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Truth Written in Verse:

Transmediations of Scientific Discourse in Swedish Eco-poetry

Abstract: The article discusses transmediation of truth claims and truthfulness in eco-poetry and takes as example the poetry collection *Permafrostens avtagande* (*The Declining of the Permafrost*, 2007) by Swedish poet Åsa Maria Kraft. The aim of the article is twofold: First, to study how transmediation of scientific source material (which in this context includes all kinds of media that represent a scientific content in a formal matter: newspaper articles, scientific reports, documentaries etc.) affects the perceived and real truthfulness of a poem. Second, to discuss what eco-poetry gains – both aesthetically and in its perceived truthfulness and urgency – by transmediating content and/or form from scientific source media.

Truth claims are not identical with truthfulness. *Subjective* truth claims in literature have to do with conveying a sense of sincerity and authenticity: we believe that the represented thoughts and emotions have actually been experienced. As I have stated elsewhere (Tornborg 2020), I regard *objective* truth claims in literature as being either something that we “by means of experience and habit” ascribe to the text or “claims made in the text, in various ways, implicit or explicit, of being truthful about external conditions” (9). A media product can transmediate a specific type of scientific jargon without transmediating a scientific content, and thus create what Gunn Enli (2015) calls “authenticity illusions” (1), but not real truthfulness. Thus, a text can fool us, and since no text can guarantee its own truthfulness, I believe that the only way to prove it is to include external references that in turn can be validated. This line of thought should be put in relation to the Heideggerian way of regarding poetic truth: as a kind of secular revelation (Roger Scruton 2015, 149). In this tradition of thinking, poetic truth is something different compared to what we usually mean by the word. Instead it denotes a deeper understanding of the essence of things.

Transmediations of representations of scientific knowledge affect poetry both aesthetically and in terms of truthfulness. The article uses intermedial theory to disentangle the media relations in play in Kraft’s book, as well as to shed light over the issue of real truthfulness in poetry, with the purpose of better understanding the eco-poetic usage of science.

Keywords: intermediality, transmediation, eco-poetry, truthfulness, truth claims.

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1. Introduction

In her article “‘Ichtyologue’: Freshwater Biology in the Poetry of Ted Hughes”, Yvonne Reddick (2015) asks if perhaps not enough attention has been given the relationship between science and ecopoetry:¹

Contemporary ecocriticism has examined the cultural values inherent in science, interrogated its limitations, and posited how other forms of discourse can interact with it, but perhaps not enough attention has yet been paid to the often key role that science and scientific discourse play in inspiring ecopoetry. (264)

The interrelations between ecopoetry and the natural sciences are multifaceted and range from mere inspiration to complex transmediations. Examining these different types of relationships can help us to better understand the many ways that different media successfully can convey ecological issues. In the present article I have chosen to examine the intermedial aspects of the connections between science and poetry, thus combining ecocritical and intermedial methods. More concretely, this means that I regard the presence of scientific characteristics in poetry as a form of transmediation, from various scientific source media – which I define as factual sources mediating a natural scientific content in a formal manner, including scientific reports, articles and journals, non-fiction books, documentaries, news programs, newspaper articles, etc. – to a target medium: a poem.

Ecopoetry, with its roots in the Romantic era and its preoccupation with nature poetry, has in our present time become increasingly focused on ecological crises. The perspective is often post humanist and ecocentric, informed, among other things, by the Anthropocenic discourse. It is no wonder that the thematic turn from traditional nature poetry’s escapist dreams of an untouched nature (which of course did not lack insights into the impact that man has on the planet) to an acute awareness of an imminent ecological disaster, deeply must affect both theme, motive and form of modern ecopoetry. The activist approach that we can see in ecopoetry from the seventies and forward is rooted in the insights emanated from the environmental movement that began in the 1960s and 1970s. Here Rachel Carson’s *Silent Spring* from 1962 plays an utterly important role in spreading awareness about the consequences of using pesticides such as DDT. Ecopoetry can be propagandistic in different ways, for example by explicitly asking the reader to act in one way or the other. Another approach for poets to call for action is to include scientific facts in their works in an effort to convince the readers that the threat is real, and that change is necessary. Propagandistic features in poetry are not unproblematic from an aesthetical point of view, since poetry, in the view of most critics since the Modernist era (see for example the French Symbolists and the German Expressionists), is supposed to be ambiguous, symbolic and multivalent. There are periods in modern history where poetry has taken on overtly political features,

for example Swedish poetry from the Sixties and Seventies. A lot of poetry from that time comes across as obsolete today and furthermore, is held in quite low regard among critics. However, a poem can be politically motivated, and it can contain scientific facts, without being considered propagandist. Reddick (2015) states that

[t]he question of whether or not scientific data should be included in ecopoetry remains problematic. In the opinion of the present critic, if scientific data can be deployed in a way that adds to the aesthetic value of the poem without sounding propagandist, it can enhance the quality of the writing in a startling and unsettling way. (265)

Thus, if scientific data can enhance the multivalency of the poem instead of reducing it, including such data can result in a win-win situation: the poem becomes aesthetically interesting as well as potentially informative about factual matters.

