DISSERTATIONES
SEMIOTICAE
UNIVERSITATIS
TARTUENSIS
25

KADRI TÜÜR

Semiotics of Nature Representations: On the Example of Nature Writing

DISSERTATIONES SEMIOTICAE UNIVERSITATIS TARTUENSIS

25

DISSERTATIONES SEMIOTICAE UNIVERSITATIS TARTUENSIS
25

KADRI TÜÜR

Semiotics of Nature Representations: On the Example of Nature Writing

UNIVERSITY OF TARTU
Press

Department of Semiotics, Institute of Philosophy and Semiotics, University of Tartu, Estonia

The council of the Institute of Philosophy and Semiotics of University of Tartu has on May 8, 2017 accepted this dissertation for defence for the Degree of Doctor of Philosophy (in Semiotics and Culture Studies).

Supervisors: Kalevi Kull, Professor of Biosemiotics, University of Tartu
Ulrike Plath, Professor of German History and Culture in the Baltic Region, Tallinn University
Peeter Torop, Professor of Semiotics of Culture, University of Tartu

Opponents: Kate Rigby, Professor of Environmental Humanities, Bath Spa University, UK
Julia Tofantšuk, Associate Professor of British Literature, Tallinn University, Estonia

The thesis will be defended at the University of Tartu, Estonia, on July 6, 2017, at 14.15 in the Senate Hall of the University of Tartu, Ülikooli 18.

This research was supported by the Centre of Excellence in Cultural Theory (RFLAJTKK, European Regional Development Fund), Centre of Excellence in Estonian Studies (TK145, European Regional Development Fund), the Graduate School of Culture Studies and Fine Arts (European Social Fund), Stiftungsprofessur Geschichte und Kultur der Deutschen in der baltischen Region (supported by BKM, IKGN), DoRa Plus programme, and the following research funding projects: Meaning-generation and transdisciplinary methodology of semiotic analysis of culture (SF0182748s06), Semiotic modelling of self-description mechanisms: Theory and applications (IUT2-44), Animals in changing environments: Cultural mediation and semiotic analysis (EMP151), Dynamical zoosemiotics and animal representations (ETF7790), Theory of mimicry and ecosemiotic approach to imitation (ETF6670), Estonian Literature in the Paradigm of Comparative Literary Research (IUT20-1), The topology and texture of Estonian literature. [Intersemiotic analysis] (SF0032471s03), The Two Bodies of Estonian Literature 1956–1968: Ideologies, Institutions, and Core Texts in Soviet and Exile Contexts (ETF9160).

ISSN 1406-6033
ISBN 978-9949-77-461-6 (print)
ISBN 978-9949-77-462-3 (pdf)

University of Tartu Press
www.tyk.ee

TABLE OF CONTENTS

PUBLICATIONS INCLUDED IN DISSERTATION

I Tüür, Kadri 2016. Semiotics of textual animal representations. In: Timo Maran, Morten Tønnessen, Silver Rattasepp (eds.), *Animal Umwelten in a Changing World: Zoosemiotic Perspectives*. Tartu Semiotics Library, 18. Tartu: University of Tartu Press, 222−239.

II Maran, Timo; Tüür, Kadri 2017. From birds and trees to texts: An ecosemiotic look at Estonian nature writing. In: John Parham, Louise Westling (eds.), *A Global History of Literature and the Environment*. Cambridge: Cambridge University Press, 286−300.

III Tüür, Kadri 2009. Bird sounds in nature writing: Human perspective on animal communication. *Sign Systems Studies* 37(3/4), 226–255. DOI: http://dx.doi.org/10.12697/SSS.2009.37.3–4.11

IV Tüür, Kadri 2014. Like a fish out of water: Literary representations of fish. In: Kadri Tüür, Morten Tønnessen (eds.), *The Semiotics of Animal Representations*. Nature, Culture and Literature, 10. Amsterdam, New York: Rodopi, 263–288.

V Tüür, Kadri, Stern, Karl 2015. Atlantic herring in Estonia: In the transverse waves of international economy and national ideology. *Journal of Baltic Studies* 46(3), 393–408. DOI: dx.doi.org/10.1080/01629778.2015.1073928

VI Tüür, Kadri, Reitalu, Triin 2012. Botanical nature writing: An ecocritical analysis. *Estonian Journal of Ecology* 61(1), 9–19. DOI: 10.3176/eco.2012.1.03

The contribution of the author in jointly written papers:

Paper II: I was involved in planning the paper, data collection, data analysis and manuscript preparation. The part “Case Study: In the Western Estonian Archipelago” of the article is solely my contribution.

Paper V: I had the main responsibility for planning the paper and for the manuscript preparation. Data collection and data analysis were carried out individually for economic history (K.S.) and for cultural history (K.T.). The synthesis of the research was prepared jointly.

Paper VI: I had the main responsibility for planning the paper and for the manuscript preparation. Data collection and data analysis were carried out individually for botanical data (T.R.) and for literary analysis (K.T.). The synthesis of the research was prepared jointly.

FOREWORD

"We get to choose our own path far less frequently than we'd like to believe," Estonian writer Karl Ristikivi has remarked. Choosing to write a semiotic study of Estonian nature writing as my PhD project definitely was my own decision, and perhaps not the most informed one. In the context of ecocritical literary studies, nature writing has somewhat lost its novelty as a research material by now. In the context of semiotic studies, nature writing is not the primary material to be included in various models that reveal us the dynamics of cultural processes. In general, there are relatively few people who read nature writing on a regular basis in our digital age.

I believe that studying nature writing can provide us with a better understanding of ourselves as a species, and of our role in the natural processes that constantly evolve around us, be they initiated by humans or other environmental agents. The strive to understand one's place in the world is universal, yet the array of possible answers is immense and hardly graspable. By narrowing the search for the answer to this big question to nature writing and its semiotic analysis, we are able to obtain but one possible insight. At the same time, it definitely leaves out many other interesting options that are to be discussed in the future.

The fruits of the fourteen years' study, work, thinking and writing, presented in the form of six peer-reviewed articles and book chapters, together with a synthesis (that proved to be the most difficult part to take shape) are finally here for the readers to enjoy and judge.

It has been a pleasure to discuss my work with a considerable number of different people during that time. I wish to thank my supervisors Ulrike Plath, Kalevi Kull and Peeter Torop and my colleagues from the department of semiotics who have shown interest in my work, especially the members of the zoosemiotics research group led by Timo Maran, and Jamie Kruis for language editing of the thesis.

Triin, Riin, Kristiina, Ene-Reet, Elle-Mari, Helle-Viivi – I am proud to be able to call such smart women my friends.

I'd like to thank my husband Hannes for being there, and our children Lauri and Roosi, who have formed the most devoted fan club of the present thesis. I have greatly enjoyed our research-related discussions over the Sunday morning pancakes with my mother-in-law Hiie.

I would like to thank my father Paul for teaching me how to defend my argument and my mother Õie for teaching me how to never give up.

I hope the people mentioned here, but also many others, enjoy reading the dissertation and the pieces of nature writing that it is based on – as well as the ones that have remained out of the scope of the present study. And, perhaps most importantly – do not miss the chance to move on, through the texts, to the great outdoors and to our fellow species represented in nature writing!

INTRODUCTION

The present thesis combines ecocritical and semiotic approaches in the study of nature writing, in order to explore what the possibilities are and what qualitatively new perspectives semiotics can bring to the ecocritical study of nature writing.

The two general research questions that I have striven to find answers for in my study are

1) how to conceptualise the mutual relationships between texts and environment in the case of nature writing, using semiotic metalanguage;
2) in what ways does semiotic research of nature writing help to better understand the role of humans and human cultural communication in ecological processes.

The main hypotheses based on the six publications included in the dissertation are the following:

- Nature writing reveals where our Umwelten overlap with those of other species;
- The perception of natural environments informs the ways the texts about them are composed;
- Nature writing and nature-text can be explained in terms of modelling systems;
- Nature writing can be regarded as semiotic mediation between Umwelten;
- Literature informs the ways in which readers perceive the environment and other species;
- The study of nature writing benefits from a transdisciplinary approach.

The reseach embarks from the understanding that nature writing is a remarkable source of material for academic research when we want to learn about the relationships of humans with the rest of the world. Different theoretical models, drawn from biosemiotics, cultural semiotics, and ecocriticism; as well as combining literary theory with biology and history, help to realise the heuristic potential of nature writing. As a phenomenon that stands at the borderlands of a number of human disciplinary activities, nature writing provides a great platform for a transdisciplinary approach. The applied potential of the semiotic study of nature representations lies in the possibility for us, humans, to learn about and of our ideas related to the rest of the nature, and in the possibility to adjust our behaviour accordingly, towards less harm.

The following introductory text integrates and contextualises the six research articles included in the present dissertation. The material presented in the articles comes from a number of sources and in the analysis, different methodological approaches have been applied. In order to synthesise the ideas presented in the individual articles into a meaningful whole, a relatively wide scope was

necessary in the introduction. It is expected that besides semioticians, the potential readership of the present study might include literary scholars, especially ecocritics, but also environmental historians, biologists, animal studies scholars and other participants in the emerging field of environmental humanities. Thence, the introduction aims at defining the core premises of the work in a manner that would be generally understandable, regardless of the disciplinary background of a reader. I hope that this choice will win new supporters of the semiotic endeavour, as well as facilitate cross-disciplinary cooperation in the future.

The introduction consists of three divisions devoted, respectively, to the material, i.e. nature writing; to the central concept, i.e. representation; and to the overall method, i.e. semiotics, that form the backbone of all six included publications. What is said in three words in the title requires thirty times as many pages to be thoroughly explained. Introductory text provides a backdrop for the articles, clarifying the role of each of them in the present work as a whole, and bringing to the fore the common themes that have informed their writing.

The first chapter, "Material: nature writing" is an elaboration of the themes that were initially discussed in my MA thesis: nature writing as a specific type of literature that has merited the scholarly interest of ecocritics, especially the Anglo-American researchers; its historical development and specific traits; devising the dynamic model of the field of nature writing, defined in a narrow sense: as prose non-fiction of the author's firsthand experience in nature, written with biological precision and with literary style. A brief overview is given of the tradition of nature writing in Estonian language, with references to its roots in the respective Baltic German tradition, and to influences from neighbouring cultures.

The second chapter, "Central concept: representation" ponders the notion of representation, and the relation of representation to model, especially from a semiotic standpoint. Representation is a word that is often used, but seldom defined in literary studies. In order to find a feasible explanation for the term that would cover the instances of nature representation discussed in the included articles, a historical excursion is taken into some of the major works on representation and mimesis in the framework of literary theory. Literary representations are always twofold: first, they form an integral part of the text; second, they necessarily connect to the reality as we as humans perceive it. Both of these relations need to be explored in order to understand what are the working principles of literary representation. Representation is then compared with the notion of model as understood in the Tartu-Moscow school of semiotics. According to these ideas, literature can be regarded as a process of modelling, and therefore it is important to explore the relations between model, text, language, and perception from a semiotic viewpoint.

The semiotic understanding of modelling leads us to central topics of the third chapter, "Method: semiotics and beyond". First, the biosemiotic grounds of the study of nature representations are explored, followed by a discussion of eco- and zoosemiotics, as well as of the notion of Umwelt. Umwelt, or the

species-specific repertoire of the perception of and responding to environmental stimuli, is an equally important term for the present study, as is representation. Nature writing is a valuable means of representing the Umwelten of other species by means of an exclusively human sign system – verbal language. The notion of biotranslation is explored in order to find out whether it could be applicable in a semiotic conceptualisation of nature writing. The third chapter finally arrives at the discussion of the questions of disciplinarity, interdisciplinarity, trans-disciplinarity and the possible ways of cross-disciplinary cooperation in the framework of environmental humanities, thus reaching the meta-theoretical level in regard to the included articles: two of them have been born in cross-disciplinary cooperation. It is a pleasant task to reflect on the methodological and practical writing-related choices that my colleagues and I have made in the course of preparing and writing the papers.

The current work in general is a result of continued interest in nature writing and in semiotics that has lasted roughly since the turn of the millennium, and that has previously resulted in the author's MA thesis "Estonian nature writing: Definition and classifications" (Tüür 2003). The research results presented here are by no means exhaustive, but the compilation aspires to be representative of the work done by the author over the past decade or so. There are six publications chosen to be included in the present thesis. Four of them have been published during the past four years (2014–2017); two are from earlier years (2012, 2009). They have not been arranged in a chronological sequence, but in a thematic order. The publications section is opened with two texts, originally written as book chapters, that provide a wider glance at the methodological approach and the historical background of the study of Estonian nature writing. They are followed by four articles that focus on more specific examples of nature representation: an article on bird sounds; two articles on representations of fish, and an article on representations of plants in nature writing. Each of them deals with the question of representation in nature writing and with the possibilities of its semiotic study.

The first publication, "Semiotics of textual animal representations" has been written for the collective monograph "Animal Umwelten in a Changing World: Zoosemiotic Perspectives", composed and issued as a result of the work in the framework of the Norwegian–Estonian research cooperation grant "Animals in changing environments: Cultural mediation and semiotic analysis" that brought together Estonian and Norwegian scholars interested in advancing the semiotic study of animals. This text is closely associated with the second chapter, methodology of zoosemiotics, of the monograph of which it is a part. It strives to provide an example of practical application of this methodology on the basis of an exemplary text from Estonian nature writing, Fred Jüssi's "Sounds". The source text itself (in my translation) is attached to the scholarly analysis as an appendix. Nature writing is regarded as a hybrid object as proposed by Bruno Latour, as challenging the usual cultural binary divisions. Nature-text serves as an explanatory model of this particular hybridity, but also of the context-dependence definitive of nature writing. It is demonstrated how background

knowledge, including tacit knowledge and awareness of purely biological and geographical facts, helps to understand the various meanings of the particular piece of nature writing. In the second part of the text, Umwelt analysis is applied in order to demonstrate the instances of overlapping in human and bird Umwelten that eventually help to achieve a better understanding of our fellow species. The notion of biotranslation is also briefly discussed. The chapter suggests that regarding nature writing as a communication device facilitates our insights into the Umwelten of other species, in comparison to our own.

The second publication, "From birds and trees to texts: An ecosemiotic look at Estonian nature writing" is also originally a book chapter, contribution to "A Global History of Literature and the Environment", written together with Timo Maran. As the book title suggests, the chapter is but one small piece in a puzzle that attempts to embrace the whole history of world literature from an ecocritical angle. The text starts with a brief historical overview of the impulses that have guided the formation of the tradition of nature writing in Estonian language. The theoretical and methodological platform for the subsequent analysis of some examples of Estonian nature writing is ecosemiotics. One of the important insights stemming from an ecosemiotic approach is the understanding that all texts are locally situated; we could even claim that through reception, they form a part of the local ecosystem. The usefulness of Umwelt anslysis is also emphasised. The source material that provides textual samples for the ecosemiotic analysis comes from a) pieces written about our first bird protection area, Vilsandi archipelago, and b) about one of our last genuine woodland wilderness areas, Alutaguse. It is demonstrated that the paths of the authors, their objects of representation, and even the paths of their readers intertwine in the texts as well as in the real landscapes.

After those two more general articles, studies of more narrowly outlined phenomena follow in the form of scholarly articles. The article "Bird sounds in nature writing: Human perspective on animal communication" has been published in the journal "Sign Systems Studies" in 2009, as well as in the collection "Umweltphilosophie und Landschaftsdenken im baltischen Kulturraum. Environmental Philosophy and Landscape Thinking" (Lukas et al 2011). It focuses on the question of rendering bird sounds by (rather limited) means of human verbal expression. The article departs from a zoosemiotic standpoint that it is necessary to compare human and animal communication systems in order to understand the processes that link human semiosis with the rest of nature. Biologists have pointed out that there are structural similarities between the vocal utterances of birds and humans. Bird sounds are considered as signals that carry certain meanings, not merely as a source of asethetic pleasure, as is most commonly perceived in bird songs by human listeners. A semiotic study of bird sounds offers us insights into the natural conditions of the songs and calls, as well as provides an additional dimension in the preception of our environment. Both bird sound and nature writing can be regarded as modelling systems that organise the environmental experience of the respective groups – birds and humans. The notion of nature-text and the definition of

nature writing are discussed; the question of representation is briefly touched upon. Samples of Estonian nature writing are analysed, based on the six sign types as outlined by Sebeok (1994). One of the central pieces under investigation is Fred Jüssi's "Sounds" (see also article I).

The fourth publication, "Like a fish out of water: Literary representations of fish" is included as a chapter in the volume "The Semiotics of Animal Representations". The collection was prepared on the basis of the presentations held at the world's first conference on zoosemiotics, "Zoosemiotics and Animal Representations" in Tartu in 2011. The theoretical standpoint for this article is in zoosemiotics; source material comes from Estonian nature writing. The question of representation is explicitly in the foreground in this article. Based on fish biology and guided by the research questions outlined in Sebeok (1990) and elaborated in Maran (2007a), overlappings of human and fish Umwelten are traced in order to be able to judge to what degree the human representations of fish are based on inter-species' communication, and to what degree it is just human autocommunication where other species are used as loci of reflection and not as subjects in their own rights. One of the main tools of semiotic analysis applied in the article on fishing narratives is the typology of signs outlined by Sebeok (1994). Similar to the article on bird sounds, it is concluded that humans tend to invest a symbolic layer of meaning in whatever type of interaction with the rest of the nature, regardless of how the other involved species – such as hooked fish, for example – might perceive the same situation. Nature writing helps to bring together and mediate those controversial experiences.

The second article on fish, "Atlantic herring in Estonia: In the transverse waves of international economy and national ideology", written together with a historian Karl Stern and published in the "Journal of Baltic Studies", is somewhat different in its methodological approach. It combines two sets of sources for the same episode in Estonian history, namely an attempt to run the national herring fleet in the northern part of the Atlantic Ocean in the 1930s: a travelogue published in an Estonian daily newspaper, and archival documents that reflect political discussion about foreign trade, customs regulations and non-tariff measures. The rhetoric construction of domestic *versus* foreign is observed, especially in representations of fish as foodstuff. Depending on the political conjuncture, Atlantic herring was assigned an ideologically significant value, positive or negative. The other important topic in regard to nature representations is the rhetoric construction of marine landscapes as heroic wilderness to be conquered by "Estonian vikings": as the travelogue reveals, the actual marine landscape that is experienced through hard physical labour differs considerably from the initial idealised representation. The question of international over-exploitation of oceanic resources is also briefly touched upon. The entanglement of economic, political, biological and rhetorical layers makes the story of Estonian herring fishing an exciting case for trans-disciplinary research. The publication does not exhaust all the interpretation possibilities of the material, and it certainly deserves further study in the future.

The article will be re-published together with other contributions to the same issue of JBS, in a book "Food Culture and Politics in the Baltic States" in 2017.

The sixth article that finishes the publications section, "Botanical nature writing: An ecocritical analysis" is another example of transdisciplinary cooperation, written together with a botanist Triin Reitalu and published in "Estonian Journal of Ecology". It has been written following the strict IMRAD model (see Day, Gastel 2006: 21–22) used in science publications. The article discusses an example of "botanical nature writing", using the dynamic model of nature writing as the basis, according to which the qualities of the book are assessed. The methodological approach combines ecocritical and ecosemiotic elements with some botanical interludes. The chronological timeline table has been prepared in the same manner as done in quantitative research. The article is relatively brief and gives proof of the assumption that it is difficult to present qualitative analysis in a highly formalised structure, but it nevertheless remains a valuable attempt in cross-disciplinary cooperation.

In addition to publications, the dissertation has two appendixes that feature additional bibliographic and book history related information about Estonian nature writing.

Appendix 1 consists of an annotated bibliography of all the books of nature writing that have been used as source material in the publications included in the present dissertation. They are arranged in chronological sequence, similar to the "Chronology of the major works discussed" in "A Global History of Literature and the Environment" (Parham, Westling 2017: xviii–xxvi). In addition to the bibliographic information of each book, its title in English is provided, as well as some biographic information about each author. It was quite shocking to find out the fate of a number of authors of Estonian nature writing during WWII. Love for Estonian nature that united them during peace time did not prevent them from being arrested, persecuted, or even killed on both sides of the frontline. Nature writing has not been perceived as a highly politicised activity in Estonian context, but this dimension certainly is not absent in this tradition.

Appendix 2 presents some documentation, a book list, and the introductory texts of a book exhibition "Framing nature: The story of Estonian nature writing" that was organised in Tartu University Library during the EASLCE biennial conference "Framing Nature" in 2014. The book exhibition was a truly trans-disciplinary project, prepared in close cooperation with a number of library workers, and provided a positive experience of academic research being trans-lated into edutainment.

The appendixes serve as a "lighter" supplement to the main body of the publications, and hopefully help to demonstrate that the research connected with nature writing is not necessarily only heavily theoretical, but that it also has historical and instructive dimensions. Nature writing is a good source of material for various transdisciplinary approaches and activities, and it is by no means an outdated or exhausted body of literature. There are many interesting things one can do with nature writing.

