, p. 2). Thus, there are clearly visible points where mathematics and literature cross. In fact, mathematics may be regarded as a discipline necessitating more imagination and creativity than poetry; a well-known anecdote states that the German mathematician David Hilbert, when told that one of his students gave up mathematics in order to become a poet, said “Good – he did not have enough imagination to become a mathematician” (Hoffman, 1998, p. 95). In the subsequent section, I will show that literature – as an extraordinarily *precise* type of literature, necessitating creative imagination and discipline – is founded on mathematics viewed in such a way.

Mathematics and Ten Letters

Fajfer’s *Ten Letters* (Pol. *Dwadzieścia jeden liter*, literally: *twenty-one letters*, translated by Katarzyna Bazarnik, 2010) is a collection of poems contained in the form of a *dos-á-dos* Polish and English book with a compact disk inside, on which we find an additional piece, entitled *Primum Mobile* (animated by Jakub Woynarowski). It is also a book in which rather simple geometry is well-visible, even in the front cover, with a black-and-white structure of a triangular ten-letter word. Quite obviously, there is a trinity of elements visible already in the title: the phrase “ten letters” contains ten elements and those elements are all letters.

Figure 1: Zenon Fajfer, *Ten Letters* (2010)



Form appears to be a key word in any discussion of this innovative piece. This unusual volume of poetry encourages its readers, through its formal structure, to act on it in one way or another. Moreover, *Ten Letters* is an aesthetically pleasing book whose structure is by no means transparent, even though at first sight the volume presents itself like a typical literary work (the only striking characteristic is that it does not have any numbers or barcodes on the covers). It is a book in which *patterns* are noticeable, and it is a literary piece which might be tentatively called "experimental," in the sense that the volume as a whole does not fit in any current standards of literary publishing. An extraordinary pattern can be found in the text itself, the pages, and the volume as a whole. That is why one can claim that it is a book – or a book-like literary object – with a mathematical core, and this is clearly presented as such in the textual layer as well, both in its abstract meaning and in its pattern.

There is also a *pattern* in the form presented on the front cover. The form of the title phrase may be viewed as an equilateral triangle, a perfect though non-existent geometric figure, aspiring to form a figure of speech at the same time. It can be seen as a pyramid, the perfect shape which contains all the elements – paths, corners, and textual inscriptions – that are inside of the volume, in its

“space.” This pyramid-like shape is also an encapsulation of the idea of literature as a genre in which text is the most important element, but contained in a certain form at the same time. As readers, we see the textual architecture on the cover and automatically know, in some sense, what is going to welcome us inside of the volume.

The pattern of library poems often follows what Fajfer has devised (on the basis of anagrammatic poems, in which the initial letters of all lines together form a word or phrase) and identified as emanational poetry, in which “the text is derived from one ‘bottom’ word in such a way that each of its letters ‘issues’ a new word beginning with this letter. The resultant text ‘issues’ another text and the procedure is repeated several times” (Bazarnik, 2007, p. 197). Such a technique shows the unity of a piece of poetry on several layers. This method of writing poetry is to be found throughout Bazarnik and Fajfer’s model library work *Oka-leczenie* (2010) or in Fajfer’s poem [*Ars poetica*] (translated by Bazarnik), published both in *Ten Letters* and on the compact disk *Primum Mobile*; in the latter, the “emanating” of the text is especially well visible.

As regards the form and the possibilities of reading that it presents to the reader, [*Ars poetica*] may be read in three ways: (1) word by word, like a typical poem; (2) by following the initial of each word (“Immortal naked space...”); and (3) vertically – by following the initials in every line (“Inside toward”), just as in anagrammatic poems. Finally, the reader gets to the “original” (or “bottom”) word “It,” formed of the initials of the two words “Inside toward.” This genetic, and somehow Biblical, “It” (a word which literally is “in the beginning” here) is presented as an encapsulation of at least two or three poems that are going to be shown to the reader (in the electronic version) or found by the reader herself (in the “analogue” version) as developing from this “bottom” word. Such an encapsulation may be viewed as a mathematical formula or a play with words and letters, similar to that in anagrams, but one also has to admit that there is a pattern (a frame), similar to a mathematical set of rules, which has restricted the poet and made him, in a sense, more of a craftsman than a poet, if such a differentiation is regarded as justified.

Figure 2: Zenon Fajfer, [*Ars poetica*] (part of *Primum Mobile*)

It's me?	Milky Oceans.	Read.	Trace astral letters.
Nothing.	Agni, kindle ekpyrosis.		Desire's
sweet potion.		A cup?	Empty.
Inside new screens		I'd drink.	Evil
desire?	Reset.	Eat avidly my initials.	Now, go:
either		you,	eye
[Ars poetica]			
there	I.		My eyesight
obscured.	Vast	expanses	reach
where	an intellectual		trap
arranges fate.	Toward Elsinore rocks?	Waves are running down,	
running		up.	New
days	or	wasted	nights.