Poetry can relate to and communicate with natural science in many different manners and on many levels, for example in the themes and motives of the poem. The relation to natural science can also affect the poem's form, structure, and stylistics, which we will see in the analyses. This article explores the merger from an intermedial perspective and discusses how it influences our understanding and interpretation primarily of the poem, but to some extent of the scientific source material as well. A key concept is *truth claims* and the article investigates whether or not truth claims can be transferred from the source medium, for example a scientific report, to the target medium, a poem, thus making it scientifically trustworthy, that is, truthful in an objective, positivistic sense.² If that is the case, is it correct to assert that texts can prove their own truthfulness by means of transmediation? Another question is how this transfer affects themes and motives as well as the form of the poem. What does ecopoetry gain – both aesthetically and in its perceived truthfulness and urgency – by transmediating content and/or form from scientific source media?

The article begins with an explication of the poetic and the natural scientific/factual discourses respectively, and why it is relevant to examine their interrelations. Thereafter I discuss truth claims, the difference between subjective and objective truth claims, and how a text's genre, form, structure and stylistics can function as truth claims. This is followed by examinations on how different kinds of transmediations of content and form from scientific source media result in different types of truthfulness in poetry. The article's last section contains a longer analysis of a poem and a poetry collection by Swedish poet Åsa Maria Kraft.

2. Transmediation from Scientific Media to Poetry

One way of regarding the manifestation of natural science in poetry is as the result of a transmediation from scientific source media to the poetic target medium. Transmediation is a term that denotes a process of transfer of content, meaning, structure or other characteristics, from one medium or media product – for example a novel – to another – for example a dance (Lars Elleström 2014). This transfer is often thought of as taking place between qualified media. According to Elleström (2014), there are two qualifying aspects of media:

The first of these two qualifying aspects is the origin, delimitation and use of media in specific historical, cultural and social circumstances. This may be called the *contextual qualifying aspect*. Modal combinations and blends can be performed in very many ways and often there is no manner of automatically deciding, on the basis of the modal properties, where the limits of a medium are to be found. That can be determined only by way of investigating historically determined practices, discourses and conventions. (---) The second of the two qualifying aspects that define media includes aesthetic and communicative characteristics. This may be called the *operational qualifying aspect*. There is a strong tendency towards treating a medium as *a* medium, or an art form as *one* form of art, only when certain qualitative aspects can be identified. Such aspects are, of course, not eternally inscribed but formed by conventions. (24f.)

Qualified media are composed of different basic media – media that according to Elleström (2014) are “defined by their modal properties” (5) and not by their historical and cultural contexts. For example, the basic medium of novels and poems is visual text, and film consists of the basic media sound and moving images. However, media products can be based on the same modality modes and still belong to different qualified media. Elleström (2014) exemplifies by using two different media; academic article and poetry (89). Normally, they both consist of printed, verbal text on paper, but they are qualified in different ways: historically, contextually, operationally etc. Therefore, transfers between a scientific article and poetry can be termed transmediations even though they do not consist of different basic media.

Despite their different qualified properties, poetic and scientific media are not absolute, unchangeable categories, totally detached from each other. The natural sciences and how they were mediated to the public and the scientific community two hundred years ago were very different from the natural sciences and their mediations today, and much of the poetry written today would not have been recognized as poetry two hundred years ago. All kinds of media borrow traits from each other and are influenced by one another. As I have previously

noted (Tornborg 2019), poets belonging to the avant-gardist, modernistic tradition, for example the Objectivists, the Concretists and to a certain degree the Imagists, experimented both with poetic form and content. They introduced new themes and motives that were not previously associated with poetry, and thus changed the view on what poetry could be. Their contemporary avant-gardist successors continue this tradition, constantly challenging media borders.

This raises the question: If the boundaries already are blurred and no category is stable, is it meaningful to even discuss a merger? The answer lies in the qualifying aspects of the two media types: Despite the constant mixing of media, we still associate, and have always associated, scientific media and poetry with different properties historically, contextually and aesthetically, even though the properties have changed. One of the most important differences for this discussion is the kinds of truth claims we ascribe to each media type. This has to do with both the contextual and the operational qualifying aspects. Historically we can see that science and poetry mostly have been treated as opposites, where science has been given the role of providing us with objective knowledge about the outer world. Natural scientific propositions are based on empirical observations that can be verified or falsified. Poetry on the other hand, has been associated with the representation of subjective experiences of the inner world at least since the eighteenth century. Even when a poem has scientific or documentary themes and motives – traditionally non-poetic topics – they are given symbolic values and are taken as meaning, in fact, something else:

[i]n literary criticism, for example, the classic argument against a historical method in criticism has been that facts in poetry are not like facts in history: a fact is a fact in history (whether we mean by the term "history" the historical event or the historical text), but in poetry facts transcend any one-to-one correspondence relation. In poetry facts are taken to be multivalent, or as we sometimes like to say, symbolic. They are open to many readings and meanings, and any effort to explicate them by a historical method, it is believed, threatens to trivialize the poetic event into a unitary condition. (Jerome J. McGann (2002, 223)

McGann describes the traditional attitude towards poetry, an attitude that can be found for example in Paul Ricoeur's (1985) description of the scientific and poetic discourse. Ricoeur asserts that the aim of scientific discourse is to eliminate the ambivalence of language while the poetic discourse strives to uphold it. This is traditionally and historically how scientific and poetic communication have been understood, and often how they actually have functioned.