1. MATERIAL: NATURE WRITING

The source material for the present thesis comes from Estonian language nature writing. What exactly counts as nature writing? Are there any features in these texts, beyond the common topic – natural environment – that would enable us to to gather the individual textual sources into a definite whole? What is 'nature writing' and what are the features specifically characteristic of Estonian nature writing? These are the questions that the following chapter tackles. The basis for the ideas presented in the first chapter can be found in the MA thesis "Eesti looduskirjandus. Määratlus ja klassifikatsioonid" (*Estonian nature writing: definition and classifications*) defended in the Department of Semiotics at the University of Tartu by the author of the present work in 2003.

1.1. Delineating nature writing

In the Anglophone tradition, *nature writing* is the most common term employed to designate the set of texts that should be of primary interest to an ecocritic. Parallel to that designation, the same body of literature has been termed *nature essay* (Campbell 1996: 124; Maran 2010: 80), *environmental literature* (Mazel 1996: 137; Howarth 1996: 71), *environmental prose* (Buell 1995: 26), or *environmental non-fiction* (Buell 1995: 397–423). What is common to most of the aforementioned alternative cases is that the adjective 'nature' is replaced with 'environmental'. Such a choice suggests that 'environment' may be considered a more suitable designation for this kind of literature than 'nature'. It is true that 'nature' is a word that has a burden of meanings, and that it is tempting to understand 'nature' in a romanticising way – either as a pastoral realm or as a wild elemental force that only heroes are able to master (see Garrard 2004, esp. chapters 3 and 4). 'Environment' sounds more like a technical term that is familiar to us from natural sciences – it is observable, measurable, calculable, and graspable by means of rational thought. For the usage in the present thesis, I have decided to prefer *nature writing*. Although shortness does not necessarily mean clarity, it is a term that is widely used and familiar to many readers. Also, when we look at the Estonian textual corpus of nature writing, this designation suits best, as the thematic focus of these texts are on the natural beauty of and the positive impulses from the places near the writer's home rather than on global environmental processes that may also bring along negative consequenes and emotions. Environment as a problem occurs only seldom in those texts. The reasons for such a tendency are discussed below.

1.1.1. Roots of nature writing

American ecocriticism has, from its beginnings, been concerned with delineating their national tradition of nature writing (see Finch, Elder 2002). In Europe, such attempts have been less intensive: national literatures with their canons had formed here far before anyone took interest in environmental prose as a separate tradition. In the U.S., nature writing was most naturally the central body of literature that the new, activism-prone ecocritical approach was applied to (see Armbruster, Wallace 2001). Besides practical demands of applied literary studies, ideological and national identity related issues definitely also played a part in the American interest in establishing the canon of nature writing (see Glotfelty, Fromm 1996). The first scholar to introduce American ecocriticism in Estonia was Tiiu Speek (1996: 2373–2380). In European ecocriticism, a tendency towards theory development has prevailed (see Goodbody, Rigby 2011). Again, historical, ideological, and identity-related reasons may well have guided the process. But theory development is not complete without a body of literature upon which we could test our theoretical constructions.

The following discussion of the specific traits of nature writing relies on my research previously published in Estonian: the corpus of nature writing in Estonian was delineated in my MA thesis (Tüür 2003) and a definition of nature writing was proposed in an article (Tüür 2007). Two overviews of the history of Estonian nature writing have been published together with Timo Maran (Maran, Tüür 2001; Tüür, Maran 2005). A brief overview of the history of Estonian nature writing is provided also in article II of the present thesis, together with the discussion of its several outstanding examples. Article VI features the dynamic model of nature writing in a condensed manner. In order to limit my source material, the term "Estonian nature writing" used subsequently refers here to non-fiction prose about nature originally written in Estonian language. Due to historical reasons, texts that would deserve ecocritical attention have been written about Estonian nature in other languages as well, such as German (see Plath 2011a), Russian (see Fridolin 2015), Swedish (see Beyer 2004) and others. Those remain beyond the scope of the present thesis, but in the future, an integrated approach that would not limit itself to nation- or language-based criteria is needed indeed. Geocritical theory (see Westphal 2011) is promising in that regard.

Estonian literary scholar Liina Lukas writes: "A researcher of Estonian literature always faces the historical multi-linguality of the local cultural space that necessitates questions, such as what is the context where the Estonian-language literary culture emerged? Why did it emerge, or could it have remained unborn?" (Lukas 2008: 24; my translation – K.T.). The beginnings of the Estonian-language nature writing are in the school textbooks and calendar supplements of the early 19th century. Both included reading material about significant places in nature of the homeland and abroad. One of the most influential early Estonian school textbooks, "Kooli lugemise raamat" (*Reading-book for schools*; first edition 1867; in the subsequent 40 years, 15 reprints were

issued) by Carl Robert Jakobson included high-quality pieces about domestic animals, exotic animals, and places of interest that have been praised as "reaching the level of belletrist writing" (Jansen, Põldmäe 1968: 55). One of the earliest books on natural history for general Estonian-language audience has been considered "Pühhapäwa Wahhe-luggemissed" (*Sunday readings*, 1818) by an Estonian–Baltic German pastor and estophile Otto Wilhelm Masing (Eilart 1976: 20). At the same time, a major gardening book by Samuel von Holst had been translated from German into Estonian and Latvian already in 1796 (Plath 2009: 97) that contained not only pragmatic instructions, but also philosophical considerations of plants, gardening and nature in general. It was intended for a special group of people, manor gardeners, but it is significant that the translation and the resulting cultural transmission were considered necessary. The beginnings of Estonian nature writing are closely related to the Baltic German tradition of natural history and local history studies, enlightenment-induced outdoor education and the need to educate younger generations in knowledge and love of the homeland (Heimat) (Plath 2008: 120–121). For the sake of establishing graspable limits to the sources of the present thesis, Estonian nature writing is considered here as non-fiction prose written originally in Estonian, about the nature and animal encounters in the territory of present-day Estonia.

Why is it necessary to distinguish nature writing from other forms of literary oeuvre? In a very wide sense, we could even say all writing is nature writing, because it is always based on human experiences of our perceived reality. Even if it is defamiliarised in literary creation, we are still able to recognise these shifts on the basis of our own environmental experiences. Also, the resources necessary for writing always come from nature, whether we recognise it or not.

American ecocritics (Scheese 1996; Murphy 1995) have spoken of nature writing as a genre, but this is perhaps true only until we understand 'genre' as a conglomeration of the readers' expectations, just as Paul Cobley has explained it in his article about genres in contemporary media (Cobley 2001: 479–502). If we think of genre in structuralist terms, as a conventional way of structuring one's text and employing certain literary tropes (see Corti 1978), the variety within nature writing appears to be wider than a rigid definition would permit. For example, in their introduction to the "Norton Book of Nature Writing" the editors discuss the problem of discriminating between nature writing and fiction. They admit that sometimes the border is vague (Elder, Finch 2002: 19). On the other hand, 'nature writing' serves as a heuristic device that helps to find and focus on the most exemplary texts that have the greatest potential to yield interesting results in the process of ecocritical and semiotic textual analysis.

Recent developments in ecocriticism seem to suggest that efforts in delineating nature writing have lost their actuality. A number ot theorists and researchers of the 21st century have emphasised the need to move on to a wider array of literary texts instead of limiting one's interest merely to nature writing. In their introduction to the article collection "Beyond Nature Writing:

Expanding the Boundaries of Ecocriticism", editors Kathleen R. Wallace and Karla Armbruster write,

> While a concentration on this form of writing makes perfect sense as a starting point for a critical school that takes the natural environment and human relations to that environment as its special focus, we believe that one of ecocriticism's most important tasks at this time is expanding its boundaries beyond these topics to address a wider spectrum of texts. (Wallace, Armbruster 2001: 2).

Ecocriticism's Grand Old Man Lawrence Buell reminds us in his book "Writing for an Endangered World" (Buell 2001: 8) that the term 'nature' we encounter in 'nature writing' should not be understood just as wilderness, but rather as a phenomenon that embraces all different types of possible environments. Interpreting 'nature' in a wide sense would considerably increase the amount of texts that are of interest for ecocritics. Buell criticises the practice of narrowing one's ecocritical endeavour to 'open-air' genres such as nature writing, pastoral poetry, or wilderness romance, neglecting at the same time other types of texts, such as naturalist fiction, environmentalist feature stories, or the poetics of the urban flâneur.

In ecocritical sources, the term nature writing is used as if it were a clearly designated set of texts, and the possible deviations from the canon easily detectable. It is true that the Anglophone canon of nature writing is well established by now.[1] It is developed further and it is one of the indisputable objects of ecocritical studies. Recently, a designation of 'new nature writing' has been taken into use (see Moran 2014: 49–63) where the writers discover nature in their immediate surroundings, in suburban environments, near big roads, in tiny floristic details, and so on. New nature writing conforms to Buell's indication that 'nature' is not only present in wilderness, but that it can be found in all types of environments. Although Michael P. Cohen (2004: 15) has expressed a concern that "Anthologizing continues to be a major project that shapes the questions ecocritics ask," since then there have been several efforts to define the field of nature writing not just based on the topics addressed, but on the basis of some formal qualities of the texts. As the major anthologising work of nature writing has been carried out in Northern America, this is the tradition that comes naturally as the first choice to be compared to the Estonian one in order to understand where the common roots and origins of nature writing as such could be. In chapter 3, a brief excursion into the connections of Estonian nature writing with Central European and Russian nature writing is provided, but this is a theme that requires more thorough exploration in the future indeed.

On the example of Thoreau, Buell (1995: 421) points out that heterogeneity is characteristic of nature writing not only when regarding it as a corpus of

[1] In addition to the norm-setting "Norton Book of Nature Writing" (Finch, Elder 2002), there are numerous resources on nature writing available on ASLE (asle.org) web page.

texts, but that several text types may be simultaneously present even within one text by one author, or sometimes even in one sentence. In his discussion of the diversity of text types in American environmental nonfiction in the wake of Thoreau's fame, Buell (1995: 397–423) lists the following options: regional prose (particularly of the south and the west); narrative of community, ramble, Field-and-Stream reportage, literary almanac, local natural history (often in the form of locodescriptive poems), agricultural pastoral, homiletics, travel narratives (including local travels), bioregionalism, picturesque essay (text accompanied by illustrations, such as landscape vistas, aestheticising the environment), and popular science. A text of nature writing is thus like a palimpsest that bears marks of different ways of representing nature, assembled from diverse time periods and diverse textual strategies. When compared to American tradition, Estonian nature writing spans over a smaller period and has a more limited literary tradition, but the general trend is there: it has borrowed textual strategies from different types of texts, from Baltic German predecessors, calendar writings and almanacs to old runic songs and folk wisdom. The heterogenic origins may come from different sources, but the outcome – nature writing – is, in principle, similar, thanks to its very basic premise of focusing on the natural environment.

In comparison to Buell's list, the "estuary map" of nature writing has been proposed in "Nature Writing: The Pastoral Impulse in America" by Donald Scheese (1996: 12). His is just one possible model and far from being universal, but it gives a good overview of the main tributaries that have shaped the Occidental canon of nature writing. Scheese identifies the roots of nature writing in Ancient Greek pastoralism and in natural history (both Greek and Linnaean). The latter is later accompanied by Darwinist thought and ecology, but also by travel writing (including narratives of exploration that followed the Columbian colonisation). Two input sources in the scheme that are specifically American are transcendentalism and radical environmentalism. It should be kept in mind that originally the "fore-genres" of nature writing did not necessarily focus on representing nature as their primary goal, but are constructed as such only in the hindsight of literary history. Russian literary theorist Juri Tynjanov discusses the dynamics of literary genres in his study "Literary Fact" (see Tõnjanov 2014: 199–219), pointing out that as some genres establish themselves and become automatised, other, marginal forms of literature appear as innovative and dynamic, set against this background. Which literary genres are "critically supervised" and which are allowed to develop on their own differs in time. Nature writing in Estonia, as well as worldwide, has for a long time had the chance to exist on the margins of literary production without much critical attention. As ecocritics started delineating the canon of nature writing and seeking the common traits of such texts, the field has gradually been organised, classified, and evaluated. In retrospect, a number of texts have been included in the designation 'nature writing' that were intended as something else during their time of writing. Before we proceed to the specific origins of Estonian nature writing, we must make clear what the general distinctive traits of nature writing as such are.

1.1.2. Definitive traits of nature writing

In addition to the "anthologising" project mentioned by Cohen (2004: 15), several ecocritics have made efforts to list the essential traits of a piece of nature writing. On the basis of the survey of these attempts, it is possible to outline the essential qualities of a piece of nature writing, and subsequently, to develop a dynamic model of nature writing.

Introducing ecocritical approach, John Elder describes nature writing as "a rich [American] tradition of reflective nonfiction, grounded in appreciation of the natural world yet also open to the creation's spiritual significance" (Elder 2001: 312). At the same time, he reminds his reader that nature writing is not as comprehensive a genre as its name might suggest, and he also remarks that the designation 'environmental literature' would be more embracing. Let us have a closer look at the three important components of nature writing that Elder mentions: nonfiction, natural world, and spiritual significance. The first two are related to the circumstances of the creation of the text: nonfiction presupposes that the author has been personally present in the natural environment s/he describes, and that s/he relies on biologically correct factual knowledge about the workings of nature. These criteria put the burden on the author's knowledge and observation skills. "Spiritual significance" refers to the idea of wilderness, to its Puritan roots and to its transcendentalist interpretations in American literature. This criterion relates to the innermost beliefs of the author about the origins of the natural world and the ethical principles in relating to it. Thence, the first conclusion about the specific features of nature writing can be drawn from here: the author of nature writing, together with her or his personal experience, knowledge, and attitudes is an inseparable part of the text that s/he writes about her/his nature experiences. In addition to the text itself, in the analysis of nature writing we should therefore take into account the dimension of the author as an agent. This is a qualitative difference from the standard approach in studying fiction, where the persona of the extratextual author is not of critical importance.

Fred Jüssi as a nature writer and a public figure is probably one of the best examples to illustrate this claim from the perspective of Estonian nature writing. For whole generations of readers, he is known not only because of his nature observations, but his image as a public figure that always virtually accompanies his texts: his voice, his way of seeing and capturing nature in photographs, and his philosophical (but not necessarily spiritual) attitudes provide an additional layer to the texts of nature writing published under Fred Jüssi's author name.

The spiritual approach is further discussed by Donald Scheese (1996). Relating to his sample texts from the American canon of nature writing, he focuses primarily on the ideological aspects, on pastoralism as a principal stance in American nature writing, and on the sense of admiration towards the wilderness that characterises this tradition. Scheese (1996: 138) points out that the designation 'nature writer' has been in use in American literary criticism already as early as 1902, and that one of the earliest definitions of nature writing dates

back to 1924. Scheese credits the study of the nonfiction natural history essay by Philip Marshall Hicks as the best early study on the topic that still rings true today. There, the necessary components of nature writing are listed as "scientific observation, aesthetic appreciation of nature, the belief in the immanence of the creative principle in nature, and the feeling of compassion for the suffering of the lower orders" (quoted in Scheese 1996: 140). The reference to the "lower orders" may be associated with the Aristotelian idea about literary representation that it is capable of eliciting sympathy in humans even towards the lowest of animals.

The second conclusion is that in addition to the author's presence and firsthand experience, nature writing should also include and express the writer's understanding of how it would be right (or moral) to relate to nature. The requirement historically posed to nature writing for promoting "right" attitudes towards nature has perhaps somewhat impeded the development of theoretical ecocriticism. When the material conveys strong ideological expectations and the critical practice is induced by social activism, such as concern about the current environmental problems, it is difficult to break with the normative mode of literary judgement. Scheese's work is a good example here: it discusses exemplary texts of American nature writing and provides a good historical background to its study, but it does not provide a technical explanation of why namely these works conform to the criteria of good nature writing. They appear to have been chosen for the analysis mainly because of their ideological suitability for the environmentalist agenda.

A scholar of the literature of American West, Thomas J. Lyon lists three main dimensions of the literature of nature: natural history information, personal responses to nature, and philosophical interpretation of nature (Lyon 2001: 20). In comparison to a regular personal essay, a text containing factual information makes for a more formal and more compressed text. Presenting natural history information also has a certain impact on the composition of the text: a new paragraph often begins with introducing a biological fact that is then followed by a commentary from the point of view of the author. This, again, emphasises the importance of the author in nature writing, as was noted above. The second and the third criteria of nature writing proposed by Lyon support that understanding, as personal responses and philosophical interpretation are both intimately connected to the author as a person, a citizen with her or his personal views, opinions, and feelings. In nature writing, the facts of nature are filtered to the reader through the author's bodily presence. The writer's experience and her/his position in regard to the particular environment that s/he describes also play a crucial part in the formation of the particular piece of nature writing, Lyon claims (2001: 24).

Already as early as in 1995, Buell writes about the "enclave canon of nature writing" that he sees as standing apart from the classical American literary canon. He proposes four principal "ingredients" that make up an environmentally oriented work:

1) The nonhuman environment is present not merely as a framing device but as a presence that begins to suggest that human history is implicated in natural history.
2) The human interest is not understood to be the only legitimate interest.
3) Human accountability to the environment is part of the text's ethical orientation.
4) Some sense of the environment as a process rather than as a constant or a given is at least implicit in the text. (Buell 1995: 7–8.)

It must be noted that all of these criteria relate to the contents of nature writing, including the author's position, not to its formal qualities, and thus they cannot be taken as a delineation of a genre. Rather, it is a heuristic list of traits that helps us to understand, the direction into which we should look if our aim is to find nature writing. "By these criteria, few works fail to qualify at least marginally, but few qualify unequivocally and consistently. Most of the clearest cases are so-called nonfictional works," Buell (1995: 8) explains. That quotation reveals one more important criterion, that of nonfictionality that has been discussed above in association with the author's personage and its importance in the composition of a text of nature writing. Buell's comment on his proposed set of criteria also shows that his aim is not to establish a firmly fixed "enclave", but rather to draw attention to the diversity of texts that are available for an environmentally centered analysis outside the "classical" literary canon. The same is true about Estonian literature. There are several brilliant books written in our literary history that have not received the critical attention that they deserve so far. Ecocritical analysis combined with a semiotic approach helps to improve the situation, and to bring valuable literary pieces back to the readers.

To bring just one example of such a book from Estonian nature writing, let us mention "Vilsandi linnuriik" (*Vilsandi Bird Kingdom*, 1932) by Alma Toom, a schoolteacher and bird protection activist from Vilsandi islet. A detailed introduction of the book and of its author is available in Estonian (Tüür 2004b: 22–25; in English, see article II). The book is remarkable because it is the first one in Estonian that clearly meets all the requirements of nature writing as a specific type of literature. Secondly, it is written by a woman author – although women have had little space in the subsequent development of the local tradition. It was issued by one of the main publishing houses of the time, Loodus (Nature), in Tartu,[2] with a foreword by Johannes Käis, one of the leading education theorists of the time, and a promotor of the nature protection movement in Estonia (Eilart 1976: 31–32). At the time of its publication, the book received but one review, by Gustav Vilbaste in his bulletin "Loodusevaateja" (*Nature*

[2] It is interesting to note that in the same year, 1932, Loodus published yet another major work of nature writing by a woman author – an Estonian translation of Selma Lagerlöf's "The Wonderful Adventures of Nils" (in Estonian, "Nils Holgerssoni imelik teekond läbi Rootsi", translated by Adelaide Lemberg).

Observer), and no reflections in literary magazines. Alma Toom has remained virtually unknown as an author, and her book has not been included in Estonian literary histories, although it occupies a prominent place within the "enclave of nature writing".

The book conforms well to the four content-related criteria of nature writing proposed by Buell. It contains stories of the lives of birds and humans who share the same home – a little islet in the Baltic Sea. Without the birds, the book most probably would have remained unwritten, as the reason for public interest in the islet is motivated by bird protection. The interests of birds have been taken strongly into account in the text. The need for nature protection is explained from the perspective of the waterfowl rather than from the perspective of the human native inhabitants; also meaning that the human interest is not understood as the primary or as the only legitimate interest. The sense of environment as a process is evident already in the structure of the book: the events in the islet's communal life are related to the birdlife that alters according to the seasonal change. The seasonal differences are emphasised as they dictate the life and the events in the lives of all the islet habitants, regardless of their species. The book is a great document of the life on Vilsandi islet, embracing the activities of birds, wild animals, and humans. Poetically written, it deserves to be read and remembered nowadays.

One of the most prolific theroeticians of ecocriticism, Patrick Murphy, writes, referring to Bakhtin, that too tight a reglementation of what counts as nature writing may render the genre "dead", capable of growing only by imitation, not innovation. Murphy lists three criteria of canonic nature writing as follows: "one) nonfiction – fact rather than fancy in determining detail; two) the essay – informational rather than artistic style; and three) prose – referential rather than self-reflexive language" (Murphy 1995: 33). Murphy proceeds with the critique addressed to these criteria, pointing out that they stand for valuing science over art, observation over imagination, and human ordering over natural indeterminacy. However, these criteria serve as a good heuristic device if we are to delineate nature writing in its narrow sense.