One has to bear in mind, however, that a very similar restriction is placed on the author creating “typical” poetry as well. Here, limitation appears in the form of numerous grammar rules, possible combinations of words, patterns of fixed phrases and idioms, etc. (this restricting frame of each language is best noticeable in the process of translation). We can assert, however, that out of a set of possible restrictions, the limitation imposed by language is the most flexible one, while the restriction imposed by the form of anagrammatic poetry is much stronger, and the one in emanational literature – as a kind of a synthesis of typical poetry and anagrammatic poetry – is the strongest one, building the *third* level of difficulty. Such a level necessitates more than just a poetic craft, and that is why Fajfer was able to call this work [*Ars poetica*], i.e. “the poetic art.” Indeed, the piece presents an art of *building* a meaningful poem out of components that have their own limitations, and it is an art of devising a poem with additional

restrictions placed on its textual and visual structure by the new, complicated form of emanational poetry.

What we see in Fajfer's poem, then, is the result of a process of attempting to create poetry limited by the letters "i" and "t." Out of their connection, a new "it" appears, and out of this word – a new phrase presents itself in front of our eyes: "immanent treatise." Then it furls again into another "it," which unfurls, in turn, into "it's the," and further into the phrase "it's the she, / the he, embodied," and then a whole new poem appears:

*it's their silent
touch. hearing everyone.
smelling him everywhere.
tasting her everyday.
hidden everything.
eye must be outside dreams, inside embo... died*

(Fajfer, 2010, no page numbers)

Liberature, represented by *Ten Letters*, is a poetry of unity not only thanks to the intricate connections between letters, words, phrases, and whole poems, but also because there are many places in which correspondences are provided with other works of Fajfer, whose pieces are supposed to form a whole. For instance, in *Primum Mobile*, we see the emanational line "DOWN," which then changes into "Detect Ozone Whole Nearby," and this is a clear reference to Fajfer's earlier (bottled) work entitled *But Eyeing Like Ozone Whole [sic!]* (2004).

Liberature is writing concerned with form – as we have already stated – and the form is content (as well as content may be form). This was presented earlier in *But Eyeing...*, where a bottle – a practical everyday object – was changed into an essential part of the library work, not as a container only but also as an object conveying a poetic message. Inside of this object, another poetic message is conveyed by a foil with a printed text, and on the foil there is yet another poetic message, presented as an emanational poem. In *Ten Letters*, Fajfer shows his disrespect for (or slight fear, or rejection of) form in yet another way: he abandons the very phrase "table of contents," and in his work he calls a list of his poems inside of the volume a "system of coordinates." Obviously enough, both names are only references, just as the existence of a table of contents is based on its being only a reference, not much more than a list of indices. It is, moreover, only a representation of the (inner) structure of a written book; a system of coordinates is also a representation, and nothing more, of points in an imaginary

mathematical space. Most of Fajfer's poems appear to be "imaginary" pieces, placed in brackets and proving their own non-existence and unimportance.

It is clearly visible that form is a fundamental component of any library work – and *Ten Letters* is the epitome of this – and that form itself conveys a certain message, one which sometimes can be interpreted in various ways, so the traditional literary division of form and content cannot be used in this context, but both should be analysed and interpreted. The triangular shape of the phrase "ten letters" – and also of Fajfer's first poem in the volume, which also has a triangular pattern – seems to allude to God (we can ask whether it may possibly be an allusion to the Godly position of the author or the editor, or maybe the looking reader himself) and to spirituality in general. There is no eye inside of the triangle, but there is a manifest library unity of at least three elements: (1) the text, (2) the shape of the text, and (3) the shape in which the text is placed, including both its spatial arrangement and geometry *and* the arrangement of pages. That is to say, the phrase "ten letters" is a ten-letter phrase contained in a triangular shape, which may yield associations with the Holy Trinity. I have enumerated two Biblical elements which are to be found in *Ten Letters*, and Łukasz Jeżyk finds the third one: alluding to a Biblical phrase stating that to see is to believe, he claims that to see is to know and to understand, and that it is especially so in the context of this library work, where "technology and its visual aspects introduce the order of the hermeneutics of suspicious overlooking" (Jeżyk, 2010, p. 175). This "suspicious overlooking" is allowed especially by the structure of pages in *Ten Letters*, some of which have to be "overlooked" or even cut open in order for the text inside to become visible.

In my view, liberature situates itself in the domain of literature (as it incontrovertibly does) in a way similar to how geometry or algebra situate themselves in the field of mathematics. Bazarnik, a library author and theorist, indicates that her aim as an artist was never to create an artist's book, which would be placed in a gallery or on exhibition, but to make a *book*: "we wanted it to be read. Our priority in writing and designing it was not to make it visually appealing, but to find an appropriate form that would suit its subject..." (Bazarnik, 2009). Therefore, Wojciech Kalaga calls liberature a trans-genre, "crossing the borders of literary genres and traversing through them..." (Kalaga, 2010, p. 76–77). Just as algebra is a trans-field of mathematics, then, which is used in various other subfields of the discipline, so liberature also is a trans-genre, connected to various other genres. After our initial analyses, however, we might as well speak of a new trans-field genre of "liberatics," or library mathematics.