In conclusion, poetic and (natural) scientific discourses are qualified in very different ways and scholars and laymen readers alike perceive that they are incompatible quantities, meaning that they are essentially different in both form and content. Even though there are rarely

any essential properties when it comes to media, the two discourses, or communications, are in practice quite different both regarding form, purpose, content and context. However, mixed together they have the potential of successfully addressing ecological issues in a manner that meet both aesthetic and scientific demands.

3. Truth Claims

Francis Phil Carspecken (1996) distinguishes between subjective and objective truth claims³: “Subjective truth claims are claims about existing subjective states (I/you are feeling such and such; I/you think such and such; I/you are being honest, etc.). (---) Objective truth claims are claims that certain objects and events exist (or existed) such that any observer present could notice them” (20). Thus, objective truth claims are claims to objective truthfulness, whereas subjective truth claims are claims to subjective truthfulness. Georgia Christinidis (2013) connects subjective truth claims to authenticity: “the choice to sincerely represent one’s subjective reaction to outside events can be termed ‘authentic’” (35). In her view, authenticity in literature designates “the fictional representation of subjective responses to external events” (35).

The difference in truth claims has a lot to do with genre and context, as Gunn Enli (2015) explains: “Mediated authenticity is crafted via a consistent use of genre features and conventions for mediated communication. Trustworthiness of mediated content is often evaluated on the basis of previous experiences with the media” (136f.). Previous experience allows us to associate certain kinds of media with certain kinds of relations to the truth. News media, for example, have traditionally been treated as objectively trustworthy: “The news media are expected to serve audiences as citizens; to inform and enlighten them” (Enli 2015, 4). A scientific article has even stronger claims to truthfulness in comparison with news programs on television and radio or in newspapers. This has to do, among other things, with the conventions of the medium of scientific journals, where all assertions made in the text must be supported by references to earlier, already validated research. If the assertions are based on tests and experiments, these must have a high repeatability. However, as we will see, scientific articles are not always trustworthy on an objective level. Honest mistakes can be made, such as typing errors or errors in the conducted research, but articles can also be fraudulent. Even when we know this to be the case, we presume a scientific article to be trustworthy when we read it. This is not the case with poetry. As Dennis Rasmussen (1974) argues:

Perhaps the safest generalization that can be made concerning prepositional truth in poetry is that poetry may use prepositional truth as material, but it appears that we cannot expect that poetry will always offer, or even try to offer, true

propositions. A poem may contain any combination of true and false propositions, depending on the poet's artistic purpose. (15)

On the other hand, poetry is normally understood as being authentic in Christinidis' (2013) sense, although, as she points out, "the 'authenticity' of literary texts is necessarily a construct" (36). Barbara Herrnstein Smith (1971) shares this view:

The statements in a poem may, of course, resemble quite closely statements that the poet might have truly and truthfully uttered as an historical creature in the historical world. Nevertheless, insofar as they are offered and recognized as statements in a poem, they are fictive. (271)

The fact that poetic statements are fictive, since they are uttered in a context of fiction, does not, however, mean that they are dishonest. For T.S. Eliot and other critics in his tradition, sincerity is necessary for the poem to be successful. Roger Scruton (2015) explains this view:

[p]oetry succeeds when it is sincere, true to the sentiments that it claims and which command our respect; it fails when it lays claim to sentiments that it fails to encompass, because its words are false, banal, or empty. For example it may be composed of expressions which are borrowed, assumed as a matter of convention, riddled with clichés, so as to claim a grandeur or seriousness which it does not attain. The distinction between the true and the false in poetry is, on this view, the distinction between true and false sentiment, between real emotion and 'faking it'. (157)

Martin Heidegger also saw some kind of truthfulness as a prerequisite of successful poetry. Great art in general, and great poetry in particular, reveals a more original and intuitive type of truth compared to scientific facts: "For Heidegger poetic description is truth whereas the scientific description actually moves away from this truth" (Rachel Coventry 2017, n.p.). Scruton (2015) describes Heidegger's view on poetic truth as a kind of revelation: "He is writing about a *revelation*, in which things come before the conscious mind in a way that shows what is otherwise hidden" (149).