1.1.3. Dynamic model of nature writing

To summarise the traits that have been pinpointed by American scholars as characteristic of nature writing, the list would include non-fictional narration; essayist style; inclusion of natural history information; great importance of the author's persona and his/her moral convictions; the personal experience of both the author and the reader; anti-anthropocentrism; and a philosophical stance in interpreting the natural world around us.

In general, these traits also characterise the Estonian tradition of nature writing. The three essential qualities of Estonian nature writing can be formulated as following:

1) The text is based on immediate, scientifically apt observation of some particular location, species, or process in nature.
2) The experience is formulated as an essayistic text, created with an artistic ambition; often aesthetic aspects of nature are fore-grounded.
3) The pragmatic aim of nature writing is to evoke interest towards nature in the reader; to encourage establishing immediate connections with nature, therefore containing direct references to the objects outside textual reality (i.e. in the natural world).

These traits are discussed in detail in Estonian in Tüür 2007, and also in article VI included in the present thesis. In the article, the graphic image of the dynamic model of nature writing, based on these criteria, is presented on page 13. The figure demonstrates that nature writing, a marginal set of texts when we look upon it from the point of view of canonised national literature, moves to the centre of the focus if we regard it in the intersection point of fiction, science, and commodity texts (that instruct readers on some practical issues). This means that nature writing combines features from all of these three realms of writing: it takes style, metaphoric usage of language, and persona-centred approach from belletristics; factual exactness and first-hand observation from science writing, and instructions on practical usage of natural places and phenomena from commodity texts.

The shifts from the three larger textual realms result in nature writing, when combined. A shift on the discursive axis moves a piece of scientific writing to nature writing: the language of science strives towards neutrality and objectivity, being subjected to a number of regulations embedded in the scientific discourse. The language of nature writing is more informal and loose, permitting the use of metaphors, subjective reasoning, and the author's subjective voice. These are also traits characteristic of belletristic writing (fiction). What differentiates nature writing from fiction is a shift in the poetics of the text. As the descriptions of places, living beings, and situations are explicitly related to the respective phenomena in our everyday physical reality, the text acquires documentary ambition in addition to the artistic one. Nature writing is created not only as a "good story", but with the intention of pointing to realia in the realm of the physical world, to the phenomena that deserve our attention not only within the limits of the text, but also outside. The intention of directing the reader through the text, to the natural world that has inspired the literary work, is perhaps the most important idea that distinguishes nature writing from fiction. In the case of fiction, we, for example, are not required to think about the place that has been chosen as the setting of a novel, neither are we as readers invited to share the experiences of the characters of fiction in real life. In the case of nature writing, the experiences of the author, the places visited and the species encountered, serve as an invitation for the readers to follow the footsteps of the writer in order to obtain one's own immediate experiences from the same places and situations. In some cases, such invitation may result in over-wearing a place, like it happened in Varessaare bog island (see Tüür 2003: 42; also article

II). The special connection of nature writing to the environment it stems from is further discussed in the following sub-chapter on the organisation of a text of nature writing, in association with the concept of nature-text.

The shift leading to nature writing from the realm of commodity texts is related to the organisation of the text as a whole. Commodity texts are heterogenous by nature, comprising of small bits of diverse information that is necessary for practical purposes, such as getting from one place to another, picking the right mushrooms, or reducing the pollution. The information can be presented as a narrative, as a bulleted list, as a table, a graph, or a series of pictures. Combining textual and graphic elements is common to both commodity texts and nature writing, but nature writing tends to be more integrated, and less oriented towards delivering applied information. As the main function of commodity texts is to inform, they are often compilations and they may have multiple authors, whereas nature writing retains the author's subjective position. Often, even when combining text and illustrations, the latter are made by the same author who wrote the text (see, for example, Jüssi 1966, Kuresoo 2001).

This threefold dynamic can be explained in terms of syntactics, semantics, and pragmatics.[3] Nature writing and scientific writing share the syntactic dimension, as both tend to present information according to certain lines of logic based on natural history classifications. The realm of semantics ties nature writing to fiction: elaborate language, metaphors, style, and composition, not least the language itself, play a crucial role in creating the meaning of the text. The pragmatic axis connects nature writing to commodity texts, as they aim at informing and persuading the readers to take certain actions beyond reading.

In its borderlines, nature writing is a rather heterogenous phenomenon, as Thomas Lyon (2001: 22) has shown. If we model it dynamically, as a series of shifts from the neighbouring greater textual realms, we get more flexibility in defining nature writing, in delineating its canon, and in studying the relevant texts, applying both ecocritical and semiotic approaches. This definition is a matter of degree, not a pre-constructed rigid framework or an "enclave canon". In its core, nature writing has sufficient inner contingency to be perceived in reception as a distinctive set of texts with its special features. The more distant from the core in any of the three directions a piece of nature writing is, the more similarities appear in comparison to the other texts in this particularly bigger textual realm. Whereas these more distant texts may share little traits with the core texts of nature writing, they at the same time contribute to the homogeneity of the "tributary" textual realm. As Juri Lotman (1999: 16) has demonstrated, re-defining a peripheral phenomenon in regard to some alternative parametres, it may appear as a new centre. In the dynamical model of nature writing, this is the case.

[3] This division has been elaborated in the semiotic framework by Charles Morris (see Morris 1971).

1.2. Nature writing in a narrow sense

Nature writing in a narrow sense can be defined as documentary prose that is based on the author's personal, bodily experiences in nature, informed by knowledge of natural history and biology in general. As nature writing can be regarded as a sub-field of belletristics,[4] it also has the requirement that it should be written down in an elaborate style and it most often uses metaphors and literary tropes as a crucial constitutive element of the story. Although scientific writing, too, like all human language-based communication, is prone to using metaphoric and symbolic devices, the extensive use of such means of description are inseparable from nature writing. The ambiguous position of nature writing in regard to mimesis and the question of representation is discussed at length in the second chapter.

Being one of the definitive traits of nature writing, the inner heterogeneity in these texts needs to be further addressed and classified. It can be done in a number of ways. Based on his survey of the historical types of nature writing, Buell outlines three principal ways of organising environmental material into a textual whole:

1) a seasonal chronicle;
2) episodes in an excursion;
3) items in an inventory (Buell 1995: 421).

These options combine textual fragmentation with compositional consistency and help to systematise the diversity of observations that a natural environment may provide. However, these strategies of textual organisation are also useful on a more general level, as they suit well for providing a preliminary description of a text of nature writing from whichever period or geographic location. These traits perhaps come closest to defining nature writing as a genre: using such organisatory principles repeatedly in different texts helps to direct the readers' expectations into one direction, that of appreciating a literary text as nature writing. On one hand, following a standard organisational principle helps both the writer and the reader to grasp the text as a whole, to predict its progress, and to focus on the content rather than the form of writing. At the same time, after a certain amount of texts that repeatedly use any of such standard outlines, an automated routine may occur. Texts following the same layout pattern become too easily predictable and readers may lose interest in them. However, given the diversity and the inner heterogeneity of nature writing, such perspective is less probable than the problem that readers might not be able to recognise a text as a piece of nature writing. Clearly expressed organisational principles help to fix the readers' expectation horizon and facilitate the reception of nature writing.

[4] About the concept of sub-field, *allkirjandus*, see Hennoste 2003: 57–85; in the context of Estonian nature writing the notion is elaborated in Tüür 2003 (18–19; 30).

1.2.1. Estonian nature writing

Examples from Estonian nature writing also conform well to these organisational principles outlined by Buell. As briefly discussed in article III, we can find texts that follow each of these three options. For example, already the title of Tiit Leito's "Aastaring laidudel" (*A year on the islets*, 1984) suggests that it is organised as a yearly cycle of seasons, covering a full year's circle from late autumn until the leaving of the last migratory birds before the sea freezes the next atumn. Haide-Ene Rebassoo's "Botaanilisi kilde 17 Hiiumaa suvest" (*Botanical fragments from 17 summers in Hiiumaa*, 1975) is a seasonal chronicle, too, although she has focused on the seasons of vegetation (mainly spring and summer), and her recurrent seasonal pattern is that of summers, just as is reflected in her book's title. The figure featuring the frequency and duration of Rebassoo's botanical visits is presented in article VI (the author of the figure is Triin Reitalu). In a way, Rebassoo's botanical etudes can also be regarded as a series of excursions, thus fitting well into Buell's above-mentioned second type of textual organisation. The borders of these divisions appear to be flexible when applied in practice.

Many books of nature writing that simultaneously serve as hikers' or travellers' guides are set up as episodes in an excursion, describing each visited site of natural beauty in a geogrpahically logical order. Many early Estonian travel books, such as Villem Ridala's "Ringi mööda kodumaad" (*Around the homeland*, 1921) or Jüri Parijõgi's "Kevad kutsub" (*Spring is calling*, 1929) are organised this way. The greatest pre-war Estonian nature writer Johannes Piiper has structured his "Pilte ja hääli kodumaa loodusest" (*Pictures and sounds from the nature of homeland*, 1935) as episodes in an excursion. His itineraries can be repeated even nowadays, some 90 years after they have been written. In a way, his pieces of nature writing also come closer to the third type, i.e, items in an inventory, as he notes all the species encountered with great care. Again, this supports Buell's claim that the different organisatory principles may occur simultaneously within one and the same text.

Clear examples of the third type, items in an inventory, are books by Kustas Põldmaa, such as "Koduvetel" (*On home waters*, 1973), and by Peeter Ernits, "Kivialused ja teised" (*Those living under the stone and others*, 2005). At the same time, the animal species discussed in Ernits's book are arranged according to seasonal cycle, each appearing in the order of the time of their most interesting – to a human onlooker – period of behaviour. A rather complex inventory principle is carried out in Rein Kuresoo's book "Loodus on lähedal" (*Nature is near*, 2001).[5] The author, who is an ecologist by training, has chosen to introduce the vertebrates and invertebrates that live near his home, arranging

[5] These books have been discussed and contextualised in the history of Estonian nature writing in Tüür, Maran 2005: 237–270; and in the form of a brief English overview in Maran, Tüür 2001: 4–10. The "enclave canon" of Estonian nature writing has been presented in Tüür 2003.

the stories about the individual species into groups that represent ecological communities, such as garden, forest, or meadow.

It can be concluded that the organisatory principles of nature writing proposed by Buell are well present in Estonian nature writing. In practice, two or even three of these principles may have been implemented simultaneously, thus further confirming the idea that clear textual organisation facilitates both writing and reception of texts of nature writing.

On the basis of the Estonian corpus of nature writing, it can be said that there are several other, perhaps less general but locally particularly characteristic traits that help to define it. These traits have previously been discussed in Tüür 2003, Tüür 2007, but also in articles III and VI.

One of the most outstanding definitive features of the texts belonging to the Estonian tradition of nature writing is that they contain remarkable amounts of folklore. The way in which people have traditionally related to animals and nature in general has ecological as well as societal consequences. Virtually all the early authors of Estonian-language nature writing have grown up in peasant families, thus having strong ties to the environment and animals, especially to their small-scale utilitarian side. Many bird sounds have had human imitation songs in Estonian folk tradition (see Mäger 1994, Hiiemäe 2016). Birds were used as indicators of certain agricultural cycles, but they were regarded also as giving omens to humans. The importance of folk knowledge in understanding the biology and ecology of other species should not be underestimated. In the recent years, ethnobiology has been a rising trend of reseach, and Estonian researches have led the way in it (see Sõukand, Kalle 2016). The adjacent fields, such as ethnozoology, ethno-entomology, and the like, are still to be developed. They have a great potential and they could definitely support ecocritical analysis of nature writing in the future.

Another peculiar feature of Estonian nature writing is that biological data, facts and information about the ecology of the particular species discussed is frequently provided. This, too, can be explained largely by the background of the majority of our nature writers who are trained as biologists, and who have often been active field biologists. Therefore, depicted species are referred to by their correct scientific names, and it is not rare to encounter even numerical data about them. Richard Roht's "Jutte loomadest" (*Stories about animals*, 1951). which are rather adventurous, Seton-Thompson-like youth stories about wild animals, contain for example exact information about the size of an otter or the amount of food daily eaten by a badger. The knowledege that is characteristic of scientific literature has often been embedded in nature writing with great care and skill, so that it does not affect the poetic qualities of the texts, but these two modes run smoothly parallel to each other.

More often than not, pieces of Estonian nature writing contain metatextual information regarding the location, itinerary, season, time, and conditions of the observations. This can also be associated with the training in natural sciences of the authors: such information is typical of fieldwork notes, jotted down in the

field notebooks that naturalists carry around. Texts by Johannes Piiper are especially precise in that regard.

Such metatexts emphasise the documentary, reliable nature of the observations that are rendered in nature writing. The same is true about the author and about his reliability as a narrator: the preciseness in locating one's encounters with other species in space and time indicates the non-fictionality of the stories told. The side-effect of this practice is often the autobiographical touch present in much of Estonian nature writing: natural phenomena are regarded as a part of the author's biography and life. Kustas Põldmaa's essay "Meenutades kodujõge ja teisi kalastamispaiku" (*Recollections of our river and other fishing-sites*) sketches the course of his life as related to water bodies where his most memorable fishing trips have taken place (Maran, Tüür 2001: 8).

One more feature related to the personal, autobiographical experiences is the occurrence of different bodily sensations: being soaking wet, cold, and stiff; dampness, humidity, hot weather, physical difficulties, etc. For example, Haide-Ene Rebassoo in her "Botanical fragments" recalls the scratching of the shrubs, the sweetness of the strawberries, the warmth of a big rock in the sunshine. The perception of nature and its subsequent representation do not necessarily have to rely on the visual or auditory senses only. Nature writing demonstrates that olfactory, tactile, and palatable qualities of nature are also very relevant in sharing one's personal experiences. Timo Maran writes: "By transforming the author's personal experience of nature into a wider cultural experience, nature writing as such is a strategy of drawing attention to nature and assigning it certain values." (Maran 2007b: 64; my translation – K.T.).

The utilitarian side of nature, alongside the instructions of how to get to particular places of natural interest and what to do there, gets featured in Estonian nature writing from its very beginnings. The sustenance-related reasons for going to and being in nature have not lost their importance for Estonian people even in the 21st century.[6] This pragmatic aspect is often manifested in the texts of nature writing by different schemas, drawings, illustrations, etc. that serve the ends of communicating to the reader the most convenient and safe ways of using the natural resources – be it for food or for recreation.

Directing the readers to the actual nature through the texts is perhaps the most important function of nature writing that should be discussed as a definitive and distinct feature of such type of texts. Lyon describes the essence of nature writing as follows,

> The defining characteristic of the natural history essay is that whatever method chosen for presentation, the main burden of the writing is to convey pointed instruction in the facts of nature. As we move toward the right on the spectrum [of Lyon's classification of nature writing – K.T.], the role and relative importance of the author loom a bit larger: experience in nature – the feel of

[6] A nice recent article about the Estonian berry-picking traditions is Bardone, Pungas-Kohv 2015: 319-–336.

> being outdoors, the pleasure of looking closely, and the sense of revelation in small things closely attended to – takes an equal, or almost equal, place with the facts themselves. (Lyon 2001: 21.)

This excerpt emphasises the importance of nature writing as a vector into the "real world". That can be regarded as the principal difference between fiction and nature writing: the latter aims at directing the reader's attention back to the environment where the text stems from. Environment is an inseparable part of nature writing and one of its aims is to convince the reader of the need to make a personal contact with the represented phenomena.

In the case of fiction, seeking for and comparing actual places and landscapes to the ones represented in pieces of fiction belongs to the sphere of literary local studies, later theorised in literary geography (Pocock 1988) and most recently in geocriticism (Westphal 2011). In the case of nature writing, the reader is directly invited to move through the text to get aquainted with the source environment and the species that are described in the writing. The text itself is not the end; it is rather a means for directing the reader to the natural environment that has been represented in the text. Therefore, it is very important that the nature, environment, landscapes, plants, animals, as well as the sounds, smells, and sensations that the author has experienced in nature get rendered in an apt manner. The pragmatic aspect of nature writing requires that it somehow serves as a guide to these environments that the author has personally experienced and from which s/he has driven inspiration for writing the pieces s/he offers to the readers. In addition to the pleasure of reading, nature writing strives to offer yet another pleasure – the pleasure of first-hand experience for those readers who care to take the step through the text, into the nature that they have just read about.

The combination of a human species-specific verbal text and the natural environment together with the species who form its ecosystems creates an interesting and intricate nexus that has been termed nature-text (Maran 2007b: 48–72). In the framework of the present study, the concept of nature-text has been employed in an ecosemiotic analysis of nature writing in articles I and VI (see the graphic model of nature-text in article I, page 225). The model points out that an efficient piece of nature writing must rely on the firsthand experiences of the writer, and in turn, the experience and the natural environment itself determine the structure of the text – the itinerary taken, the species encountered, and the seasons depicted. In addition to the interplay of text, environment, and author, the reader's experience is the fourth crucial node in the model: a text of nature writing makes sense to a reader with similar experiences, most importantly, of the same places that have been visited and described by the writer of the text. The combination of personal human experiences of nature that are shared by means of written texts puts a layer of cultural meanings upon natural environment, making it intelligible to us as

humans and assigning cultural values to it. As a proposed development of Maran's model, the notion of praxis[7] could be added to the concept of nature-text: the human / cultural behaviour always induces certain action patterns and habits that transform nature; human actions and nature's agency mutually shape each other. This idea needs further elaboration in the future, but it is necessary to point out the theoretical development perspective here.

1.2.2. Studied texts

For the papers included in the present thesis that study the representations of nature from a semiotic point of view combined with an ecocritical approach, the source material almost entirely comes from 20th century Estonian nature writing. Estonian nature writing proves to be a valuable corpus of literature that hosts a diverse array of topics, localities, approaches, historical understandings and beliefs. It is a rich tradition that provides worthwhile sample material for very different theory tests and thought experiments. And – last, but not least: the texts studied here are written in Estonian. Language diversity is of equal importance to biological diversity. In the Baltic region, the languages and cultures that have been historically living side by side and inhabiting the same loci, include, besides Estonian, also German, Russian, Swedish, Finnish, and others. One possible way to value this literary tradition is to make it accessible to a wider public via publications in English, the contemporary lingua franca of research. In the subsequent articles, nature writing in other languages has been used in comparison to Estonian nature writing, where applicable: in Finnish (by Juhani Aho, Veikko Huovinen), in German (by Xaver Zedtwitz), and briefly also some works in English (by Ernest Hemingway; a poem by Ted Hughes).

The examples studied in depth in the articles forming the main body of the current study are drawn from the set of texts, the "qualification criteria" of which are outlined in the previous section. They are all characterised by the features of being written as documentary prose based on the first-hand experiences of its writers; they all have a certain foundation in biological knowledge, as well as a literary ambition. The requirement of taking a moral stance or forwarding the author's philosophical views, as it has been proposed in the case of American nature writing, is not emphasised as it is not as pronounced in the texts under study here. One of the reasons for this special feature of Estonian nature writing is definitely the political situation that prevailed during most of the 20th century, when censorship – be it Czarist or Soviet – was actively exercised and it was not advisable to express one's personal views in too explicit of a manner. Already the choice that the authors themselves made to work in the field of nature writing can, to a degree, be regarded as a political statement. The authors of nature writing were obviously not

[7] This idea was generated by Scott Slovic in personal communication on May 21, 2016, for which I am cordially grateful.

interested in writing fiction that especially in the 1950s was subjected to very strong ideological normative clauses, and the writers deviating from these normatives in their work were punished, some even sentenced (Annus et al 2000: 345–351). Nature writing formed a marginal and less regulated enclave in the framework of Soviet literature, and even some people with a "politically incorrect" past (such as Juhan Lepasaar, for example, see article II) had a chance to realise their talent as observers and writers in the realm of nature writing.

It is true that nature writing, especially in the Estonian case where the circle of literati is not too numerous, is associated with a limited number of authors who know each other and the hiking trails of each other, even if they do not always explicitly mention their colleagues in their texts. The same is true about the readership. Nature writing in Estonia has traditionally had a compact group of readers who are biologists or nature hikers themselves, and who may be interested in nature writing for pragmatic reasons, like getting ideas for planning the next hike.

In Tiit Hennoste's term, nature writing is sub-literature (Hennoste 2003: 62) inside the "cloud" that forms Estonian literature: it has its authors' circle and its brother-/sisterhood of readers; its tradition has been continuing under the surface of the mainstream fiction for over 150 years, but its visibility has traditionally been low. Science fiction and life writing would be comparable cases of sub-literature; the latter has recently surfaced in the Estonian literary scene, gaining for a while almost a dominating position over prose fiction. Nature writing has never been a dominating paradigm in Estonian literature, but indeed it has had its fans and supporters all along. As Hennoste (2003: 61–62) remarks, some sub-literatures are more prone to be included in the "big", national literary canon, some less, dependng on how well they sound together with the story that literary history attempts to narrate in a particular historical period. Estonian nature writing has not entered the big national canon yet: information about its texts and the authors is not always available through literary reference books, but must be looked up from natural history magazines, agronomic handbooks, and the like.