Liberature draws our attention to various aspects of a literary work that are normally either done according to a tradition (of printing, for instance, or of using a certain set of fonts) or utterly ignored. Acting in such a way is based on defamiliarization, a well-known concept devised by the Russian Formalist Victor Shklovsky in 1917, and neatly synthesized ten years ago by a Russian professor of literature: "Defamiliarization of that which is or has become familiar or taken for granted, hence automatically perceived, is the basic function of all devices. And with defamiliarization come both the slowing down and the increased difficulty (impeding) of the process of reading and comprehending and an awareness of the artistic procedures (devices) causing them" (Margolin, 2005). This theoretical assumption is reflected in Fajfer's poem entitled [*Ars numerandi*], which bashfully proposes a new attitude to mathematics:

*(Maybe
there should be a new start to everything
from nought)*

(for example, multiplying by nought)

*(if you thought more deeply about it
 $7 \cdot 0 \neq 0 \cdot 7$)*

*seven
multiplied by nought
still remains seven
and nought
even multiplied by seven
doesn't cease to be
nought)*

(Fajfer, 2010, no page numbers)

Indeed, we can use the term defamiliarization here, as a literary concept employed for a discussion of mathematics. It is not pure (i.e. non-applied, or theoretical) mathematics though – since pure mathematics does not deal with such problems – but it is a phenomenon which we might call a "poetical mathematics." In pure mathematics – which Halmos (1973) calls *mathology* – multiplying is alternating, obviously, but if one analyses the equation from a critical perspective, it really is not the same when inverted. Even though the result of multiplying seven by nought is zero, the "seven" itself is not erased, but the effect of multiplying seven by zero is a new zero, only genetically connected

with the former. It appears that the poem expresses an idea which may be formulated in words like “in fact, nothing is something,” and not only in the sense of the possibility to make something *ex nihilo*, but also the other way around, nothing from something. The text of Fajfer’s poem does not “wish” to be visible, it is hiding between brackets, and yet the message it conveys is as silly and timid (*vide*: “maybe” and brackets) as it is subversive, at least to our perception, very often based on learned mathematical axioms. Liberature, in other words, is a mathematically-oriented art of defamiliarization.

Liberature is also an art of playing with, and defamiliarizing, language, especially in its textual aspect. In the poem [*Ars lectoria*], the shape of the words is essential, though apparently impossible to render in English: “chwila ; która / mogłaby trwać wiecz / nie wstawaj” [literally: “a moment ; which / could last forever / don’t stand up”]. What draws our attention here as an important visual and mathematical element is the word “nie.” It has a double function in the poem – as a negation (*don’t*) and as part of the word “wiecznie” (*forever*). It is a component joining two parts of the poem, a common denominator which glues together the whole of this poem in its textual and visual aspect. It is also an essential element of a textual game, which every library work offers its reader. A part of this game is pure mathematics, and another part is an implied mathematical basis of liberature.

Summary and conclusion

To sum up, we may claim that Fajfer’s library volume *Ten Letters* is mathematical in various dimensions, and the position and workings of mathematics in the discourse of liberature has been presented on several levels. We have noticed especially the importance of form for the message that is conveyed by such a piece; moreover, we have discussed patterns noticeable on various levels (the text in its form and the message it conveys, the pages, and the volume of poetry as a whole). As it has been stated, there are various ways of reading this work, and it appears that none of them prevails; one of the “keys” to this poetry is the mathematical frame. In the formal aspect, we have noticed multiple restrictions which are placed on the author of liberature, and especially on the author of emanational poetry. Besides, it has been indicated that defamiliarization is one of the elements which, inextricably combined with mathematics, build the basis of the library discourse.

Zenon Fajfer’s library piece *Ten Letters* has been analysed as a work in which mathematics plays an important role. Mathematical qualities have been indicated on various layers and levels of the piece: the physical, the textual, the visual, as well as all of them combined. The game of numbers has been found not only

where it is obviously visible and essential to understand the message of the work, but also in places in which such a game might not have been intended; in this respect, especially number three has been proven to have an elevated position in *Ten Letters* as a significant example of a library work. There is much more mathematics in Fajfer's library piece than it seems at first sight; mathematics here is abstract and logical, and more complex than it appears in the shapes and numbers presented to the reader on the cover.

Since mathematics in *Ten Letters* is also filtered through language, the work is close to what Halmos regards as "real" mathematics when he indicates that "[m]athematics is abstract thought, mathematics is pure logic, mathematics is creative art. All these statements are wrong, but they are all a little right, and they are all nearer the mark than 'mathematics is numbers' or 'mathematics is geometric shapes'" (Halmos, 1973, p. 177). In a similar manner, literature has been analysed as literature but at the same time, it has been shown *not* to be literature, and to be mathematical at the core in this respect. In fact, mathematics and poetry are interrelated and a human being needs both of them, since, as Michael Guillen diagnoses, "just as conventional poetry helps us to see deep *within* ourselves, mathematical poetry helps us to see far *beyond* ourselves – if not all the way up to heaven, then at least out to the brink of the visible universe" (Guillen, 1995, p. 2). That is why we need poetry, and that is why we all need literature: to see and to understand ourselves and the surrounding world.

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Thank you, Justyna, for all your love and neverending patience.

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