Both these positions – poetry as true on a deeper level and poetry as authentic and sincere – can be connected to subjective truth claims, which in turn – obviously – are connected to subjective truthfulness. A poem that treats existential subjects such as life and death, love etc. can be regarded as truthful, both in the Heideggerian understanding and in terms of sincerity. A poem with an "I" – a poetic persona – that conveys subjective thoughts and observations about feelings or existential matters, can be perceived as authentic without making explicit truth claims. Furthermore, if readers are encouraged (for example by the publishing house or by literary critics) to make a biographical connection between the

poetic persona and the poet, there is a strong possibility that they will perceive the poem as authentic. This is more often the case with texts written by female or immigrant authors, which implies that the claims in these cases are enforced by a prejudiced audience, which is encouraged to do so for marketing reasons rather than made by the authors, and that the claims are based not on earlier experience with similar texts but on a biased view of these authors and their texts.⁴

3.1 Transmediation of Form and Illusions of Truthfulness

It has been said that “no written text can guarantee its own truthfulness” (see for example George Aichele, 2007, 308). If you think about it, it makes sense. We can choose to believe that a text with explicit truth claims is truthful, but we only have its own word for it. And texts can lie. Having truth claims is not the same thing as being truthful, and the structure and stylistics of a text can make us interpret it as objectively truthful when it isn't. For example, we might be more inclined to take statements in a formally written text as facts compared to statements made in a text that appears to be subjective, sentimental or surrealistic, simply because we are used to encounter facts in formal texts. In her discussion of “mediated authenticity” Enli (2015) describes how visual media such as television use photoshop, lightning and similar tools to create what she calls “authenticity illusions” (1), and this concept can be used in our context as well. An illuminating example is one of the fake scientific articles written by Peter Boghossian, professor of philosophy and mathematician James Lindsay, published in respectable journals. Their objective, inspired by the Sokal hoax, was to expose what they saw as the ideological bias of gender studies, and the article, “The Conceptual Penis as a Social Construct” (2017), was published in *Cogent Social Sciences* after a blind peer review. According to the authors themselves, the content was completely nonsensical: “After completing the paper, we read it carefully to ensure it didn't say anything meaningful, and as neither one of us could determine what it is actually about, we deemed it a success” (Boghossian and Lindsay, 2020, n.p.). The authors claim that one reason why it was published is that it fit ideologically into the field they criticized, but also because it “looked the part”. Had it not been structured like a scientific article both formally and stylistically, their hoax would never have succeeded. According to Mike McRae (2018), “[t]he research was a complete sham, and the paper's wording reflected the convoluted, dense language they associated with the field” (n.p.). In one paragraph, Judith Butler was cited, but the quote was not complete and furthermore merged with the word “penis”, which obviously resulted in a completely new and totally nonsensical sentence. In other words, *form*, *vocabulary* and *stylistics* were familiar to the scholars of the field they were mocking, even though the authors exaggerated the usage of academic jargon and mixed the terms and concepts in a way that made the *content* incomprehensible.⁵

I have included this example to show how important stylistics is for our pre-understanding and expectations of a text's truthfulness. A corresponding event took place in Sweden in 1946 when a poetry collection named *Camera obscura* was published under the name Jan Wictor, which was a pseudonym for the two authors Lars Gyllensten and Torgny Greitz. As it turned out, the explicit intention of the authors was to show that anyone could write modern poetry. In other words, they adapted a poetic jargon and literary devices that were popular at the time, just as Boghossian and Lindsay claim that they did in their article. Gyllensten and Greitz thus made subjective truth claims, but they lied: there was no authenticity in the collection, no lived experience, no sincere emotion and no attempts to explore the essence of our existence. Therefore, the poetry collection was not subjectively truthful.

We do not usually expect or demand objective truthfulness in poetry. However, when we come across something that presents itself as a scientific fact in a poem, I hypothesize that we are more inclined to believe that it is objectively true if the stylistics of the poem matches the proposition. By being non-lyrical and unrhymed, and by using technical terms and scientific jargon but little or no imagery, a poem can make objective truth claims.⁶ Still, it is only a claim, and not truth in itself.

4. Transmediation of Content as Subjective Truthfulness

To a certain degree, transmediation of content transforms it and sometimes it can be difficult to identify the source medium or media. In some cases, it might even be difficult to separate a transmediation from mere inspiration. However, I suggest that if a scientific discourse containing actual facts occurs in the poetic target medium, a transmediation has taken place. Even if the closest source medium is another poem, or a novel, or a Sci-fi movie, the primary source medium (the original medium in the transmedial chain), is some kind of scientific medium since that is where these notions first appear. A transmediation is not always, or even most of the time, a simple process where something is transferred from A to B. It might be a transmediation from A to B to C to D, or from A, B and C to D. Media are always involved in transmedial processes in a dynamic, reciprocal and complex network, as for example Regina Schober (2013) and Elleström (2014) convincingly have argued.

A poem can transmediate a scientific fact or phenomenon and represent it poetically just as science fiction represents it in prose. The poem can in these instances function as a translator that adapts scientific concepts and notions that are hard for us to grasp into a language where we understand it on a more intuitive or emotional level, for example by means of metaphors, symbols and other types of visualizations. Daniel P. Donaldson (2001), whose research focuses on geographic education, discusses how poetry can add to the

understanding of a natural phenomenon:

While the empirical elements of the winter season might be reasonably clear, a deeper comprehension of the sensory nature of “winterness” would often be absent. Poetry can add significantly to one’s understanding of winter. How is winter a mosaic of elements in which humans exist rather than simply a season of cold and a collection of meteorological measurements. (25)