A list of authors and their texts discussed in the included articles is provided in Appendix 1. It is set up in chronological order, followed by a brief introduction of each respective author and his/her texts that have been studied as outstanding examples of Estonian nature writing, or as their foreign counterparts necessary for contextualising the research. Detailed bibliographical information about each publication is included in the annotated list. Their bibliographical references are not repeated in the list of sources of the present intruduction, unless the books are mentioned elsewhere in the main text.

1.3. Interim conclusions

The source material for the present thesis, books of Estonian nature writing in Estonian, match the principal characteristic of nature writing in a narrow sense, as outlined on the basis of the works of American ecocritics. Many of them share the more specific features of Estonian nature writing, such as containing folkloristic elements, biological information, pragmatic hints, and very personal, bodily expreiences of the writers. The recurrence of such common features demonstrates that nature writing has shared elements in both content and form, and that it is justified to call it a 'tradition'. It has a long history and the texts are in intertextual relations to each other.

What is that we learnt from this brief excursion into the realm of Estonian nature writing, then? First of all, that the tradition of nature writing in Estonian exists and that it is worth studying. The dynamic model of nature writing (see the graphic model in article VI, page 13) helps to locate this group of texts in regard to other general text types. In addition to the common topic – local natural environment – these texts have many common formal traits, regarding the organisation of text and the presentation of the observations, but also, and perhaps even most importantly, regarding the practical, firsthand experience that these texts strive to induce in readers. It is important to proceed beyond nature writing, to the natural environment that has served as a source of inspiration and as a resource for the writer and that should have the same effect for the reader. Nature-text model that embraces both cultural and natural meanings of the natural environment can be used to conceptualise this situation. Nature-text is an inherently ecosemiotic notion and it is suitable to address the phenomenon further with analytical tools provided by semiotic approach.

2. CENTRAL CONCEPT: REPRESENTATION

Nature writing represents nature. Ecocriticism studies representations of nature. But what is a literary representation? How has the notion of representation been understood in classic literary theory? How could it be understood from an eco-semiotic standpoint? What is the difference between representation and model? In the following, a delineation of the notion of 'representation' is given. This is done in order to use representation as an analytical category in the study of nature writing, as well as in the present attempt to cross-pollinate ecocritical theory with semiotic thinking and to move towards a common understanding of the notion in the framework of environmental humanities.

Ecocritics, such as Lawrence Buell (1995) and Timothy Morton (2007), have theorised representation and ecomimesis (respectively) from an ecocritical stance. In the framework of zoosemiotis, considerable efforts have been devoted to the study of animal representations in the University of Tartu over the past decade (ETF7790 grant "Dynamical zoosemiotics and animal representations" in 2009–2013; international conference "Zoosemiotics and Animal Representations" in 2011; academic publication "The Semiotics of Animal Representations", Tüür, Tønnessen 2014, etc.). In the introduction to the book "The Semiotics of Animal Representations", we have explained a zoosemiotic understanding of the notion of representation as follows,

> In semiotic terminology, 'representations' constitute a class of meaning-relations which is paralleled by the classes of 'signification' and 'communication'. The phenomenon of representation is different from communication in that it does not involve mutual sign exchange, and it differs from signification in that it is typically symbolic, i.e. conventional (arbitrary). That said, the way we *represent* reality tends to influence the way we *perceive* reality (we only see what we are looking for), and in this sense representations are no less related to 'hard-core reality' than is signification. In human life, there is no such thing as a neutral or uncultured flow of signification. Thus, what representations we rely on does to a large extent shape our respective human Umwelten. (Tønnessen, Tüür 2014: 11.)

The same is true vice versa: by means of our human cultural tools, such as (symbolic) language, we can only represent what we are able to perceive (or imagine, for that matter, albeit this is usually not the case with documentary prose, such as nature writing). And, also, our repertoire of representations is rooted in the limits and affordances of our human Umwelten. Hence, in a cultural context, representations are construed (as if by a 'sender'); subsequently perceived (as if by a 'receiver'), and interpreted. In some instances, representations are used in communication, be it intra-, or interspecific. In nature writing, nature representatons are predominantly used in human intraspecific cultural communication, but as it is pointed out later in the present chapter and in article III, for example onomatopoetic verbal representations of birds may yield interspecific communication, too.

2.1. Poetics of representation

One specific feature of nature writing is that it contains relatively ample amounts of static nature representations rather than dialogue or dynamic action. This justifies the special attention paid to the problem of representation in the present work. We will first take a brief excursion into the realm of poetics, and have a look at how representation has been understood in the writings of great literary theorists from Aristotle to Eco, but also how ecocritics and semioticians have used the concept, including the discussion of Juri Lotman's ideas concerning the relation between representation and model. In the framework of the present study, a semiotic understanding of representation also necessarily embraces taking into account the Umwelten of other species involved in the representational activities. We can be almost sure that other species do not have access to representations in written verbal form. Still, we can ask, to what degree our representations of other animals – and plants, for that matter – are compatible with their Umwelten, and what effect do they have on their lives and their well-being. Both cultural and biological components play a role in these processes.

It is also necessary to clarify what a reader should not expect from the current chapter. The discussion of representation does not attempt to reach out to the question of literary realism.[8] The textual corpus of the present study is nature writing, that is, essayist non-fiction, as it was defined in the previous chapter. Each piece, indeed, bears marks of the literary preferences of its time of writing, but nature writing as a phenomenon cannot be directly associated with any particular literary method or movement. Neither does my interest lie in listing of the favourite motifs represented in nature writing, but rather in devising a tool for analysing the mechanisms of literary representations. Another research direction that would be very tempting to associate with the discussion of representations, especially from a semiotic point of view, is cognitive science.[9] The present discussion, however, is limited to the study of representations on the basis of human species'-specific verbal abilities, as manifested in texts of

[8] "Fundamentally, in literature, realism is the portrayal of life with fidelity", The Penguin Dictionary of Literary Terms and Literary Theory states (Cuddon 1992: 773). In order to demonstrate the range of possibilities for achieving the fidelity, the dictionary juxtaposes two descriptions of a thrush – one from Collins's Field Guide to Birds of Britain and Europe, and the other from Ted Hughes's poem "Thrushes". With this and a number of subsequent examples it is demonstrated that realistic representations of life are very diverse and can be achieved by different means. Lawrence Buell points out that realism is a "highly stylized ideological or psychohistorical artifact" (Buell 1995: 87), but at the same time literature still provides us with evidence about the ways in which the world works. About the question of realism in semiotics and in philosophy, see Deely 2011: 74–88. Briefly put, the question of realism is a very interesting one indeed, but too wide a topic to be addressed in the framework of the present study of representations in nature writing.

[9] See, for example, http://plato.stanford.edu/entries/mental-representation (accessed 26.04.2016).

nature writing. The relations between perception and representation are briefly touched upon in the next chapter that delves into (bio)semiotics. In the current discussion, we will walk within the limits of textual communication in its literary forms.

2.1.1. Text shaping perception

The question of language shaping our perception of reality is a central one in cultural semiotics, as well as in critical theory, such as in feminist literary studies, but also indeed in ecocriticism. "[i]n fact texts do reflect how a civilization regards its natural heritage," an early ecocritic William Howarth (1996: 77) writes. We use language to communicate with our conspecifics near and far in space and in time. Ecocriticism has contributed remarkably to the discussion of moral implications of nature representations. Less has been said about how these representations are constructed and which linguistic (e.g. making use of onomatopoeia) and poetic (e.g. the dynamics of viewpoint) possibilities are employed in this process. My aim here is to test the tools for the technical study of representation, with the hope that the result would be of use for future ecocritics.

In his critical discussion of fishing stories, an American ecocritic Dana Phillips puts his comparison of two stories from the beginning and the end of the 20th century short: "Representation has supplanted presence" (1996: 206). That statement is deliberately a strong one, aimed at criticising the 'the society of the spectacle' that has taken over even our most intimate contacts with the rest of nature – such as fishing, for instance. Over the past decades, with the growing ubiquity of information technology, the truth value of this statement has only grown: we post selfies taken with big fish, tweet of our fishing trip experiences, share magnificent views of spectacular fishing waters we have never visited.

'Representation' has a somewhat different field of meaning in literary studies and in semiotics. Lawrence Buell argues that talking about the notion of 'representation' makes more sense in the context of non-fiction, such as nature writing, than it does in fiction (Buell 1995: 64). As nature writing is descriptive rather than fictional, understanding the process of representation is especially important in the analysis of such texts. In order to understand representations of nature, we must first understand the nature of representation. Tracking the usage of the notion in literary theory, especially poetics, and in semiotics reveals principal differences and the general core of the idea of what textual representations are, how they work and what is their function. Although 'representation' is a term commonly used in literary theory and in semiotics, it is not always precisely defined. The excursion into the sources of the concept is intended to provide some orientation for the following analysis. Where applicable, examples of different types of representation are drawn, preferably from the same sources

that have been used in individual analyses presented in the articles belonging to the current thesis.

The Anglo-American ecocritical tradition stems from and is mostly concerned with contemporary environmental issues. Therefore it relies much on contemporary theory, both literary and social, in order to look into the mechanisms behind the modern misuses of nature through literature. A brief survey of a couple of seminal collections of American ecocriticism (Glotfelty, Fromm 1996; Ingram et al 2007) shows that in its theoretical sources, it draws much from writings in the fields of biology (Eugene Odum, Stephen Jay Gould, but even Jakob von Uexküll in one instance), environmental philosophy (Arne Naess), environment-oriented phenomenology (Edward Relph, Yi-Fu Tuan, Gaston Bachelard), feminist theory (Donna Haraway), cultural criticism (Leo Marx, Raymond Williams, Michel Foucault, Michael Polanyi), language theory (Benjamin Lee Whorf, Georg Lakoff, Mark Johnson), and environmental history (William Cronon). Literary theorists who have provided inspiration and support for the thoughts of ecocritics include Edward Said, Jacques Derrida, George Lukács, Stanley Fish, Alain Robbe-Grillet, Northrop Frye, Mihail Bakhtin, Juri Lotman. These names appear in the references of ecocritical articles relatively sporadically, but the general picture demonstrates well the inclination of ecocritics towards socially oriented research rather than literary criticism that focuses purely on textual features of nature writing, such as new criticism or structuralist poetics.

An important author connecting those two groups is John Ruskin, a Victorian art critic, whose notion of 'pathetic fallacy' (originally coined in his "Modern Painters" III, 1856) has served as a whipping stick in many a dispute between science-orientated and more spiritually minded environmental literary scholars. Pathetic fallacy is a form of personification, a poetic practice of attributing qualities of the animate world to inanimate nature. Ruskin admits that the result may be beautiful and pleasurable, but in his regard, it is at the same time untrue. In his discussion of pathetic fallacy he lists willful fancy and emotional excitement as the causes for 'irrationality' that produces those untrue representations of external things. More precisely, he condemns the tendency to imagine some feeling or mood in a lifeless object (such as a wave or a flower) that is then expressed, using artistic means, such as a poem or a painting. Ruskin brings several examples that demonstrate that he is not totally opposed to the use of speech figures in literature, but he would like to have comparisons of animate and inanimate kept separate from respective contaminations. "Epithets […] descriptive of pure physical nature" in literary representations of nature are fine with Ruskin (2000: 29), whereas attributing emotion to "lifeless" nature is not.

In Estonian material, Ruskinian pathos is echoed in the first survey book on Estonian popular science (Annist et al 1940). In the chapter "On the style of popular science writing" a number of faults are listed that hamper young readers from enjoying nature writing; one of the most unacceptable ones among them being anthropomorphism or projecting of human values and attitudes to the

representatives of the natural world (Annist et al 1940: 28). This tendency is assumed to have taken root by following German models, such as nature writing by Carl Ewald. A Russian author Valerian Lunkevich is also mentioned in this survey as a detrimental example.

The question of pathetic fallacy is addressed in article IV in relation to assigning feelings and urges characteristic of humans to different fish species, in order to underline the intentionality of their behaviour in the situation of fishing. Even Hemingway's "The Old Man and the Sea" is no exception here. To a degree, pathetic fallacy is also present in the Herring letters of the Yankee man, discussed in article V: the foreign seas where the Estonian fishing flotilla works, are depicted as unpredictable, hostile, or, on the day of the first catch, as friendly. These assigned qualities definitely show the crew members' uninformedness of the natural conditions they encounter for the first time in their lives, as well as reflect their feelings. However, there are other explanations for assigning qualities typical of human behaviour to non-human phenomena than mere human inclination towards pathetic fallacy, and these are discussed at length in the following sub-chapter on semiotics. The fact that we as humans perceive the world around us from our species-specific Umwelt necessitates, to a certain degree, the representations of nature that liken the 'outer' phenomena to our 'inner' world plan. By using narrative tools such as pathetic fallacy or anthropomorphisation, it is perhaps easier for us to relate to the world in a more empathetic way. Ruskin's puristic ideas may have lost their actuality in the contemporary ecocritical discussion, but the overall romantic sentiment is still there, as Timothy Morton (2005: 696–707) demonstrates. He associates it especially with the idea of "green consumerism" where various romantic ideas about pristine nature, stewardship of nature, holistic approach, etc. are harnessed to develop the capitalist consumer society where identity is based on consumption. In addition to consuming the "right" eco-products, we might regard even buying books of nature writing and contemplating their contents as a form of romantic "green consumerism". How much pathetic fallacy is involved in such a thought twist, remains to be pondered elsewhere.

2.1.2. Representation and mimesis

Before proceeding to the ecocritical and semiotic understanding of the concept of representation, I have chosen to go briefly back to the classic sources on literary representation in order to anchor my argument more strongly in a traditional literary analysis. Nature writing certainly has its position within the literary system, and thus deserves to be treated as a part of literature; not just as another source of information – be it about nature or about society. As Wellek and Warren (2010: 24) remind us, in literary criticism, the aesthetic value of a work of literature, as well as its style, composition, and expression have primacy over its (mimetic) content.

The classic groundwork of philology, Aristotle's "On the Art of Poetry", claims that imitation is the most essential quality of literature. "The objects the imitator represents are actions, with agents who are necessarily either good men or bad," the 2nd chapter of "Poetics" starts (in the translation of Ingram Bywater; Aristotle 1909; 1448 a1[10]). Throughout the English translation, Bywater has chosen to use the word 'imitation'. Jaan Unt (Aristoteles 2003) has used 'jäljendus' respectively in Estonian translation that is largely based on Bywater's work (Aristoteles 2003: 12). The central object of imitation for Aristotle is action. Events count as action when human agents participate in them. It seems that nature and literary representations of nature have no place in the original Aristotelian idea of imitation. The central aspect of a literary creation is rendering of a story. Imitation is necessarily verbal and contains narrative.

Aristotle distinguishes between three aspects of representation, namely the means, the objects, and the manner of imitation (1448 a25) and remarks that the results of imitation differ from each other because of the different originals that are represented in the form of arts (1448 a9). The 'original', or the primary object of imitation refers to human action. Verbal depictions of the natural environment, animals, and the like that we might think of as 'representations', would not necessarily have been of primary interest to a scholar of poetics in antiquity.

In article VI a special example of nature representation is discussed that could be elaborated also in Aristotelian terms. The botanical nature writing by Haide-Ene Rebassoo features certain plant species, and sometimes even certain plants as individuals, as agents engaged in action, such as growing, resisting to grazing, spreading by the help of other species (birds, humans, bees). Representation of plants in Rebassoo is often directly action-centred: she discusses the routes that the species have taken to arrive at the places where she finds them; she often uses the verb 'travel' to describe the spreading mechanisms of plants. As her focus is on a single species rather than plant communities, the plants can be regarded as distinct 'heroes' of her floristic narrative. Her representations of plants do not conform to our traditional understanding of vegetation as an unspecified group of passive objects. By elevating plant species into the status of agents, whose actions she follows and describes, she gives a distinct character to her nature representations. Species other than humans can, then, also be represented according to Aristotelian principles.

Aristotle further writes that humans experiencing artistic imitation may feel pleasure because of recognising what is depicted (mimetic aspect), or because of the form or some other technical quality of the representation (stylistic aspect). The latter is actualised when the object of representation is not familiar to the person engaged in interpretation – then the form-related qualities of the

[10] References to Aristotle's "Poetics" are made according to the philological tradition, based on the pagination of the academic publication Aristotelis opera, V, by Immanuel Bekker, or the so-called Bekker numbers, the standard form of reference to works in the Corpus Aristotelicum.

representation come to the fore, and dominate the process of aesthetic appreciation. If a reader has no or little knowledge of the species that is referred to in nature writing, for example, the process of mimetic recognition may give way to the contemplation of formal and structural qualities of the text. The same happens when a text is in a foreign language that we do not understand – then our attention shifts to its formal qualities, too. In inter-species' communication, the most evident example of such a phenomenon is perhaps bird song. In most cases, bird song is too fast for the human ear to detect the individual differences in each utterance. We perceive them as species-specific songs or calls; seasoned birders can detect whether what we hear is an alarm call, a mating call, a territorial song or a sound caused by the bird's movement (such as swishing of the wings). Bird sounds and their representation and interpretation by humans is discussed in detail in article III. What we as laypeople are able to contemplate in the representations of birds sounds is rather the stylistic aspect – the sound and its verbal rendering, rather than the mimetic aspect – which bird species is meant in the text and what might the bird itself have meant by its utterance. Being able to appreciate both the mimetic and the stylistic aspect of a verbal representation of a bird sound is indeed a bonus that not all of the readers of nature writing will ever be able to achieve.

While Aristotle focuses on action or character as the object of representation, Erich Auerbach in his monumental "Mimesis" (in Estonian, Auerbach 2012) speaks of representation mainly in terms of time planes, that is, associating representation with narrating techniques. In the first chapter, "Odysseus's scar", he distinguishes between single-plane (Ancient Greek style) and multi-layered narration (Old Testament style) that has historical depth; conceptualising these as two principal forms of representation. Thence, 'representation' for Auerbach is a category that has to do with the temporal disposition of a story. This seems to be an idea that has been often overlooked in ecocritical studies: that nature, as all mundane phenomena, is temporal, it has a history; it alters in time; and that the temporal disposition in a literary text that represents nature contributes considerably to the meaning-creation of that text.

The notion of ecomimesis, launched by Tim Morton (2007) and criticised by Greg Garrard (2010) is understood as the Romantic / romanticising taint added to nature writing in order to make it more "ecologically appealing". It is intended to serve as an authentication device, but when looked at closely and critically, it reveals the dependence of nature writing upon the act of writing, rather than upon the presence of nature. Garrard, however, does not completely agree with Morton's criticism and points out that "the *question* of mimesis has been a central argument in ecocriticism from the outset" (Garrard 2010: 11), and therefore an important subject matter in further ecocritical research.

Lawrence Buell also discusses different approaches to the question of mimesis in his book "The Future of Environmental criticism": he uses the expression "mimetic fallacy" and argues that albeit many critics have suggested that it is something ecocriticism should outgrow, it is a question that deserves further inquiry:

> Not that a single distinctive theory of mimesis and/or reference is likely to command assent from environmental critics across the board. Much more likely will be a continued interest in the matching, or non-matching, of wordscape and worldscape that takes quite varied forms. (Buell 2005: 39).

Buell remarks that there are several approaches available for it in modern literary theory. He lists theorists, such as Paul Ricoeur, Roland Barthes, Fredric Jameson, Francis Ponge, Leslie Marmon Silko, Barry Lopez and others who have pondered the question of the relation between the physical world and its representations in literature. With presenting this array of approaches from which everyone could find one's favourite, he adds a disclaimer, that none of those would be able to "define the totality of environmental representation" (Buell 2005: 41). This is a valuable reminder also in the framework of the present study: the phenomenon of literary representation and its mechanisms can be studied from various angles, and the correctness of the resulting theoretical models can be tested out only in extensive textual analysis.

The mimetic qualities of nature writing are briefly discussed in article II: "Nature writing can be *mimetic* in the sense that the structure or the narrative of the text can repeat certain environmental or physical sequences" (Maran, Tüür 2017: 289–290). It should be added here that temporal sequences may also be the constituents of the mimetic effect. For example, most of the Estonian texts that focus on bird life in coastal areas start out in spring, follow the nesting season of certain birds, and end with the autumn migration, thus mimicking the actual temporal outline of the migratory birds. To add layers to the temporal representation in nature writing, references can be made to preceding breeding seasons, or an epilogue can be added to the story, providing comparison to some other breeding season that was yet to come at the time of the main observation. August Mälk in his "Bird Stories" employs such a technique.