What Donaldson is aiming at is the often-mentioned ability of poetry to help us connect to things on a deeper level, to mediate a multitude of impressions in one concentrated image. He is also approaching Heidegger’s view of poetic truth: that real human experience is closer to the truth than scientific measurements. In his article on Percy B. Shelley’s *Queen Mab* and Charlotte Smith’s *Beachy Head*, Philipp Erchinger (2018) points to our inability to understand vast distances in time and space (what could be called a “hyperobject” in Timothy Morton’s (2013) terms) and asks “[h]ow, after all, is one to obtain a conception of starlight travelling to the earth at a speed of ‘5,422,400,000,000 miles’ per year if not by some kind of simulation or fiction (247f.)?” An example of this kind of translation is found in the last stanza of a poem from Jonas Gren’s (2016) poetry collection *Anthropocene: Verse for a New Epoch*: “Thin as the crane chick’s legs/Anthropocene will lie/in the box of sediment/among epochs⁷”. The poem meditates over the significance as well as insignificance of the individual: “I am unique/and I don’t matter”. This points to a post-humanist perspective where the “I” is a temporary construction, unique while it exists but, in the end, as insignificant as the Anthropocene era is (or will be) from a geological point of view (at this point though, the idea that there will be an earth at all after Anthropocene seems almost too optimistic). In the poem, deep time which because of its scale is impossible for us to really grasp, is made understandable by a metaphor, a spatialization of time as a box of sediment, and our epoch, Anthropocene, constitutes a thin layer in this box. The poem transmediates a geological discourse and the discipline’s method of studying sediments to learn about the history of the planet and turns it into a poetic metaphor which is easy to visualize, thus enabling us to comprehend the concept of deep time. This is often how manifestations of science in poetry function. Transmediation, where the scientific source medium is integrated to such a degree with its target medium that it is completely transformed, is not one that clashes with either the Heideggerian position or the demand for sincerity. Even though the propositions in, for example Gren’s poem, are not false from an objective point of view, they are expressed in a deeply subjective manner and transformed accordingly. Therefore, I see them as an example of subjective truthfulness.

5. Transmediation of Form and Content as Objective Truthfulness

Nevertheless, there are instances where the transmediated characteristics are easier to identify, when the poetic form and the scientific form are not integrated in the sense that the poem has features or stylistics borrowed from scientific media, but rather are combined on the page: two forms that coexist in the same text but are distinguishable. Examples of this are quotations from and references to scientific media products or media types in poetry. Quotes and footnotes, as well as other types of references in poetry, can have many purposes: to tell a parallel story, to deconstruct the text by making it polyphonic, to illustrate the multiplicity of contexts and intertexts surrounding a literary work of art or, in a postmodernist manner, play with meta levels. In the present case we are interested in quotes, references and glossaries containing facts about scientific issues. We want to know if the objective truth claims associated with these types of paratexts remain when they appear in poetry. Erchinger (2018) discusses how we can understand the scientific footnotes in Shelley's *Queen Mab*, and one of his conclusions is that the notes create truth claims, as "the note seems to provide a scientific basis for the imagery used in the verse text, making evident, as Robert Mitchell has argued, that the poetic description is true to a mathematical conception of the world, rather than entirely arbitrary or fictitious" (247). Erchinger asserts that footnotes and the like give credibility to the assertions made in the poem, while Ilya Kukulin (2010), in his discussion of Russian documentalist poetry, argues that factual source media are used mainly for aesthetic reasons, an aesthetics *by way of* truthfulness:

[D]ocumentary images, original texts, and testimonies are increasingly being used for the creation of artworks that are not intended to be reports, but instead tell philosophical parables (the films by Godfrey Reggio) or express profoundly lyrical utterances (some of Alexandr Sukorov's films). It is obvious that the basis of documentalism is not only – or not so much – the material but the aesthetic objective: in documentary art, the author assumes the position of the eyewitness, reporter, or public political thinker and orator, justifying his position by referring to "real facts" (the films of Michael Moore). (585)

Kukulin (2010) asserts that by using what he calls "life-like material" in poetry the reader is guided "toward viewing 'authenticity' as an important aesthetic aspect of the work (586). The effect is that the reader is required to "to apprehend documents or factual information in two different registers simultaneously – the aesthetic and the social (or historical-anthropological)" (586), which is applicable in our case if we replace "social" with "natural-scientific". The transmediation from one qualified medium to another forces us to understand both media in a novel way, where the poetic discourse is taken as being more objectively truthful and the scientific discourse is understood aesthetically as well: "the

visions of poetry are supported by science” but “the progress and programs of the various sciences are themselves unified by a vision that only poetry can provide” as Robert Mitchell (2001, 2) asserts in his discussion of Shelley’s *Queen Mab*. Even though there are obvious differences between canonized Romantic poetry and modern Russian poetry, the factual information seems to play similar parts in the given examples. Furthermore, Mitchell’s assertion ties in with the analysis of Jonas Gren’s poem earlier and the discussion of its role as a translator: poetry can enable us to grasp hyperobjects.

Having examined several transmediations of scientific material to poetry, I would say that the transmediation of scientific or factual media characteristics generally has two functions: it affects both how we perceive the poem aesthetically and how we regard its claims to truthfulness. The authenticity, I argue, does not solely have an aesthetic purpose, but also an aspiration to inform readers about real conditions and events. Kukulin (2010) describes three tendencies in the “manifestations of documentalism” he sees in contemporary Russian poetry:

The first includes poems in which the objective to create a particular kind of reportage, a report on a nonfictitious event, is declared either openly or indirectly. Thus the reader’s trust in the author is based squarely on the report’s nonfictitious nature, while the event’s “genuineness” becomes, in some sense, an additional prerequisite for perceiving it aesthetically. The second tendency includes collages made from other people’s texts, which are regarded as the manifestation of another consciousness and as the incursion into the text of another social and psychological reality. The third tendency could be called combined or synthetic - it is based on existential lyrical utterances provoked by documents which are either cited or, paradoxically, “produced” through the signs of their own absence, that is, through indications to the effect that such a document could exist (a kind of “shadow” of the document). (595)

While it could be argued that the above cited poem by Jonas Gren belongs to the third tendency, we will now look at a poem where the latter two tendencies can be identified, Maria Küchen’s (2015) poem about ghost nets:

“There are examples in the literature of ships with a large surplus of nets on board in empty storage spaces. When these storage spaces get filled with catch, some of the unnecessary nets are dumped. A catch of valuable fish compensates for the value of the nets that are thrown overboard” *ghost nets that beyond control keep on catching: net on shipwrecks, nets that have been dumped or lost: they continue to catch year after year*, I see them, creatures flouncing in the gillnets, the voices, I hear them produce power structures as if they still belonged to someone who could force me to anything.⁸

Küchen lists a few sources at the end of the book but does not specify which quote comes from what source. However, all the sources listed at the end are factual (newspaper articles) and/or scientific. The poem is structured as a prose poem but with three formally different parts: The first one is a quote and the second one is in italics which gives it a sense of stream of consciousness, especially since there are no full stops or capital letters. The last can be seen as a sort of more distanced comment to the two earlier parts, a kind of a volta (turn of thought or argument) since the poetic persona is here introduced for the first time. The first part, being transmediated from a factual source medium, has a formal tone and does not express any emotions, even though what is actually said is unsettling. It gives objective credibility to the poem, gives it a clear purpose, and situates the poem in a specific context. On the other hand, the clash between the neutral tone describing something horrible and the poetic context it appears in aestheticizes the quote; it is now part of a poem, an artistic media product, and in this new role it appears even more apocalyptic and fateful. There are many ways to understand and interpret this poem. In this context, and because of the ecopoetic nature of Küchen's poetry collection as a whole, I have limited myself to a strictly ecocritical reading.

In one extreme example of scientific quotation and reference, Swedish poet Åsa Maria Kraft's poem (2007): "The Definition of the Koch Snowflake (the Koch curve)" from *Permafrostens avtagande* [the declining of the permafrost] consists of one lengthy quote and one image from Wikipedia about the Koch curve⁹.

Definition of the Snowflake curve (the Koch Curve)

1. Take a line.
2. Split the line in three equally large parts.
3. Make a copy of the middle part.
4. Put the two copies in angle against each other so that they fit in the same section as a singular line usually does.

Repeat (iterate) from step 2 for all the new lines that have emerged because of the operation.

The number of new lines to operate on will always be 4 times the earlier number of lines, so the number of lines after n iterations will consequently be $4n$. The line increases its length with one third after each new iteration and will therefore finally be an infinitely long curve, although within a limited space. Because of that, the scantling numeral of the curve is not an integer. This is the reason that the Koch curve is a fractal, (from lat; fractus, *fraction*). The Hausdorff dimension of the Koch curve is

$$\ln 4 / \ln 3 \approx 1,261860.$$

(http://sv.wikipedia.org/wiki/Von_Kochs_kurva (n.p))

In this poem, Koch's snowflake, which is a mathematical term that describes a geometrical phenomenon, is represented in two ways. Verbally, by means of the Wikipedia quote with a footnote that tells us where the quote is taken from, and graphically, by means of depicted geometric forms, also taken from the Wikipedia article¹⁰. When reading "Definition of the Snowflake curve (the Koch Curve)", Jorge Luis Borges' short story "Pierre Menard, author of the *Quixote*" first published 1939, comes to mind. Pierre Menard, as we know, does not want to repeat Cervantes' achievement, namely being Cervantes writing *Don Quixote*, he intends to be Pierre Menard writing *Don Quixote*¹¹. The difference, obviously, spells context. The same thing can be said about Kraft's re-writing of the short Wikipedia text. There are of course dissimilarities. For us, one crucial difference is that Kraft has a reference which frames her text as a quotation. However, by letting it constitute the whole poem, the text transcends the quotation to become a transmediation, and thus a transformation, of the original media product. In my further analysis, I will situate the Koch Curve poem in the poetry collection as a whole.