2.1.3. Dual accountability

In an earlier book, "The Environmental Imagination", Lawrence Buell emphasises the importance of "outer" mimesis[11] in environmental writing: the fidelity to shape, image, action, ecosystem ties – "the act of imagining in words the actual but imperceptible" (Buell 1995: 100). Subsequently, Buell explains mimesis as the detailed depiction of details, albeit the selection and sequencing of the details is certainly dependent on the historical conditions, knowledge and taste of the time of the author (Buell 1995: 107). The capability to represent the world precisely may on some occasions be a matter of survival.

[11] The notion originates from the discussion of environmental non-fiction by an American nature writer Barry Lopez, who is in favour of fidelity to known scientific facts about our natural environment and natural processes.

Cultural and literary semiotician Umberto Eco has devoted a chapter, "Possible Woods", to the discussion of the elements of reality in fiction in his book "Six Walks in the Fictional Woods" (1994). He writes: "And so we must admit that in order to be impressed, disturbed, frightened, or touched by even the most impossible of worlds, we must rely upon our knowledge of the actual one" (Eco 1994: 83). The actual, material world should be recognised as background for all textual representations; the latter could not exist without the former. This is an idea that is strongly advocated for by Buell, too. Eco discusses several instances when the textual and extra-textual realities mix or merge and it is difficult to tell them apart, or to say which is primary. He uses several examples of great literary texts that have altered the popular perception of real landscapes, streets and cities because these have become associated with some fictional character or event. Eco points out that in some instances, text as if sticks to the landscape, becomes manifested and re-enacted in the form of literary excursions, "tracking of characters", and the like (Eco 1994: 87). In his paradoxical way, Eco then demonstrates that both fiction and the real environment are always much more complex phenomena than such reductive, albeit popular, attempts to merge a work of fiction and a living environment.[12]

Perhaps the most instructive of Eco's ideas that relates to the analysis of nature writing is the question of the proto-landscape. In the first half of his essay, Eco claims that the observation of the real, geographical places where a novel is set is not necessary in order to understand the text properly: "To be a good reader of Joyce, it's not necessary to celebrate Bloomsday on the banks of the Liffey" (Eco 1994: 84). However, Eco ends his essay on possible woods with the discussion of olive trees in Anne Radcliffe's "The Mysteries of Udolpho". The olive trees are present in Radcliffe's textual description[13] of the setting, as well as in Eco's earlier comment on the excerpt. As Eco has been later informed by a local inhabitant of that particular region, olive trees actually do not grow in Gascogne. The essay concludes with a question about the complicated relationship between the real, the fictional, and the falsely believed. In that regard, paying attention to the relations between the real environment and its literary representation proves to be of importance. With Eco, we may conclude that the interpretation of textual representations of nature depends on numerous aspects: the real environment; the author's knowledge; the reader's knowledge; and the textual representation itself – i.e, what environmental features have been chosen to be represented, and which of these, in turn, are

[12] In the context of the spatial turn, a new approach called geocriticism has recently emerged in literary studies. Geocriticism focuses on the representations of space in literature and it asks how different textual and meta-textual representations shape our perception of the real landscapes and places in actual geographical locations (see Westphal 2011, Tally 2013; for application on Estonian material, see Fridolin 2015).

[13] To add an even more complicated intersemiotic layer, it should be remarked that Radcliffe derived her verbal descriptions from looking at paintings; she had no first-hand experience of the natural environment she was representing.

intelligible for the reader. Graphically, the model of nature-text (see article I, page 225) organises the complex set of bilateral relations into a comprehensive model.

An example of such complex entanglement of the real, the fictional, and the falsely believed in representation is discussed in article V. The Northern part of the Atlantic Ocean that journalist Evald Tammlaan set out to describe in his reportage in 1932 was an area that was previously virtually unknown to Estonians. Tammlaan, as a coastal lad and a yachting enthusiast, had indeed some practical knowledge of the sea and seafaring, but none of the Estonian crew members had any previous experience in ocean fishing, the goal of their voyage. The fishing trip is described in newspaper accounts as an adventurous "quest for herring" where "our Vikings" will colonise the far-away waters and their inhabitants, i.e. the herring. The myth-boosting rhetoric covers up the hard reality of the ocean: that actually there are tens of ships from other countries, chasing the same herring; that the living and working conditions on the board of the ships are harsh; that the economic benefits eventually turn out to be smaller than expected. The juxtaposition of the initial heroic representation of the ocean and the actual troublesome reality gradually opens up over the course of the story. In his reportage, Tammlaan does not admit straightforwardly that his initial ocean depictions must have been distorted, but that is something an attentive reader can find out her- or himself. The fictional understanding of the ocean environment is gradually replaced by more realistic representations of it in Tammlaan's story. For many readers of its time, Tammlaan's stories of Northern Atlantic remained the only contact with this place; similar to many readers of Radcliffe's Udolpho who never actually travelled to Gascogne.

The previous paradox can be associated with the notion of dual accountability that Buell presents as the keystone of environmental representations, with the task of an ecocritic "to reimagine textual representations as having a dual accountability to matter and to discursive mentation" (Buell 1995: 92). It is also a task of the present thesis to explicate the bonds between extra-textual and intra-textual realms. Buell has derived the idea of dual accountability from the writings of a renown theorist of postmodern literature, Linda Hutcheon.[14] In her book "A Poetics of Postmodernism", Hutcheon (1996: 141–157) discusses the problem of reference in historiographic metafiction, and proposes five possible types of reference in a literary text. She draws her material from "fiction proper", from texts that have an intention to be taken as "fictional". Following the direction of thought pointed out by Buell, it is worthwhile to take a closer look at Hutcheon's ideas and to test them out on some examples of Estonian nature writing.

[14] Buell (1995: 93) writes: "One can distinguish at least four levels of reference in literary discourse: to use Linda Hutcheon's taxonomy, the intratextual, the intertextual (the world of other texts), the autorepresentational (the text figured as text), and the outer mimetic (the world outside the text)." In fact, Hutcheon distinguishes between five types; in the above, my approach is based on her original argument.

Hutcheon writes:

> The self-conscious problematizing of the question of reference in philosophy, linguistics, semiotics, historiography, literary theory, and fiction is part of a contemporaneous realization that many things we once took for granted as "natural" and common-sensical (like the word/world relationship) must be scrutinized very carefully (Hutcheon 1996: 156–157).

Hutcheon starts with a "simple" case, pointing out Mas'ud Zavarzadeh's notion of bi-referentiality that regards the non-fictional novel as referring to a) itself and b) to reality. This proposal is based on the "common-sensical" assumption that there is an experiential world outside the book. As such, this understanding suits well in case of nature writing. Hutcheon holds a postmodernist stand that we know the world only discursively, through texts; and the textual relations must be of a far more complex nature. She lists five types.

First, the intra-textual reference of fiction: "fictional language refers first and foremost to the universe of reality of fiction" (Hutcheon 1996: 154), i.e the intended framework of fiction is fiction. Similarly, we can say that nature writing is primarily meant to be understood as a special type of non-fiction focusing on certain (natural) phenomena. There needs to be a reference to a cohrerent textual universe in both cases. A text must be internally coherent in order to function as one.

Second, auto-representation of self-reference: Hutcheon explains – in a true postmodernist vein – that a text must always be aware of itself; of its existence as a text. This idea stems from the above-introduced postmodernist logic that we know the world only through language. Language builds on language; the world in its concreteness is somewhere further away, whereas language is our primary tool for experiencing and conceptualising it. This understanding that all experience is exclusively language-based is not shared in the biosemiotic approach, which is further discussed in the third chapter of the present study.

The third reference is inter-textual: a text always refers to other texts that precede and surround it; an "independent" text is not possible by definition. According to Hutcheon, in many instances, intertextuality appears on the level of proper names, but it can also be manifested in phrases, textual structure, etc. In nature writing, intertextuality appears in the form of references to other nature writers' texts, but also to the same places, photographing angles, encountering of one and the same species, or perhaps even the same individuals. Intertextual ties between pieces of nature writing are discussed in article II. Mostly these references stem from the authors' similar nature experiences when visiting the same places, such as Vilsandi or Alutaguse. They appear on the level of the structure of the text where the sequence of events or the species represented are similar because authors have read each other's text and follow the same text ordering logic. Direct refererences to the writings of one's fellow nature writers is also a relatively frequent feature in the texts of Estonian nature

writers. Earlier I have published an article on intertextuality and intersemiosis in the works of Fred Jüssi (Tüür 2004a: 151–167).

The fourth type is "textual extratextual kind of reference" (Hutcheon 1996: 155). By this designation, Hutcheon mostly means documentary data from the past, especially archival sources, that historical metafiction (but not only this genre) may draw from, in order to establish its claimed connections with the extratextual reality. Nature writing may also rely on historical sources, especially when the temporal qualities of nature and its changes over a longer period of time are to be demonstrated.

Fifth and final reference type according to Hutcheon (1996: 156) is hermeneutical. It means the self-conscious return of postmodern texts to performative processes. It means that a reader must assume an active role in the interpretation of the (missing) text. The fictive world unravels in the interaction with the real world through the reader's intentional intellectual engagement. "Words hook onto the world, at one level, at least, through the reader," Hutcheon (1996: 156) writes. The same is true about nature writing. The references to the real natural world actually work only through the reader: if the reader has no knowledge whatsoever of the phenomena or species represented in a text, the references remain cryptic. Such may be the case in reading botanical nature writing where plants are mentioned in tens, and it is difficult to keep track of what their references are. Such a situation has been discussed in article VI.

In "The Environmental Imagination", Buell points out that the notion of representation should be treated differently in the case of fiction and non-fiction. As Buell's primary interest in this book lies in setting and environment, his understanding of representation mainly embraces the material reality of the world from which the literary text stems, and not so much the characters, actions, or temporal sequence. However, Buell (1995: 88) criticises the idea that language can render the extra-textual world in a transparent manner, as well as he rejects the idea that nature is merely a discursive matrix or an ideological construct. Whereas the first criterion for evaluating a piece of fiction should not necessarily be its faithfulness to "reality", it is necessary to pay attention to the factual dimension of non-fictional texts. Representations of nature always rely on our knowledge and understanding of biological facts. The verbal representation of nature is located between language and the world of objects, and it has to have a certain affinity to both, Buell (1995: 97–98) argues.

He writes that there are differences in representational modes not only between the disciplines, but also between genres, and even between individual works (Buell 1995: 87). There is also the question of distortion, be it deliberate or accidental that occurs when we describe the natural world in a human way, by means of human language, from the standpoint of a human perceiver. The notion of defamiliarisation (*ostranenie*, as termed by Russian Formalists; discussed in detail in chapter 3 in association with the mediation between Umwelten) – a phenomenon specifically characteristic of literary expression, both fiction and non-fiction – could be a suitable explanation here.

2.1.4. Interplay between texts and environments

A study of a nature representation in a Buellian way is presented in article I. In the interpretation of a text of nature writing, "Sounds", by Fred Jüssi, biological and geographical data, as well as information related to local history and folklore, is combined with the assessment of poetics-related qualities of the text. It is demonstrated that both are important in understanding the text's message as well as of the choices that the author has made in representing the natural environment. For example, the location of the particular islet can be detected by the sounds of swans that the author observes: the natural conditions suitable for swans feeding, a remark of which is embedded in the text, combined with the estimated distance that their sounds can travel across the sea, point to Saarnaki islet. In the same manner, the story can be located in time, based on the observed bird species and their poetically reported seasonal behaviour, as well as on the remark about the recently ceased inhabitation on the islet.

Timo Maran remarks that representations are always necessarily contextual (Maran 2007b: 49). The interplay between texts and environments prevents us from making absolute decisions as to which information is or is not relevant in the study of nature representations in literary texts. I agree with Buell here that in case of nature writing, the knowledge of natural facts is at least as important as the capacity to use the tools of literary analysis. Both are important as inputs for the development of our understanding of the world around and within us.

Buell writes that "in the long run the author is committed to offering a model or scheme of the world [---] that we are invited to weigh according to our supposition or knowledge of its plausibility" (Buell 1995: 94). Here, again, the required plausibility refers to both truthfulness to the biological facts and to the inner coherence of the text itself; i.e to the dual accountability of nature writing. But here, Buell shifts to speaking of a model rather than of representation. In the framework of the present study, this distinction deserves to be elaborated in length.

One instance where the difference between model and a "thick" representation becomes evident occurs when we compare nature writing with nature documentaries. In our multimedia-saturated world, nature documentaries and other moving images, as well as photographs, provide a much greater amount of popular information about the environment than nature writing does. Buell argues that it is actually one of the great advantages of verbal representation that it is never fully able to dominate the physical world, unlike visual representations or technologically produced virtual reality[15] might. We as readers are probably more aware of the relational nature of the representations that we are offered in a written text, than, for example, watchers of nature documentaries are. Written representations of nature help us to resist the spreading technological control over reality (Buell 1995: 113). I would add that they also make

[15] For an ecocritical treatment of virtual reality, see Ulman 2001: 341–356.

us think critically about the ways nature is mediated to us by means of human-specific semiotic practices.

Of more recent elaborations on the notion of representation in the literary depiction of nature, Karoliina Lummaa's ground-laying study of birds in Finnish poetry needs to be mentioned. She devotes a central chapter in her thesis "Poliittinen siivekäs. Lintujen konkreettisuus suomalaisessa 1970-luvun ympäristörunoudessa" (Lummaa 2010) to the question of representation, and asks whether birds appear in poetry as symbols of human fantasy or as biological beings that have an agency of their own. Lummaa outlines three possible ways of understanding the notion of 'representation':

> Roughly, representation in the framewrok of the present discussion can be understood in three ways: as mimetic imitation; as based on a cultural construction, or as representing in the sense of speaking on behalf of someone else[16] (Lummaa 2010: 155; my translation – K.T.).

The theorists that she draws upon in her work on representation, include Stuart Hall, Gayatri Chakravorty Spivak, and Timothy Morton. According to Lummaa, Morton's idea of 'eco-mimesis' has been developed, based on an implicit division between inner (cultural) and outer (natural) that is then bridged by help of the so-called ambient poetics. Its aim is to disperse the otherness that is associated with the realm of non-human and to create an immediate experience of the environment. Paradoxically, it means that ambient poetics is simultaneously illusory (based on an illusory division) and post-illusory, as it strives to deconstruct the representation it mediates. (Lummaa 2010: 162–163.) This is an interesting line of thought that deserves further examination, and hopefully can be done in the framework of some other (joint) project in the future.

2.2. Representation and model

A semiotic understanding of the notions of text, representation and model may help us look at literary representations from a different angle, seeing representation of the natural realm not as a secondary, but as a primary concern of critical activity. In the case of certain texts, such as nature writing or ethnographic novels, the aspect of representation may become more important than the aspect of stylistics in appreciating the text in its fullest. This is one of the central principles of semiotic dynamics: that certain features that are marginal in mainstream culture may appear central in texts that are created under different circumstances, according to different (aesthetic) rules (see Tõnjanov 2006: 199–219). Lawrence Buell (1995: 85) contrasts the traditional understanding of the

[16] Karkeasti ottaen representaatio voidaan oman kysymyksenasetteluni valossa ymmärtää kolmella tavalla: jäljittelevänä esittämisenä, kulttuuriseen konstruktioon perustuvana esittämisenä sekä edustamisesna puolesta puhumisen merkityksessä.

representation of nature as setting to the ecocritical understanding of environment as full of agency. Thence, the understanding of representation as a primary or secondary feature of a literary text is not only the question of how the text is made, but also the question of its reception – in what manner are we as critics and/or readers prepared to read the text. There are different possibilities and traditions, indeed.

In my articles included in the present study, I have regarded the natural environment and other species represented as active agents in the process of textual creation, alongside the human author and readers of the text. I attempt to demonstrate such multi-valent agency by means of logically coherent metalanguage, rooted in the philological and semiotic academic tradition.

It is important to analyse the notion of representation for the sake of obtaining a better understanding of human sign-use practices as well as those in action in the inter-species' communication. Studying the representations of natural environment in nature writing requires thus first some philological understanding of the limitations and possibilities of written language and of the ways literary texts are composed and organised. On the other hand, analysing nature writing requires some knowledge of the natural history and of the biology of the species, biotopes and ecosystems featured in the texts of nature writing. Only then is it possible to compare the representation to the current state of knowledge, and to detect how the representation has been shaped by the level of knowledge and by the ideological trends prevailing at the time of its writing that adds a historical dimension to the analysis.

In the following, the relation between representation and model is discussed. This is necessary for achieving terminological clarity, which is especially important in inter- and transdisciplinary endeavours, such as the present study that seeks to integrate ecocritical and semiotic study of nature writing. The specific questions of practical transdisciplinarity are discussed in chapter 3 of the present introduction.

2.2.1. Text and model

Tartu-Moscow school of semiotics[17] regards language as the primary modelling system, and art – including literature – as a secondary modelling system.[18] Zoosemioticians have added a third layer – zoosemiotic modelling – that underlies language and art as human-specific modelling systems. That layer is discussed in chapter 3. Juri Lotman (1991: 8) defines *model* as an analogy-based substitute

[17] In the following, shortened as TMS.

[18] "Under secondary modelling systems we understand such semiotic systems, with the aid of which models of the world or its fragments are constructed. These systems are secondary in relation to the primary system of natural language, over which they are built – directly (the supralinguistic system of literature) or in the shape parallel to it (music, painting)." (Lotman et al 2013: 72).

to a perceived object in the process of cognition. Language is understood as not necessarily verbal, but it can be any set of rules for joining certain elements into an intelligible system (Lotman 1991: 9), such as cinematographic language or the language of everyday culture. Thence, art in the sense of TMS is always an analogue to perceived reality, expressed in a specific language. Whereas art is a modelling system; a work of art, such as a literary text, is realised as a model. A model includes representations of perceived reality, but it does not copy it – precisely because of the specific nature of literary language. Lotman points out that a model realised in the framework of a secondary modelling system is always more ample than its instances of interpretation: whenever a work of art is rendered in a regular language with the mere purpose of transmitting information, there occurs a surplus "untranslatable information" characteristic of art (Lotman 1991: 25).

Proceeding from Lotman's ideas, the relation between representation and model can be explained on the example of nature writing as follows. Literature is a modelling system. A piece of nature writing is an artistic model of a certain aspect of the natural world that is realised in a special (verbal) language, namely in literary language. This also means that the model that is created differs from, let's say, a purely scientific model of the same phenomena by its "untranslatable" artistic quality. It cannot be said that a model realised in a certain modelling system (such as literature) would be in some way better or worse than a model realised in another modelling system (such as statistical analysis) – they are just different (see Lotman 1991: 31). Both have the capacity to increase our human understanding of the world, and both provide different ways of relating to the model itself as well as to the modelled phenomena. Each model contains a series of representations that are devised in accordance to the coding rules of the particular modelling system, in the framework of which they are realised. Even cultural analysis itself can be regarded as a particular modelling activity (see Salupere, Torop 2013: 22).

Here, the relation between representation, model, sign and text needs to be clarified. Text is the fundamental concept of the Tartu-Moscow school of semiotics. As it is explained in the "Theses" (Lotman et al 2013: 53–77), 'text' is understood as a basic unit of culture, meaning not only "messages in natural language", but any phenomena that carry an integral meaning (Lotman et al 2013: 58). 'Text' is not a fixed entity or universal structure. In the view of TMS, text can appear as an integral sign or as a series of signs, i.e, the concepts of 'sign' and 'text' may overlap in certain instances. In a most general semiotic (Peircean) understanding, a 'sign' is "something that stands for something else in some capacity for *someone* (or some organism)" (Cobley 2010: 11). In Lotman's view, sign is a discrete entity, whereas text is a continuum with its boundaries, inner organisation, and particular function in relation to the extra-textual reality (see Lotman et al 2013: 58–59).

Salupere and Torop (2013: 25) explain the relation between language and modelling system, outlining the different ways in which 'language' could be understood. Language as a primary modelling system in the sense of TMS is

"natural" human (verbal) language. In the sense of a secondary modelling system, language can be in the position of 1) a complex sign system based on verbal language, such as myth or literature; 2) a metalanguage that describes and interprets some cultural phenomena, such as art or dance; 3) a model or an analogue, such as language of film. Thence we see that the semiotic terms 'language' and 'modelling system' can be mutually interchangeable under certain conditions. Salupere and Torop (2013: 26) also point out that "cultural language" and "sign system" are used as synonyms in "Theses on the semiotic study of cultures".

Lotman focuses on artistic models in his writings. On one hand, individual models are always created within the limits of a particular modelling system, such as literature. This is a selective process, because the author gets to decide which traits of the object are necessary to be featured, and which could be omitted as insignificant in the particular act of model-making. Model becomes realised as a text. On the other hand, Lotman (1991: 25) emphasises that an artistic model is always greater than any of its interpretations: each reading activates but one possible way of understanding the text, and the number of the possible interpretations is not limited in the case of artistic creation.