The way the collection is structured both formally and in terms of content, makes it difficult to separate the texts/poems from one another and look at them as separate entities. The poem (or part of the poetry collection, there is no clear demarcation between the texts and they are often untitled) is placed on the fourth page in the book and operates as an introduction to its main theme, namely climate change and the consequences of the melting of the permafrost, for example the release of methane gas which will further affect the climate. In that context, Koch's snowflake, a mathematical formula that in its graphic form is similar to the shape of a snowflake, transcends its function as an abstract fractal and is given concrete properties as well. This is further emphasized by the other factual texts, which describe the properties of real snowflakes. The snowflake functions in this context both as an index of a /c/older climate, and as a symbol for climate change.

Kraft's poetry collection is partly structured as a script for a surrealistic play, complete with stage directions, in which Richard Nixon plays Dick Cheney and Arja Saijonmaa (a Finnish singer) plays Condoleezza Rice. There is also a character named Metan, "a creature that was born from the methane gas that is released from the northern mires where the permafrost is declining" (played by Jan von Eyck's painting of his wife, Margareta van Eyck), and a choir playing the role of the Pit/the Controlled, "a system of secret, underground prisons/their content". The two final parts are Wilson A. Bentley, American meteorologist and the first photographer who captured snowflakes on camera (he plays himself) and "a silent, but visible, voice from a screen grown out of Metan's belly" (which gives associations to such diverging media products as children's television program *Teletubbies* and the film *Videodrome*). The cast is presented on the first spread, on the right page (the left page depicts Koch's snowflake, as does the whole cover of the book). The first lines on the page

read as follows:

The The-atre
proudly presents
THE DECLINING OF THE PERMAFROST
or THE SNOWFLAKE CURVE
a musicicle¹²

The actors appear on stage both in character and as themselves. Even when they are cast in the same scene, most of the time they do not interact or really communicate with each other, instead they seem to be prisoners in their own minds, mumbling nonsense or singing to themselves. References to warfare and political events are mixed with lines from popular songs and endless repetitions of words or parts of words. Many of the characters exist or have existed in real life which grounds the collection in reality, but a twisted and distorted reality where Arja Sajjonmaa in her role as Condoleezza Rice sings her own most famous song and Dick Cheney's character mumbles tirades about the military anti-terrorist operations "Vigilant Guardian" and "Able Danger" (connected to 9/11) and at the same time plays videogames.

Metan enters some scenes, almost like a fate, declaring that this has to be done, that she needs to change. The choir sings about the frozen ground turning to mud. In other scenes, William A. Bentley describes his encounters with snowflakes, and the collection also contains reproductions of Bentley's photographic depictions of snowflakes. The book ends with a list of references, but the Koch Curve poem is the only one with a citation. The scenes alternate with short texts that in a factual manner describe different properties of snowflakes, for example:

1 Plates

If the air is dry, the crystal will not be able to grow bigger, instead it will keep the basics, the shape of a six-sided prism. They form at temperatures between -10 and -20 degrees Celsius. (7)

These short texts are then manipulated into longer texts with repetitions and inversions of words and sentences, as well as new semantic elements. Versions of the text quoted above, for example, appear on pages 9, 11, 13, 15, 17, 19, 21, 23, 25, 27 and 29. Thus, the book itself can be described as Koch's snowflake: constant iterations that render the form more and more complex¹³.

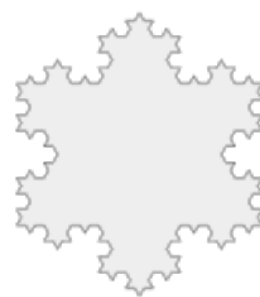
Due to the citation, the Koch Curve poem itself is understood to be truthful: we do not doubt that the Koch Curve exists and that it is described correctly. However, in line with Kukulin's (2010) assertions, we also read the description from an aesthetic point of view: what role does this transmediation play aesthetically? As Jørgen Bruhn (2013) has suggested, transmediations must be understood as dialogical processes in which the source medium



First iteration



Second iteration



Third iteration

and the target medium both affect each other, and where they both become transformed due to the transmediation. After having read Kraft, Koch's curve suddenly appears poetical, almost mystical, and that association is activated every time I encounter the Koch curve in other contexts.

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Returning to the poetry collection with these new associations in mind, the aesthetical properties of the poem are highlighted both in terms of form and content. It functions, as stated above, as an introduction to the main theme, and it can also be regarded as a description not only of the fractal but of the architecture of the collection as well. However, in the light of the rest of the collection, I believe that it also says something about the spatiotemporalities of the Anthropocene. In the description of the Koch curve we read that "[t]he line increases its length with one third after each new iteration and will therefore finally be an infinitely long curve, although within a limited space". We live within the boundaries of our earth-space, but time is unlimited; earth can fill an almost infinite amount of time. This vertiginous perspective is reflected in the theater script, where names such as Rice, Cheney and Nixon seem oddly dated already, while others, such as van Eyck and Bentley, seem more unaffected by the passing of time (the status of Arja Saijonmaa is somewhat unclear at this time). Metan symbolizes deep time, sprung from the methane gas released from the ancient permafrost.