In his comprehensive discussion of modelling in the framework of semiotics in "The Routledge Companion to Semiotics", Kalevi Kull (2010: 49) points out that a description of a semiosic object can never be complete or exhaustive. He understands modelling more amply than Lotman, claiming that widely understood, life is the process of modelling (Kull 2010: 48). In addition to human cultural modelling in the sense of primary and secondary modelling systems, Kull's idea of modelling embraces Umwelt as a species-specific model of the world. Thence, he concludes, modelling is both tool and object for semiotics (Kull 2010: 48).

Perhaps one of the most concise formal introductions to the semiotic concept of model has been presented by Czech philosopher Ladislav Tondl (2000: 81–89). He underlines the inherently semiotic nature of models: they are devices for information transfer, and are therefore crucial in the functioning of any sign system. Tondl regards model as a homomorphic representation of its object in the real world, where the choice of relevant elements determines how well the model would function. He proceeds from the understanding that models are characteristic of human culture, and distinguishes between three types of models: verbal (e.g. a literary text); formal (e.g. a mathematical formula or a programming language); and graphic (e.g. a diagram) models (Tondl 2000: 82). Besides the verbal ones, nature writing sometimes makes use of graphic models. As it was indicated in the discussion of the typical traits of nature writing in chapter 1, a piece of nature writing may contain graphic elements, such as tables, diagrams, lists, but also photographs and drawings that support the information provided in the text. Formal models seldom appear in nature writing. In article V, the sources that have been used to write the analysis belong to different model types. Archival documents give us a series of numbers – amounts, measures, tax rates. A newspaper gives us a satirical poem about what is perceived as unfair

tax policy. Both stand for the same situation, but with different means and different aims. They become more comprehensive if we contextualise them and give a joint analysis of both model types just as is done in article V. In order to study different model types simultaneously, some thinking beyond the boundaries of one's disciplinary approach is required. This challenge is discussed in more detail in the second half of chapter 3.

We can agree with Tondl that these three model types do not exclude each other, but that they can work together in order to guarantee successful information transfer. In the case of a relatively complex object, such as the representations of natural environment, the combination of different model types is a logical choice.

2.2.2. Model as interface

According to Tondl (2000: 85), "model is not a complete or entire copy; it is a sufficient representation of the original for a selected set of tasks". In this quotation, he does not discriminate between model and representation, but here it is important that he emphasises the pragmatic function of a model: it is always prepared to meet the requirements of certain tasks. This is true in the case of artistic models, such as nature writing, too – their most important task being, indeed, keeping up literary communication. A model features carefully selected qualities of real objects, leaving at the same time aside a number of other qualities that appear less relevant to the author of the particular model. Tondl (2000: 82) points out that each model presupposes sufficient competence from a receiver, including the knowledge of the qualities of the object that have not been included in a model – in our case, that have not been explicitly covered in a piece of nature writing. Maran (2013: 831) lists climate, relief, flora, and diurnal cycles among the realia that are generally not described in detail in nature writing, assuming that this information goes without saying. If some of this information is not known to a reader, the story, and the natural environment of which the story is a model, may remain cryptic.

In order to create a successful model, the author must have knowledge of 1) the object; 2) its context; 3) the model user's competence; and 4) the function of the model (Tondl 2000: 86). On the example of nature writing, it means that modelling should take place on the basis of the author's knowledge of the natural phenomena and of their historical development, as well as him/her being aware of a potential reader's competence in matters regarding nature and nature writing; and s/he should preferrably have a clear idea of the function of the text.

In science studies, the notions of representation and model are closely related. In his article "How models are used to represent reality," Ronald N. Giere reminds us that representing is primarily a pragmatic activity, just like learning and using language are. Each representation has a purpose: "Scientists use *models* to represent aspects of the world for various purposes." (Giere 2004: 747). Therefore, Giere arrives at a relatively semiotic idea that models do not

represent anything by themselves, but it is the constructor of the particular model who does.

Tondl (2000: 87) also lists the necessary competences of a model's receiver: 1) linguistic competence; 2) knowledge of the object; and 3) understanding of the model's sign system. This is well in accordance with the idea of nature-text, discussed in Maran (2007b) and elaborated in article I. Nature-text binds together the knowledge of the object of representation, i.e the natural environment in our case, in the writer's as well as in the reader's minds. The competence of the reader should match the competence of the author, in order to transfer the information successfully. Tondl (2000: 88) understands model as an interface between a sender and a receiver, or between an internal system and external environment. The same can be said about nature-text. As an interface, it mediates and synchronises the representations that different subjects may have in regard to the environment.

Tondl (2000: 83) points out that a good model includes not only information transfer from subject to subject, but also information transfer in time. Models are used to project the future, as well as to reconstruct the past. In his article on an ecosemiotic approach to nature writing, Maran (2010: 79) reflects on the discrepancy between his personal nature experience and what is described by Johannes Piiper in one of his pieces of nature writing at the same location half a century earlier. This comparison makes evident that nature changes over time, and that we are able to perceive it clearly only by means of using models. Nature writing as a verbal model featuring historical alterations in nature appears to be marginal in our contemporary cultural communication. Graphic models, such as maps, photographs, or even statistical data, transfer the knowledge about historical change at least as effectively as, and perhaps faster, than verbal models. At the same time, our human culture is largely based on stories and storytelling, and the impact of this practice should not be underestimated. Nature writing reveals the historical nature of nature – thence, it should be studied not only as a synchronic model, but also as a historically dynamic phenomenon.

Model contains twofold information, Tondl (2000: 85) writes; that is, information about its author, and about its object. This brings us closer to the notion of autocommunication as a meta-representational activity. By modelling nature in written form, the author models his/her personal understanding of the environment and the resulting model can be later used to gain information about the author of the model and about the respective culture more generally. Maran (2013: 831) has proposed that the results of representational activity, such as writing, can be regarded as modelling on a meta-level. This is well in accordance with Kalevi Kull's idea about four natures in the semiosphere. In Kull's model, it is also important to bear in mind that all the sign processes and modelling activities that he describes, have a recurrent effect, i.e the semiotic activity has an effect on the original activity that it models. As researchers, we need to acknowledge this dynamic, and Maran's idea of "modelling on meta-level" seems to be appropriate for this purpose.

2.2.3. Perception and modelling

The zoosemiotic understanding of 'representation', as presented in the beginning of the current chapter links representation to perception: they are mutually interdependent. Kalevi Kull describes four levels of nature perception in his article "Semiotic ecology: different natures in the semiosphere" (Kull 1998: 344–371). His approach is based on the Umweltlehre of Jakob von Uexküll, encompassing both human perception of and influence upon the surrounding environment. Kull adds a layer of representation and the conditioning of nature by representing it by means of human-specific sign systems, such as literature. From an ecosemiotic perspective we must certainly admit that humans are a part of nature just as all the other species. However, we have to bear in mind that 1) the human perspective is what we are capable of experiencing and analysing most fully and thoroughly; and 2) the human is the rare species who is capable of using abstract signs that are completely detached from the environment and the phenomena that they refer to. Therefore, it is possible to think of humans' relationship with their environment in a specific way, making use of bio- and ecosemiotic grounding principles.

According to the gradual "flow chart" outlined by Kull (1998: 355), first, there is zero nature, i.e. nature that is beyond human Umwelt, i.e. unperceived by humans and therefore nonexistent for them. By definition, there can be no signifying relations or meaningful ties with something that is not perceived – or imagined. This realm may well be present to some other species' Umwelten, but as the burden of interest lies in the human representations of nature in the present thesis as well as in Kull's treatment, the other species' perceptions may not come across to humans in any ways on this level.

First nature is nature as perceived: felt, distinguished, sequenced by human perceptual organs. These actions help us to break the natural environment into smaller units of perception that can be linked to our senses and thus "internalised", incorporated into our human Umwelt. During the same process, we also detach our perceived objects from their "natural" environment: "Recognition of an object, at least to some extent, decontextualises it" (Kull 1998: 353). For example, if we move around in our environment, we can perceive the distance of different objects; feel the softness or the hardness of the ground with our feet, experience the light, temperature, and humidity conditions, hear the sounds and tell them apart from each other according to their acoustic qualities that our ears are tuned to catch. The ultrasound made by bats in their nightly insect hunt trips does not belong to our first nature level for the simple reason that we can not hear it without elaborate mediation, based on our knowledge in biology and physics, and on human advancements in technology.

Second nature in Kull's sense is nature that has been affected by the activities of humans, be it studying, limiting, fencing, hunting, excavating, picking, or any other activity where humans intervene with the rest of the nature. Second nature is altered according to human needs, but it is still happening in physical reality, not in an abstract sphere of signs. Human impact on the environment

may alter it so that we can physically perceive it, such as in the case of quarries, garbage dumps, deforested areas, etc., or in ways that are not easily perceptible, such as in the case of chemical pollution, radiation, electromagnetic waves, etc. Second nature is thus what we sense around us daily, the so-called man-made environment, if we consider trails, tracks, boat routes, and the like as man-made features in the environment, too. Kull (1998: 355) uses the expression "material translation" to describe the second nature.

Third nature, then, has to do with representations, or "semiotic translation" (Kull 1998: 355). Human species-specific ways of representing the perceived and materially affected environment include iconic representations, such as landscape paintings, photography, or elaborately designed parks; indexical representations, such as land art or other temporal interventions into natural environments or animal bodies with artistic aims, and symbolic representations, such as music or literature. Human representations of nature always bear the mark of our own Umwelt, as well as of our cultural understanding of the notions of nature, natural, human, and art, to name just a few. In this article we can also see the eary stages of the notion of biotranslation taking shape.

In case of nature writing, we thus deal with an outstandingly complex set of perception and alteration processes of the environment that are framed by our cultural value sets and attitudes. According to Charles Sanders Peirce, all signs latently contain three basic aspects, namely these of icon, index, and symbol. The same is true about the three different natures in the semiosphere that Kull distinguishes: all the previous stages are always implicitly present in the more complex ones, and their traces can be detected in the most elaborate and symbolic levels of representation that are available to us. At the same time, the natures modified by humans in turn affect the previous layers; eventually, the zero nature is controlled by the imaginary third nature (Kull 1998: 335). This is also one of the guiding principles of the present thesis as manifested in the included articles: although the literary qualities of nature writing are of primary importance in a literary analysis indeed; we must also take into account the other levels of perception and modelling of nature/environment where the symbolic representation is based on. This may be called the ecosemiotic grounding of the present analysis.

The four natures in the semiosphere as outlined above are based on the assumption that nature is never given to any perceiver in its immediacy, but that each species 'filters' it according to its subjective Umwelt. Humans add their cultural expectations, experience, and stereotypes to the biology-based filters. When we think of nature representations in a multi-species' context, it is evident that nature writing embraces the positions and viewpoints of other species, too. At the same time, literary representations are exclusively accessible to human species. Nature representations in other media, such as photography or film, may provide possibilities for other species to relate to them – for example it has been suggested that some vertebrates are able to recognise their conspecifics on screen (see Anderson 2000: 381–382).

2.2.4. Language and modelling

Timo Maran in his discussion of biosemiotic literary criticism distinguishes between three levels of modelling in a text of nature writing: zoosemiotic, linguistic, and artistic modelling (Maran 2013: 835–836). From the operational viewpoint of a nature writer, the text is born exactly in this sequence, also following Kull's logic about the development of different natures in the semiosphere: first, bodily experiences of nature and the zoosemiotic level of modelling; then verbalising one's experiences, i.e. the linguistic level; and finally the third level, artistic modelling of the previously gained experiences. In contrast, when we study a piece of nature writing, we would generally start with the level of artistic modelling – the structure and the style of the text, the used literary devices and their symbolic layers, etc.

Linguistic analysis focuses on naming, pointing, and describing; in short, on pragmapoetic aspects of a text. On the level of phonetics and instrumentation, nature writing is a rich source of study material. Especially in the representations of sounds of nature, such as bird sounds, the choices available and selected from human verbal language are remarkably varied: different traditional cultures render natural sounds with different intensity, intention, and mechanisms. Cognitive landscapes (cf Farina 2006: 5–17) in different places are remarkably varied, and they often play an underestimatedly big role in human culture, as well as in the lives of other species. How sounds are imitated by means of written language, provides a lot of brainfood for comparative study and reasoning.

Linguistic analysis of nature writing has been applied in article III, in association with the question of representing bird sounds in nature writing and in ornithological reference books. Human rendering of bird sounds, using the modes of expression available in verbal language result most often in representations that are based on iconic sign type. Following Peirce's basic sign types, as elaborated in Sebeok 1994, we can differentiate between three general sign types: iconic (of similar shape or sound); indexical (a track of something), and symbolic (abstract, sometimes with no reference in the physical reality).

Humans share with other animals the ability to use the first two types of signs. Literature is based on the third type. However, the other types of signs are present in literature, too, especially in the case of nature writing. Words denoting sounds are often of iconic quality, and that is especially true when it comes to rendering sounds of other species in human language.

The iconicity of sound has been briefly discussed in literary theory, too. Wellek and Warren devote a chapter to sound, rhythm, and metre in their "Theory of Literature". Among other sound devices they discuss onomatopoeia and verbal representations of nature sounds that, as they admit, have earned too little attention from the literary scholars so far (Wellek, Warren 2010: 225). Imitating natural sounds can be regarded on three levels, they propose. The first level is direct imitation of physical sounds, such as in "cuckoo". On the second level, sounds are reproduced by choice of words which produce certain sound

patterns, reinforced by their lexical meaning, such as "the murmurings of innumerable bees". The third level is related to conventional sound symbolics that has universal traits across all languages, such as high vocals that are perceived as denoting something small, high, and dynamic, whereas low vocals symbolically stand for slow, dark, and perhaps even dangerous phenomena. They call those associations phonetic metaphors. (Wellek, Warren 2010: 225.) All of these sound devices are in use in nature writing, and can perhaps even be considered one of nature writing's trademarks. In my first more extensive study of Estonian nature writing (Tüür 2003), the usage of sound and instrumentation was discussed in association with metaphors and folkloristic information. The work itself attempted to explicate coherence in a larger set of texts, and it was not especially devoted to studying individual pieces of nature writing. In the articles included in the present thesis, more attention has been granted to the qualities of some selected pieces of nature writing, including their sound and instrumentation devices. Article III is especially relevant in that regard, providing several examples and their analysis of the instrumentation and audial iconicity in the depiction of bird sounds in nature writing.

In "Theses on the semiotic study of cultures", members of the Tartu-Moscow school have outlined a comprehensive scheme where they differentiate six levels of reconstruction that should be considered in a semiotic study of a literary (or more widely, cultural) text. It is proposed that a text becomes "unrolled", starting from the general intention (or idea) of the text, moving to the subsequent levels of semantic blocs, syntactic structure, and finally to the phoneme level (Lotman et al 2013: 66–67). This scheme appears to be most appropriate for poetry analysis, but as the authors emphasise in their explanation, it is applicable in the study of very different cultural texts, from manuscripts to rituals to ethnographic items and even food.[19]

It is instructive to make a brief excursion into the TMS explication of the levels of reconstruction in order to detect the relevance of the approach in the study of nature writing. First, there must be some sort of social agreement in the culture about what the valuable parts of nature are that need to be featured in public – most often these are places of spectacular, pictorial qualities rather than waste dumps, wastelands, or the like. The ideological way or representation may also be of crucial importance in some cases. For example, under the Soviet ideology, nature writing glorifying extensive agriculture was favoured over texts containing merely asethetic contemplation.

It is therefore important to look at nature writing not only on the level of a represented individual or on the level of the species, but also on the level of the whole culture and ecosystem. How does that particular ecosystem work? What are the species and the activities that ensure the persistence of this ecosystem? What roles do the represented animals have in the maintenance or destruction of

[19] These ideas have been developed further in the Hungarian tradition of ethnosemiotics; see, for example, Hoppál 2008.

this ecosystem? What are the important species in the context of this particular ecosystem, and do they receive any attention in the story? If they do not play any role on the textual plane, then what are the reasons for this? The reasons, indeed, may be both related to the artistic choices, but also to the author's cultural preferences and perceptions. One reason why some key species in the environment remain invisible in the texts of nature writing may also be the sheer lack of informedness of the writer – or the overall level of natural history knowledge at the time of writing. It is important to take into account the knowledge of biology, but also the prevailing ideology in respect to how nature as such is conceptualised in a particular era in order to be able to make correct judgements about the author's intentions in the choices s/he has made in her/his stories. The knowledge of who remains invisible is as important as the knowledge of who the story is "about". This is an idea that has been widely applied in feminist literary criticism, but not so often in ecocriticism, so far. That approach deserves more attention when practical ecocriticism is excercised.

When we move on to the level of a particular publication itself, the choices of the author come to the fore: which species, biotopes, or times of the year have been chosen to be featured in the text? How is the text sequenced? According to Lawrence Buell (1995: 397), there are different typical ways of organising the books, as well as the individual pieces of nature writing: as a ramble, as a seasonal cycle, as a sequence of species, as a sermon, etc. The way in which a book of nature writing is composed as a whole from its smaller units, i.e. chapters, is determined by the preferences of the author, as well as by the particular ideas of nature and its organisation that have been prevailing at the time of its writing. Thus, the composition of the book is an important part of its representational qualities, and should be taken into account in the analysis. Thence, the notion of poetics is important to bear in mind: each text of nature writing belongs to the literary tradition as well as to the environment it represents, and it must follow the rules prescribed by both.

On the level of text, the sequence of how natural phenomena get represented is of importance. If a species is introduced to us in the text, what are the features we are presented first? How does the overall impression of the species or of the biotope change over the course of reading the piece? Does the author's attitude alter, or direct the reader's attitude to a different direction than it was initially set?

The choice of words is also something to be carefully taken into account: is scientific jargon preferred over plain language, or is the text ornamented with epithets and genteel language? Are other species anthropomorphisised or objectified? All of this contributes to how the representations of the natural environment are suggested to the readers of nature writing.

The phonetic level of textual representation was discussed above in association with iconic representation. In conclusion, it should be admitted that verbal language, the human-specific communication vechicle, is of great importance in understanding the phenomenon of nature writing, as well as of its reciprocal ties to the natural environment in its entirety and diversity. We can

talk about meaningful ties with the environment that are created on the basis of our evolutionary development, on the basis of our personal embodied experiences, and on the basis of our culturally conditioned mindset and stereotypes. Human language is also part of our species' evolutionary adaptations, thence closely associated with the rest of nature. In texts that have the task of bringing to the fore the connections between culture and nature, paying attention to language and the plane of expression is inevitable.

Wellek and Warren remark (2010: 212) that the difference between literary language and everyday language is that the former brings expression to the fore, whereas in regular communication we use language to get the message across. This is supported by Lotman's argument that art is a cognitive device and a means of communication, similar to language. In TMS, where language is regarded as the primary modelling system and art as secondary, based on the first, the language of literature is of special importance. Lotman writes that literature differs from all the other secondary modelling systems because it uses verbal language as its material (Lotman 1991: 48). As discussed above, nature writing can be regarded as modelling on a meta-level, according to the ideas expressed, among others, by Timo Maran (2013: 838) and Kalevi Kull (2010: 44). I hope to have demonstrated with the above discussion of all those ideas that figurative language plays an important part in the creation of literary representations of nature, but that it is also very important to take into account the general modelling processes that we as one species among all the others are using when making sense of the world around us.

2.3. Interim conclusions

Lawrence Buell has argued that a text of non-fictional nature writing relies on the biological reality of the world as well as on the properties of (literary) language, and that the study of representations in such texts should take into account both aspects – those of biology and language. This is where semiotics can help us to bridge the gap between the discursive-constructionist and the biological-mimetic approaches to the study of representations of nature.

In the present study, sign is understood in its classic Peircean meaning, and text in its cultural semiotic meaning, that is, wider than text in the strict sense of philology-based literary theory. The notion of representation has not been extensively theorised in the framework of semiotics so far. The starting point for the present (semiotic) understanding of the notion of representation comes from zoosemiotics (Tønnessen, Tüür 2014: 7–30); the ideas about representation stemming from classic literary theory have also been taken into account. It proved to be necessary to delve into the possible (historical) meanings of this concept, in order to be able to propose my own synthesis. Representation in nature writing is a hybrid phenomenon that is conditioned by cultural conventions as well as by our species-specific Umwelt.

On the example of nature writing, it can be said that an individual piece of nature writing is certainly a text in written verbal language, sometimes accompanied by texts in other sign systems, such as graphic illustrations. As such, it is part of a larger set of cultural texts, and it binds together the realms of human culture and our natural environment in the form of nature-text. A piece of nature writing contains representations of nature. The choice and sequencing of these representations within the limits of one particular text can also be considered as modelling activity. Modelling is understood here in the sense of Tartu-Moscow school of semiotics, as creating a certain possible way of interpreting the world. Nature writing, understood as belonging to the realm of literary creation, that is, a secondary modelling system, is by no means an immediate reflection of "nature out there", but it is a complex vechicle of human Umwelt, language, and cultural convictions.

Model is a tool for communication, be it scientific or literary communication. A model relies on the representations of its target objects, as well as on the specific language that is used to make it. A model does not work all by itself, but it only functions properly in communication, i.e. in the situation where it is interpreted in a meaningful way. A piece of nature writing does not make sense to a non-human animal, neither as a model, nor as a representation (or a sequence of representations). At the same time, verbal texts are, along different audiovisual sources, among the primary sources of contemplation of and information about nature for contemporary (urban) humans.

As Ladislav Tondl has pointed out, model is a multi-valent instrument. It can be a model or a representation that is formed according to the distinctive features of its object; but it can also be a simplified representation that helps to convey the basic meaning of its object to the reader of the model. We model the world, based on our human Umwelt, according to the elements in our environment that we are able to perceive, name, and alter. In analysing literature, we must also take into account the levels of perception and modelling, upon which the verbal, symbolic modelling is based. Or, in terms of biosemiotics criticism – all the three levels, zoosemiotic, linguistic, and artistic modelling deserve scholarly attention. When we proceed from the ideas of Tartu-Moscow school of semiotics in literary analysis of nature writing, it is also useful to consider the artistic modelling as consisting of layers, from the general idea of the text to the minute meanings expressed on phonetic level. On each level, the question of choices arises – of the represented phenomena, environmental elements, used vocabulary and style.

3. METHOD: SEMIOTICS AND BEYOND

The core of the present research is semiotics. Both natural processes and cultural phenomena are regarded here as based on sign relations. Semiosis is communicational by nature, i.e, it requires successful transformation of information from sender to receiver and vice versa. It also involves feedback and mutual adjustment of the subjects engaged in communication. In the case of nature writing, these semiotic ties are of a relatively complex nature, embracing the text, reader, author, represented species, their Umwelten, and their environmental experience. Therefore, semiotics provides a good platform for the study of nature writing because of its universal approach and meta-language that is suitable for describing and interpreting a wide array of communication-based phenomena.

At the same time, in some particular cases help is needed from other disciplines, too. In the articles included in the present thesis, additional input for analysis has come from history (article V) and biology (article VI). This brings up the question of inter- and transdisciplinarity, of combining methodology and approaches from different disciplines into an integrated research attempt. In the following, an overview of the (bio)semiotic grounds of analysis is given, followed by the discussion of the possibilities for how to integrate a semiotic approach into the wider context of environmental humanities. Both general methodological issues and more specific questions of research design and implementation are touched upon. The ideas presented in the following might be of help for other scholars who set out to do cooperative research across disciplinary borders.

3.1. Semiotics of nature

What is the importance of understanding the other species around us? The simple answer might be: ecology. If we understand the whole Earth as one ecosystem, all of its components linked to each other through mutual ties that make up one working system, then it is inevitable that in order to keep the system functioning, we should know as much as possible about its elements and their connections. Ecological understanding relies on biological knowledge. Biology studies individual species, their reproduction, behaviour, and environment. It is generally done from the presumably objective view point of science, without taking into account the facts that

1) the observer belongs to the human species with its species-specific Umwelt;
2) the research objects also have their subjective Umwelten;
3) they can mutually influence each other.

When a researcher starts to ask questions about inter-species' communication or just about inter-species' contacts that may not even happen intentionally, but what in fact are a part of our everyday reality, then science alone is not enough.

Semiotics, including bio-, zoo-, and ecosemiotics, prove to provide valuable tools for analysing and understanding the mutual ties living organisms have with each other. What the practical outcome is of such research is that we as humans may be better equipped with the knowledge of how not to break the ties that are vital for our own survival as a species, and for that of the ecosystem as a whole.

An Umwelt-centered approach to nature writing focuses on the depiction of animals: what are the features of an animal that are chosen in nature writing to represent its life? How do we as humans have access to the featured aspects of its life? What are the possibilities of inter-species' communication, based on nature writing? In order to find answers to these questions, we must first make a brief methodological excursion into the realm of biosemiotics.

Jesper Hoffmeyer has proposed a schematic depiction of the relations between culture, (outer) nature, and an organism (inner nature). He positions those three nodes in a triangular relationship with each other, and points out that the realm of biosemiotics lies in the study of the relations between outer and inner nature (i.e, an organism): "we must learn to understand how we as people fit into the natural world that produced us" (Hoffmeyer 1996: 96). The realm between an organism (or, the inner nature) and culture is proposed in that scheme to be best studied as psychosomatics. In Kalevi Kull's development of Hoffmeyer's scheme, the study of the relationship between culture and environment (or, the outer nature) is the realm of ecosemiotics ("environmental area" in Hoffmeyer). In the discussion of the relationship between bio-, eco- and zoosemiotics, I have proceeded from this preliminary scheme, and developed it based on the writings of other biosemioticians on the way.

3.1.1. Biosemiotics

Biosemiotics is based on the recognition that life processes and life as a phenomenon are communicative by nature (Kull 2011: 162). The central question for biosemiotics is the problem of the semiotic threshold: where exactly on the micro-levels of biological life are mechanical correspondences replaced with connections that are based on meaning and communication? The focus of biosemiotic research is on sign processes that take place on molecular and cellular levels. A lot of research is dedicated to DNA replication mechanisms and the meaning-creation that takes place on the most minute levels of life (see, for example "Biosemiotics", Hoffmeyer 2008). It is an object of keen discussion, from which level of complexity in living systems we can regard the exhange of information as semiotic, i.e containing interpretant and meaning-creation, in addition to the merely causality-based physical connections. As the present article operates on the level of species, more precisely on the level of individual representatives of the species involved in a communicative situation described in nature writing, the biosemiotic debates concerning the more elemental levels of natural organisation are set aside. It is important to be aware of these

discussions, because what goes on on the molecular level definitely influences the life processes that are manifested on the phenotypical level. However, they are not dwelt upon here in the length, because the minute, molecular sign processes rarely get represented in nature writing. Source materials for studying micro-level biosemiotic processes are different and can be found elsewhere – in science papers, for example.

Kalevi Kull has carefully mapped Juri Lotman's ideas about biology in a semiotic context (Kull 1999: 115–131). In addition to Lotman's more or less direct instances of engagement in the questions of theoretical biology, Kull points out that the notions central to Lotman's cultural semiotics can easily be implemented in biosemiotic studies – such as the semiotic barrier, meaning-generating mechanism, semioticization of body, border zone, as well as the notion of semiosphere itself.

The cross-pollination of semiotics and biology has taken place in other directions, too. The manifest of the 'semiotic turn' published in 1984 by a group of outstanding cultural scholars (Anderson et al 1984) brought some important terms into the meta-language of semiotics from the realm of biology, such as Umwelt, co-evolution, symbiogenesis (Kull 2011: 159).

The attempts to connect and reconcile the linguistics-based and biology-based branches of semiotics have been made by Timo Maran, who has used ideas stemming from biosemiotics in developing biosemiotic criticism (see Maran 2013: 824–847; Maran 2014: 297–311). Maran departs from the same basic idea as expressed above: that all relations between biological species and organisms, their relations with their environment and the physiological processes that take place inside the organisms are based on signs and sign exchange. Therefore, cultural phenomena, including literature, should be studied, proceeding from the basic biosemiotic understanding that sign processes organise life in its diverse manifestations from the very basic levels of biological life on (Maran 2013: 827). Literary texts as communicative vechicles are analogous to the natural environment that is full of semiotic activities of numerous species. By representing these perceived activities in written, belletristic form, a partial access to the Umwelten of other species is created, and a possibility for further, extra-textual communication is opened up. The task of biosemiotic criticism is to reveal the mechanisms employed in nature writing (or, in literature in general) for modelling the meaning-connections between organisms and their environment.

3.1.2. Ecosemiotics

Ecosemiotics can be regarded as an adjacent field of biosemiotics, as it focuses on the study of semiotic processes beween human culture and natural environment. In the very early stages of conceptualisation, Kalevi Kull (1998) and Winfried Nöth (1998) both proposed their views on ecosemiotic research. They soon agreed that ecosemiotics may be imagined in two 'branches': biological

ecosemiotics and cultural ecosemiotics (Kull, Nöth 2001). Biological ecosemiotics, or "semiotic ecology", as it was preliminarily termed, focuses on the semiotic mechanisms that are at work in ecological processes. In his introductory article, Kull proposes that integrating a semiotic understanding into the human cultural ecological consciousness might help us "to reach a semiotically sustainable world" (Kull 1998: 347). Nöth agrees with Kull in seeing a great potential for applied research in the future ecosemiotics. He associates ecosemiotic ideas with the pansemiotic view that "nature is semiotic throughout" (Nöth 1998: 334) and also discusses the question of the semiotic threshold, that has later shifted to the questions pondered in biosemiotics proper rather than ecosemiotics. The latter has developed into a more "cultural" direction, with its main concern in the interrelations between human culture and its natural environment.

Timo Maran has described the realm of ecosemiotics as follows:

> Ecosemiotics can differentiate our relationships with nature by asking what kind of meaning processes are involved in nature experience, what meanings they generate, and how these meanings can be categorised. (Maran 2010: 83).

Ecosemiotics helps to explain the relationships between humans, human culture, and other species; taking into account not only the Umwelten, but also the humans' cultural needs and their ways of representations. The latter are an inseparable part of human Umwelt, but there is no common agreement on which role culture and representations might play in the other species', especially in the big vertebrates' lives. Thus the point of view in ecosemiotics, in contrast to zoosemiotics, is located in the human Umwelt. It is studied how human culture creates meaningful connections with the other species and with the environment it inhabits. In addition to that, as the 'eco'-designation suggests, it is necessary to understand that humans are not necessarily in the centre of this web of meanings, but just a part of it, a node that is connected to all the other nodes via an intricate meshwork of lines. We can look at the animals and plants as objects or representation, but we can also regard them as living subjects whose manifestations of life determine (or at least direct) the way humans depict them.

Ecosemiotics is also the closest of the branches of semiotics to ecocriticism, as it deals with the intersections of nature and culture, and how meaning emerges at these encounters. Over the past decades, ecocriticism has widened to study not only literary representations of nature, predominantly nature writing, but also other forms of representation, such as photography, film, commercials, cartoons, etc. As such, ecocriticism is in its many form really a 'criticism', i.e. an analytical practice that not only detects the qualities of the analysed work, but also offers a normative interpretation of it, pointing out its valuable and less valuable contributions to the human–environment relation. As Scott Slovic, among others, has pointed out, it is the duty of literary criticism to bring to the fore the literary works that facilitate human stewardship of the life around us, and that acknowledge our responsibility as humans in preserving the ecological

stability (Slovic 1996: 351ff). In this regard, literature is but one medium among many that shape humans' undestanding of the natural environment on a daily basis. Virtual media and picture-based representations are very powerful vechicles of communication and it is necessary to pay due analytical attention to them as well. However, literature has its own special features that make it a worthwhile subject from ecocritical, as well as from ecosemiotic and also from zoosemiotic points of view.

3.1.3. Zoosemiotics

Zoosemiotics, as defined by its groundlayer Thomas A. Sebeok, is a "discipline, within which the science of signs intersects with ethology, devoted to the scientific study of signalling behaviour in and across animal species" (Sebeok 1990: 35). The focus of zoosemiotic research is on animal communicative systems and on the ways it relates to, and differs from, human language and other modes of symbolic communication. Zoosemiotics is of major relevance for the study of nature writing that represents other animals, be those mammals, birds, or fish. Umwelt as its central notion gives us a research perspective that enables to position humans among other species with their own species-specific ways of perceiving the world around us, as well as with the species-specific ways of influencing one's surroundings, to make them more suitable for the requirements of living. On a daily basis, these requirements of different species get negotiated physically in the environment. At the same time, many body-related abilities and features are similar in humans and other animals, thus creating a common ground for communication, sign exchange, and development of mutually meaningful relations between the representatives of different species.

Sebeok points out that there are two large types of animal communication – intraspecific and interspecific. Whereas cultural ecosemiotics is interested in interspecific communication where one communication partner is human, and ethology deals mostly with intraspecific communication, zoosemiotics does not limit its interest with the representatives of merely one or two species. Universal communication patterns that underlie interspecific communications are sought, and much attention is devoted to the question of coding in communicative behaviour, as well as to the possible types of communication.

About the basic principles of zoosemiotics and its application perspectives in literary criticism, see Maran 2014: 297–311, where he distinguishes between three levels of modelling in a literary text: zoosemiotic, linguistic, and artistic modelling. Whereas literary studies are mostly concerned with the level of artistic modelling that includes the usage of poetic devices, metaphors, stylistics, structuring of the text, etc., biosemiotic criticism proposes that the scope of analysis of nature writing should be wider and also look into the underlying levels of semiotic modelling.

Zoosemiotic modelling is Umwelt-based, and immediate; it embraces the experiencer's bodily sensations of the environment and of the other species. This is a predominantly pre-verbal level of modelling. Linguistic modelling is based on human verbal language. On this level, human language is used to form and formulate the environmental experience. This level may include making use of onomatopoeia, but also of other human sign systems. In written form, this level is accessible to humans only. When read out loud, some onomatopoetic renderings of animal sounds may have an effect of inter-species' communication, i.e., they might elicit a response in the respective species. The third – artistic – level is making use of poetic devices, and is what Lotman and Tartu-Moscow school of semiotics have called "secondary modelling system". Artistic modelling creates its own abstract space that often requires certain cultural competence in order to recognise the tropes, allusions, and other sophisticated literary devices employed in order to create the suitable ambience in a text of nature writing.

Bio-, eco-, and zoosemiotics facilitate our understanding of the world as a communication-based interplay of subjects and agents. The semiosic abilities are not reserved for humans only, but are to a great degree shared with other life forms. Verbal semiosis, characteristic of the human species, deserves to be studied, taking also the other layers of sign processes into account. In order to proceed to the analysis of nature writing from a biosemiotic point of view, it is necessary to clarify the notion of Umwelt that is instrumental in making sense of the representations of other species in nature writing and in human understanding in general.

3.2. Umwelt

Umwelt is a notion that has gained visibility in ecocritical usage in the recent years, much thanks to the writings of authors such as Louise Westling (see her "The Logos of the Living World", 2014), Wendy Wheeler (see her "The Whole Creature", 2006), and others. A concise overview of the current uses of the term in semiotics is provided in a recent article "The biosemiotic glossary project: Umwelt" (Tønnessen, Magnus, Brentari 2016: 129–149).

The notion originates in the work of Jakob von Uexküll, the groundlayer of the semiotic approach in biology. Although Uexküll was not a self-designated semiotician, his thoughts and work has been developed in the direction of biosemiotics by a number of scientists of a much younger generation, such as Jesper Hoffmeyer, Kalevi Kull, Don Favareau and others (see, for example, the special issue of Semiotica 134 (1/4); Kull 2001), his contribution remains unquestionably essential to the biosemiotic project of understanding the role of communication in nature, including the human species. The Umwelt theory, initiated by Jakob von Uexkull (in English, see Uexkull 1982: 25–82) enables us to see all species, including humans, as complex agents with species-specific receptor organs and certain responding capacities that in turn set the behavioural

repertoire for adjusting themselves to the surrounding environment. Uexküll himself proposed the simultaneous processes forming one's Umwelt in a schematic manner, as the functional cycle (Funktionskreis):

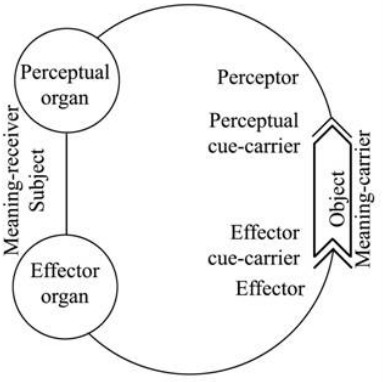

Figure 1. Functional cycle as devised by Jakob von Uexküll (1982: 32).

Here, the subject (an individual organism) is depicted on the left as possessing both perceptual organs and effector organs, by means of which s/he is in a permanent connection with its surroundings. Perceptual organs enable the subject to receive cues and signals from different phenomena outside of him- or herself (in the scheme, termed as 'Object'). After processing the received signals, the subject is able to respond to, in some cases even reshape, the meaning-carrier outside its immediate organism using the effector organs – be these claws, teeth, or in case of humans, sometimes also a complex of organs granting us verbal abilities. The schema demonstrates that reception of and reaction to extra-organismic stimuli forms a seamless cycle.

Two important points that follow from Uexküll's model of the functional cycle could be mentioned here. First, the general rule that perception leads to action via interpretation and decision-making. The signals received from the environmental stimuli are processed within the organism (subject), before any action is taken. In some cases, responses to the received signals may result in no action whatsoever, but also in that case, opting not to use the effect organs is a result of a perception and interpretation. The whole process may happen without conscious reflection, although we as humans are usually aware of much of our environmental relations on the meta-level. Second, the functional cycle demonstrates that each 'self' is created in a continuous interaction with its environment and all the stimuli that the subject is able to extract from it. Thence, the environment and the meaning-based connections a subject has to it determine its subjectivity, as well as the subject's capacity to act upon these stimuli. An organism and its environment are thus fundamentally intertwined into a complex, meaning-based nexus.

In short, we may say that Umwelt, according to Jakob von Uexküll, denotes the species-specific capabilities of an individual of perceiving its environment and of the behavioural repertoire available to it for making adjustments in it. Depending on the disciplinary context from which side the notion has been approached, the emphasis on what are considered the essential qualities of Umwelt may slightly vary. Here, I'd like to highlight three possible ideas that I have observed being in use in contemporary academic discussions.

First, and rather technically, Umwelt is the species-specific way of a living being to react to his/her environment, based on his/her perception of (*Merkorgane*) and influence upon (*Wirkorgane*) the surrounding environment. This is the understanding that is perhaps closest to the initial observations by Uexküll, made in a laboratory for studying physiology of animals. The environmental stimuli, as well as the organismic responses, may well be relatively mechanical, and on the most elementary level, the functional cycle can be explained in terms of physics and chemistry. However, this is never the ultimate level of explanation when it comes to living, sentient beings.

Second, we can speak of Umwelt in phenomenological terms. Then, it embraces the world as known or modelled by an individual organism, and the relations the subject has to the world. These perceptions and relations can be understood as profoundly personal, not only species-driven, but also individual. Under different conditions, two basically same type of experiences may elicit totally different responses. The organs employed in the perception and in the response are, indeed, the same, but the meaning of the process for the individual self may vary drastically at different times. However, such phenomenological differences can be documented in humans, but not so easily in other species, as we do not have access to the self-assessment of other species, but can only observe and draw parallels based on the overlappings known to us in our respective species-specific Umwelten.

Third, and perhaps most importantly, Umwelt, understood semiotically, is the world as it exists in an organism's sign system; it is its semiotic world. A subject is able to react only to the stimuli s/he is able to perceive. The connections of an organism with the world are always based on sign-relations, i.e. the ties that make sense to the subject. At the same time, the subject per se must in some way fit into the existing meshwork of meaning-relations that forms the semiosphere around him/her. That means that the subject's presence in the world is meaningful already because the mutual compatibility is a pre-requisite for creating meaningful ties at all. In short, Umwelt is composed of all the meaning relations in the perception-based and in the action-based functional cycles of an animal.

One step further from the individual Umwelten is the question about the mechanisms that enable access to the Umwelten of other species, and about the ways such contacts can be communicated to others, either in intra- or inter-species' communication. Nature writing is definitely one of such channels for humans. In order to perceive and interpret the presence and action of another

subject, the functional cycles of the perceiver and the perceived must, technically speaking, be interlocking to a degree.

When we speak of inter-species' contacts, it presumes that there must be a certain overlapping in the Umwelten of the given species: their perception organs must be at least partly similar. At the same time, the environment itself must provide a contact zone for the different Umwelten to overlap: there must be at least some common ground, even in the very literal sense, where the species can meet and engage in meaning-relations. In some cases, it is difficult to achieve, as for example in the case of fish who inhabit a different realm, to which humans have an access only by means of some additional equipment, like a fishing rod or an aqualung. And vice versa – fish need water in order to survive and to communicate. The problem is definitely less acute in the case of species who have more similar requirements for and habits of living – nocturnal vs diurnal animals, ground-nesting vs tree-nesting species, etc.

Animals can actively seek to alter the environment or its features in order to make them more suitable for their life needs. Even if the alterations in the environment are minor, they can be perceived as huge by some other species, such as humans. Verbal representations, including nature writing come to play an important role in how such different interest of the species with overlapping Umwelten are perceived, represented, and negotiated. For example, from a purely human point of view, the results of beavers' daily behaviour are nothing but harmful and pointless. But if we take the animal's Umwelt into account, we can see how the damming of ditches is an inevitable part of its *modus operandi* in the environment.

We as humans, especially in our written communication, can not deny our perspective within the limits of the Umwelt of our own species: we always perceive and conceptualise the world around us as the representatives of human species. Literary representation enables us to create possible worlds and to position ourselves as if in other Umwelten, without actually having to shape-shift. This is indeed one of the indisputable strengths of verbal representation. In comparison to photographic representation that inevitably features human gaze that is technologically mediated, nature writing may be able to conceal the human subjectivity by bringing to the fore the features defining the "target species'" Umwelt. We can look at the animals and plants as objects or representation, but we can also regard them as living subjects whose manifestations of life determine (or at least direct) the way humans depict them. A story can be narrated from the point of view of another species, or it can be narrated neutrally, describing the life events of some representatives of other species as if from the point of view of an outsice observer. Employing the point of view of an omniscient narrator is also a possibility. All of these choices have been used in the tradition of nature writing, sometimes even combining them within the limits of one story.