The stylistics of the poetry collection varies between sections. The formal descriptions of snowflakes are, I would say, instinctively interpreted as truthful (they turn out to be quotes from a chemistry teachers' experiment manual). However, when they expand and become more and more nonsensical, inverted and fragmented, they adopt poetic properties, and invite the reader to focus on the materiality of written text:

On the screen on Metan's belly:

if the air is dry the crystal will if the air is dry the crystal will not the crystal not the
crystal not be able to grow bigger instead it will keep the basics the shape of the
shape of the shape of a a a six-sided sided sided prism (11)

Just as snowflakes melt, the text dissolves before our eyes. This is just one of many examples of textual iconicity in the collection which, as previously mentioned, also contains reproductions of Bentley's photographs. The multimodality and the mixing of genres reflect the fragmentation and polyphony of the collection. The constant references, both verbal and graphical, to the natural sciences (there are also references at the end of the book) form the basis and permeate the collection.

However, can we trust what we read when so much of the content has become distorted? And if not, what is the function of these scientific references? I still believe that they, to a certain degree, serve the same purpose as in the other examples – to establish a link to reality, to say truthful things about ecological issues. In that regard, the references have a didactic function. However, the disintegration of the text points at the same time to the fact that what we hold as long-established truths, are changing. The text dissolves just as the ancient permafrost, leaving us exposed, confused and afraid.

6. Conclusion

In this article, I have shown how different kinds of transmediations (transmediations that result in different degrees of transformation) affect truth claims and truthfulness in ecopoetry. Subjective truth claims are related to subjective truthfulness and can be found in ecopoetry – and other types of poetry as well – that conveys a sense of authenticity and sincerity about the sentiments and experiences it expresses. Objective truth claims are related to objective truthfulness and prevail in poetry that contains quotes and references from scientific and other factual sources which can be verified. Ecopoetry gains from being perceived as truthful – it has something important to tell us that we had better believe, and transmediations from scientific sources is one way of convincing us of its urgency. I have also discussed how form and stylistics can function as a truth claim: I hypothesize that we are more inclined to believe that something is a fact if it is presented in a factual manner.

Therefore, poetry that borrows form and stylistics from scientific and factual media are more likely to be perceived as objectively truthful. Poetry can also engage with scientific facts and form in an avant-gardist, experimental manner. This does not necessarily reduce the truth claims embedded in scientific facts, data and discourses. By making them part of the poetic discourse, they must change, adapt or in other words: transform. They are transferred from one context to another, and they affect and become affected, by the transfer.

I have also discussed the notion that poetry can serve as a translator that enables the reader to understand scientific concepts and hyperobjects such as deep time and vast distances, first and foremost by means of metaphors. I believe that poetry has that potential, but, unlike Mitchell, I do not claim that poetry is the only medium with that capacity. All kinds of aesthetic media have the potential to explain the world and the human condition, and to give us new perspectives on difficult issues.

End Notes

1. Ecopoetry can be defined as poetry that in various ways processes ecological issues as well as the relations between humans and the non-human world.
2. Obviously, scientists can be wrong, but science has, in most cases, the intention of being truthful, which is why we ascribe objective truth claims to scientific media. Furthermore, science can be validated and falsified: sources and references can be checked, and experiments can be repeated.
3. As I have stated elsewhere (Tornborg 2020), I regard truth claims in literature as being either something that we “by means of experience and habit” ascribe to the text or “claims made in the text, in various ways, implicit or explicit, of being truthful about external conditions” (9).
4. The problem with this type of reading is that it is based mostly on presumed intention and often disregards other interpretations based on the poetics and aesthetics of the author. However, authenticity is more than the understanding of the text as a “confession” (which is how female poets often are read), since a poem can be authentic without solely expressing the sentiments of the poet.
5. Or did it? Having read excerpts from the article, I’m thinking that maybe it makes more sense than the authors themselves understand, the reason being that they, in fact, do not belong to the field they criticize. With that being said, many, many statements in the article are preposterous and it should not have been published. However interesting, this discussion is way beyond the scope of the present article.
6. A poem might make use of scientific discourse and jargon for aesthetic, ironic or formally experimental reasons, which would contradict what is said above. However, I believe that such objectives would be quite easy to spot. Furthermore, a poem can be both formally experimental and actually tell facts, which we will see further on.
7. Translated by Jonas Gren and Dougald Hine.
8. The poem is translated by Maria Küchen and me.

9. The quote from Wikipedia is originally in Swedish, here I have used the English version.
10. I am aware that Wikipedia is not academically regarded as a scientific source, however, it is very easy to control the truth-value of its articles, especially if they have, as in this case, respectable references. General and established knowledge is usually represented correctly in Wikipedia.
11. Related to the discussion above about jargon and stylistics, it can be noted that the narrator of Borges' short story has a very formal tone which resembles that of a literary scholar, with lengthy quotations from the discussed author and a complete list of his body of work. However, as soon as one starts to read them it is obvious that it is fiction.
12. I have translated the excerpts from Swedish to English.
13. In that regard, Kraft's book resembles, and is perhaps inspired by, Danish poet Inger Christensen's poetry collection *Alfabet* (1981), which is structured according to the Fibonacci Sequence, meaning that "[e]ach number in the sequence is the sum of the two numbers that precede it" (<https://www.livescience.com/37470-fibonacci-sequence.html>).

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