3.2.1. How to read an Umwelt?

Now, we have different possibilities for how to render the animal's perspective in verbal representations – as this way of mediating the environment per se is something alien to species other than humans. One option is to anthropomorphise the animals, to represent them as if talking to each other, argumenting their behaviour, depict them having emotions similar to the ones of humans, such as love, rage, fear, attachment, etc. – i.e., engage in a practice that results in "pathetic fallacy". Such approach can be encountered in children's stories that have been criticised for their low level of sensitivity towards the genuinely species-specific Umwelten.

The other option is to try to explain the animals' behaviour, relying on scientific data about animal ecology, ethology, and zoology. It requires special skill to convert the quantitative data obtained by the methods of hard science into an eloquent story that the readers would be keen to follow until its end. The strength of nature writing relies namely in that kind of practice.

Thomas A. Sebeok (1986: 80–81) has elaborated on the six principal questions that zoosemiotic investigation should pose and use as the guidelines for its research. According to the tripartite division of semiotic relations, outlined by an early semiotician Charles Morris, Sebeok groups his six questions into pragmatic, syntactic, and semantic questions. We may assume that the pragmatic and the syntactic aspects of communication can be observed in other species beyond humans, too. As to the semantic dimension, we are able to conclude, being familiar with human cognitive processes, what the messages *mean* for us as humans, but it is much more difficult to claim something similar about other species, to whose cognitive processes we do not have any meta-level access.

The pragmatic aspects of communication concern the ways "in which the organism gets indications as to how to act with reference to the world in order to satisfy its needs or interests" (Morris 1971: 44). In the biosemiotic context where we expect the communication to happen not only within the limits of one species, but also across the species, the original questions asked by Sebeok can be re-worded to widen their scope, as has been done by Timo Maran (2007a: 36–47). The pragmatic questions concern the following aspects of bio-communication: 1) What are the communication organs of each engaged species like and how can they send and receive signals that are accessible to the other? 2) Is feedback possible, and is it made use of by the participants in the particular communication situation? Which communication channels are used, and do they match? 3) In which respective positions are the Umwelten of the engaged species to each other? Do they overlap, and to what degree? Where is the 'contact zone'? Is contextual information involved in the communication, in addition to the immediate signal itself?

The next group, syntactic questions, addresses the "signs and sign combinations in so far as they are subject to syntactical rules" (Morris 1971: 29), i.e. the possible ways of combining the elements of communication in order to send

and receive adequate messages. Maran re-phrases the respective points in Sebeok's research agenda as follows: 4) What is the repertoire of messages that each partner in communication can forward to the other, and which responses do they require (active or passive)? 5) How are the messages linked to each other, how are they coded, and to what degree is the code accessible and understandable to the other species engaged in the communication? (Maran 2007a: 45). By being able to follow the logic of syntactic assembly of behavioural and communicative activities of another species, it becomes easier to predict what could happen next in a particular communicative situation. It also diminishes the risks of misunderstanding and injury.

The third dimension, the semantic aspect of inter-species' communication, consists of only one possible point of research compared to three points in pragmatic and two in the syntactic dimension. Morris explains semantics as follows: "Semantics deals with the relation of signs to their designata and so to the objects which they may or do denote." (Morris 1971: 35). Maran (2007a: 45) asks in this regard: 6) What do the messages mean for the sender and to the receiver? What is the meaning of the communication partners to each other? On what ecological relation type is the communication based (parasitic, symbiotic, predatory)? As it was briefly discussed above, it is difficult to make valid statements about the semantics in the Umwelten of other species, but we still are able to draw some parallels, based on our own life-world. At the same time, it must be kept in mind that among the six points of research outlined by Sebeok, only one concerns the semantic qualities of communication. The other five points concern the conditions and more "technical" parametres of message exchange, and a number of conclusions can be drawn already on the basis of these. The answers hopefully facilitate our semiotic competence in engagement in ecological relations around us.

This set of research questions, as outlined by Sebeok and elaborated by Maran, has been used in article IV. The overlappings in the Umwelten of a human and a fish facilitate both fishing as an activity and writing of fishing literature as a sub-set of nature writing. It is concluded that when we investigate the respective Umwelten layer by layer, it is possible to get a better understanding of the ways different species model the world around them, and the occasional contacts with other species.

3.2.2. Threshold zones

Jakob von Uexküll in his "Theory of Meaning" (1982) has made a principal differentiation between animals and plants according to their subjective environments. Whereas animals can actively receive impulses from the surrounding environment and also actively respond to them by a variety of actions, the subjective environment of plants is much more restricted. They receive only a limited number of impulses from their surroundings and their responses as a rule do not include active reactions to these impulses. The subjective world of

animals is termed Umwelt by von Uexküll, and he uses the term Wohnhülle for the respective subjective world of plants. This implies that plants are stationary or that they can move away from unfavourable conditions only very slowly, for example by moving their clonal offspring further off by growing their roots in more suitable directions. They can also enter vegetational stages, preserve as roots under ground, or as seeds, waiting for the surrounding conditions to turn favourable again.

When it comes to plants, it is relatively more difficult to narrate a story from a plant's point of view – although it is by no means impossible or unthinkable.[20] The inner world of plants and their life cycles are just different enough from those of vertebrates, including humans, that it is much more difficult to initiate an emotional bond between the depicted plant species and the reader. Perhaps therefore there is much less nature writing dedicated to individual plant species than to individual animal species. The plants' multiplying strategies are rather different from those of humans, as well as their life cycles that may last hundred times longer than the lifecycles of humans. The narrative employing outside observation may not prove dramatic enough to capture human readers.

Kalevi Kull (2009: 8–27) has elaborated on the threshold zones between vegetative, animal and cultural semiosis, pointing out that it is not necessarily a sharp border that divides those three realms, but rather there are *threshold zones*. Referring to Martin Krampen's work, Kull writes that semiosic behaviour is manifested in plants in the form of a functional cycle (Kull 2009: 12). He argues that semiosis does not require a recognition of a sign relation *as* one, as this requirement is fulfilled only in case of self-conscious beings, i.e. humans who are capable of symbolic communication. Kull (2009: 15–16) lists three types of sign relations that are created in the life processes:

1) Vegetative, which is capable of recognition – iconic relations (non-spatial and non-temporal);
2) Animal, capable for association – indexical relations (spatial and non-temporal);
3) Cultural, capable for combination – symbolic relations (spatial and temporal).

The more basic levels of semiosis are always contained in the more complex ones. Humans possess all three levels and use them in their daily lives – perhaps not always self-consciously, but this awareness is definitely achievable.

Kull argues that we can call the sign-relations-based functioning of a plant also behaviour, as it includes inheritance and memory. Even iconic recognition is based on memory (Kull 2009: 20). Transfer from vegetative to animal semiosis happens with the appearance of nerve receptors that enable an organism to make comparisons between the objects. This is a capacity that is lacking in plants. Kull concludes that different levels of semiosis require different types of memory, learning, and capacities of establishing new relations.

[20] For a recent study of plant poetics, cf Rigby (2015: 23–44).

The central example of plant-focussed nature writing (Rebassoo 1975) that is treated in detail in article VI, has been narrated from a scientist's point of view. However, it reveals strong empathy towards plant species, their living conditions and their distribution strategies. The author occasionally puts herself as if to the position of a plant and considers the risks it may endure – such as storms, weed poisoning chemicals, intense trampling by heifers, overgrowing with other species.

Looking at the world from the perspective of plant may prove very refreshing and rewarding. It also provides a good possibility for defamiliarisation,[21] defined by Šklovski as one of the most important features of literary creation. The main purpose of art is to prolongate the process of recognition, in order to promote the apprehension of the objects that are represented in artistic form (Šklovski 1993: 58). The first example that Šklovski gives of defamiliarisation in his chrestomatic article "Art as technique" (alternatively, "Art as device") is a short story "Kholstomer" by Lev Tolstoi where the first person narrator appears to be an old horse. Defamiliarisation helps to shift the automated everyday perception and to see things from a different, unexpected angle.

Nature writing, like all other literary forms and genres, employs this poetic device: it may provide an unusual perspective to species, their life events, and whole ecosystems from a perspective that is deviating from average human perception shaped by our socially conditioned stereotypes and interests. Defamiliarisation helps us to see the world from a new angle and more fully aprehend it.

3.3. Biotranslation

The question of biotranslation is briefly touched upon in article I – but only as a future perspective.[22] The article in question focuses on the representations of waterfowl as perceived in the writer's Umwelt and forwarded to the readers through a culturally tainted prism. The biological adequacy of those representations is discussed, but not conceptualised in terms of translation. As I am convinced that it is an important topic for future consideration, the thread of thought leading to biotranslation is picked up in the following.

Generally, translation is understood as verbal expression in one natural (human) language repeated in another human language. As explained in the

[21] Viktor Šklovski started elaborating on the notion of 'ostranenie' already in his early writings, such as "Resurrection of the Word" (1914): automated everyday language needs to be deconstructed in order to resurrect the variety of meanings that are implicitly present in all words, to "produce wood-shavings as the plane of thought glides along the surface of language" (Šklovski 2012: 50; my non-verbatim interpretation – K.T.).

[22] I have recently elaborated on the question of biotranslation, using Bengt Berg's bird stories and films as sample material, in a couple of conference presentations and in an article that is submitted for publishing.

following, the notion of 'translation' is used in a wider meaning in the current discussion.

A renown Estonian zoosemiotician Aleksei Turovski has recently stated:

> The most important task, a challenge, if you will, of zoosemiotic research (especially of its applied branch), is translating, the problem of translation. It is necessary to strive for a real understanding of the behaviour of other animals, not just remain interpreting the peculiarities of other species in a human-centered way. The task is to find adequate means, instruments for translating the semiotic systems of animals into the human verbal language. It is a very complicated task. (Velmezova, Kull 2016: 203; my translation – K.T.)

3.3.1. Translation requirements

First, the question of the relationship between translation and other transformative practices that have been discussed in the previous chapters arises in the context of the present study. If an author observes some semiotic processes in the nature, and subsequently writes about her/his observations, is it rather representing, modelling, or translating? As it has been argued above, both representation and modelling are Umwelt-based activities where each species picks the features from environment that are functional, and therefore significant to them, in order to be able to embrace the complexity of the world. In case of humans, Umwelt-based modelling is complemented with language-based modelling. This, in turn, may find its realisation in the form of literature, such as nature writing, or in any other form of art that is based on secondary modelling systems, as termed by Tartu-Moscow shool of semiotics. Literature uses language as its material to represent the world just as we are able to capture and perceive it from within our human Umwelt. Representation is here understood primarily as belonging to the realm of verbal-language-based modelling activities, i.e. literature. A literary model necessarily contains representations.

At the same time, even as we speak about models in general, the question of translation arises. It is important from the outset to distinguish between translation proper, as we generally understand it, i.e. translation from one human verbal language to another, and translation in a wider (or even metaphorical) sense, as transmission of signs from one sign system to another sign system, where none of them necessarily has to be verbal.

Ladislav Tondl (2000: 83) states that a good model must translate back to reality with adequate results, such as a musical score to a piece of music; blueprint to a house; or a map to a specific location. In translation studies, the requirement of the possibility of creating an adequate translation back to the original is one of the basic criteria for evaluating a literary translation. Tondl indicates that in this aspect, model and translation are alike. The same idea is expressed by Timo Maran (2013: 833): the information that we acquire on the basis of a model (such as a piece of nature writing or as an interpretation of nature writing) should be in turn applicable to the modelled object(s); the "ends

should meet" so that we recognise an object based on its model, and a model, based on its object. This idea is very close to the requirement of "reversible translation" used in translation studies.

The general criteria of translation are the following:

- Translation requires two distinct sign systems, and a succesful transmission of meaning from one to the other (copying does not require recognition and is thus not translation).
- Both form and content must be translated.
- The source text and the target text must share functional similarity in communicative situations.
- Successful translation is indicated when transmitted signs continue to function in the target context; feedback of their recognition is received. (Kull, Torop 2003: 319–320.)

Those general requirements are valid also when we ask about biotranslation. Before proceeding to the notion itself as outlined by Kull and Torop (2003: 315–328), let us first deal briefly with translation in general, with its techncal requirements and processual peculiarities.[23]

Roman Jakobson (2010: 300) has distinguished between three basic types of translation: 1) intralingual translation – an interpretation of verbal signs by paraphrasing them in the same language, using different words; 2) interlingual translation or translation proper when verbal signs are transposed to another human verbal language; 3) intersemiotic translation or transmutation when verbal signs are interpreted by means of signs in non-verbal sign systems.

Translation theorist Dinda Gorlee writes that Jakobson derived his ideas about translation from the writings of Charles Sanders Peirce who, in turn, "characteristically used "translation" and related terms in a very broad sense. For him, translation is the same as sign interpretation, and sign interpretation is translation" (Gorlee 1994: 153). In Jakobson's regard, verbal sign systems are primary in all cases of translation, and in the case of intersemiotic translation, the direction of translation is necessarily from verbal to non-verbal. By adding the Sebeokian zoosemiotic layer to the primary and secondary modelling systems *sensu* Tartu-Moscow school of semiotics, it becomes possible to consider intersemiotic translation more than uni-directionally. It can also be a translation from visual or auditive to verbal sign system, or even from another species' sign system to a human one. If we do not confine ourselves to the exclusively human sign systems, the notion of intersemiotic translation may yield much more interesting possibilities and research results, and nature writing provides much appreciated material for such studies. Peeter Torop (2011: 166) writes about

[23] There are several nuances to verbal translation that are not discussed in depth here, as our interest lies in the cases where at least one of the sign systems involved in the translation process is non-verbal or even of non-human origin. Translation proper has been thorughly studied, e.g. in Sütiste 2009; Torop 2011.

radical translation semiotics that deals with cases where the discrepancy between the sign systems of the original and the target text is too big for making a translation in a classical sense. Regardless to such situations, information is mediated by creating a song about a painting, or a ballet based on a novel – or, by writing a piece of nature writing about a representative of a non-human species, for that matter. The punctuality and intelligibility of such translations can not be defined precisely, but namely such instances can be conceptualised as radical translations, and studied by help of radical translation semiotics.

Biotranslation, in short, can be conceptualised as radical intersemiotic translation between Umwelten. We can speak of biotranslation as the Umwelt of one speceis mediated to human readers in the form of literature, a communication type accessible only to the members of our species.

In addition, there is also the situation of zero translation, or significant absence of a translation in culture. This case is discussed in the final part of the present introductory chapter, in association with the need for comparative research in the study of nature writing. It turns out that there are several significant cases of zero translation in the history of Estonian nature writing that require further analysis. Zero translation may occur also in case of biotranslation – for example, if a species that lives side by side with humans has received no verbal representation whatsoever. Those hypothetical cases of zero translation must remain the object of one of the future studies.

What we can say is that in nature writing, we can detect all three types of translation as outlined by Jakobson. There is intra-lingual paraphrasing, there are interlinguistic translations (e.g. latin names of species explained in the native language of the author), and intersemiotic translation in the form of combination of textual and pictorial information, or in the form of representing different Umwelten in one text. By demonstrating the presence of the three different translations in the texts of nature writing, the complex nature of the semiotic mechanisms is revealed that we as humans use in order to create a comprehensive representation of our environment and our fellow species.

In relation to interlingual translation, Jakobson (2010: 301) discusses the problem of equivalence versus adequacy, and comes to the conclusion that equivalence between a translation and its original is virtually impossible to achieve, but if the translation functions in its target culture similar to the original in its cultural context, it may be considered successful. The burden of translation, according to Jakobson, is on the message: if the message comes through, the purpose of the translation has been fulfilled. Kull and Torop (2003: 326) express agreement with this opinion: “equivalence in translating must be obtained not between words or grammatical constructions, but, rather, between the functions of texts in communicative situations.” Gorlee (1994: 20) points out, referring to Gideon Toury, that even verbal texts may have more than one semiotic border to cross in the process of translation. We could even say that an interlinguistic translation always also embraces some non-verbal implications or contexts, so that it is difficult to distinguish between a purely linguistic

translation from an intersemiotic one. At the same time, it supports the argument for biotranslation as a legitimate part of translation as such.

The authors of the "Theses on the semiotic study of culture" claim that even within a single culture or tradition, the possibility of translation is constantly negotiated: "In this process, so long as equivalence is not identity, translation from one system of text to another always includes a certain element of untranslatability" (Lotman et al 2013: 73). The same idea is supported by Margherita de Michiel who has elaborated her translation theory, based on the works of Mikhail Bakhtin. She argues that two different sign systems may well be translatable, that is deciphered and transferred from one system to another and vice versa, but it is not possible to translate an integrate text as a whole in an exhaustive manner (de Michiel 1999: 691; cf Bahtin 1987: 215). The idea that any text contains a certain degree of untranslatability leads us back to the very general communication-related question of overlapping Umwelten and the possibility of feedback across Umwelten. Possibly there are fine qualitative nuances that determine whether the participants in a communication (or, in a translation) process consider the exhange successful or not. Those nuances might be hard to grasp, and they need to be assessed individually in each particular case. Most likely it is not possible to develop a universal model of "untranslatability", and this is not the aim of the present work. Rather, the questions of translatability and feedback are important when we regard nature writing as biotranslation.

3.3.2. Translation between Umwelten

In translating a piece of nature writing from one human language to another, it is not only the verbal form of a text that has to be translated. Also natural history information, the words, both scientific terms and vernacular expressions describing the environment and other species, and most importantly, the Umwelt of the depicted animal(s) must be translated. This widens the question of translating to Umwelt-studies. Initially, for a contact to occur, the Umwelten of the species must overlap at some point, at least. Timo Maran has conceptualised this as biocommunication (Maran 2008: 67). If the sign process actively involves only the receiver, with an intentional sender missing, this situation can be distinguished from communication proper and termed signification (Martinelli 2007: 28). In the same manner, if the receiver's activity is inhibited, the result is copying, another special case of sign transmission (Kull, Torop 2003: 321). In order for communication to appear, that overlapping must enable sign exchange between the representatives of the engaged species. The question becomes more complicated when the encounter has been rendered in any human-specific sign system – in our case, in written word. Does it enable "reversible translation" of any type? If human behaviour affecting the represented environment and/or species is altered so that it has an effect on their

actual quality of life, after reading a piece of nature writing, would that count as a successful translation back to the reality?

Kull and Torop claim in their jointly written programmatic article "Biotranslation: Translation between *Umwelten*" that successful biotranslation is signalled by information transmission and feedback recognition (Kull, Torop 2003: 319). How to measure those features in case of nature writing, if we want to regard it as biotranslation? In order to find answers to these, indeed complicated questions, we need to delve into the idea of biotranslation as applicable to nature writing. In their article, examples of biotranslation are drawn from the realm of genetics, DNA replication, and from the molecular levels of life. It is tempting to test whether this notion has explanatory power also on the higher organisation levels of life.

One of the innovative ideas that their article presents is bringing the *translator* as an organism to the fore when thinking about the components of a successful translation (Kull, Torop 2003: 317, 320). This is linked to the idea of translation between Umwelten, as well as to the the notion of model: "the understanding of *Umwelt* as the acting of the individual sign system does not contradict the understanding of *Umwelt* as a *model* of the world (Sebeok 2001), since any natural and working sign system can be seen as a certain model of the world." (Kull, Torop 2003: 318). Hence, the translating subject with his/her way of modelling the world is brought to the core of the notion of translation. This proposal somewhat deviates from the Tartu-Moscow school's structuralist understanding of translation where *text* is primary object of interest. For nature writing, the idea of biotranslation is definitely suitable, because in the analysis of such texts we must take into account the subjective Umwelten of the author, of the reader, and of the individuals of all species that are represented in the text. The question of translation is not only language- or text-based, but it also has its subjective level.

Translation requires two distinguishable sign systems, and a successful transmission of meaning from one to the other (Kull, Torop 2003: 320). Biotranslation could be regarded as transmission of meanings between Umwelten. In case of a regular translation, we can speak of the structure of the text, its poetic function, of the syntax as one of its constituting values. It is a commonly accepted idea that the communication systems of other animals besides humans do not possess syntactical devices, such as conjunctions, and cannot thus be considered syntax-based. Timo Maran (2008: 69) writes that lack of syntax in biocommunicative systems reduces them to a conglomeration of discrete sign entities that relate to particular objects, phenomena or characteristics. He assures, however, that even such non-syntactically organised sign communities can be systematically analysed, based on the main principles that organise the existence of any living being. Kull and Torop (2003: 319, 326) suggest that animals' behaviour is subjected to very clearly causal and sequential order, certain rythmically repeated life patterns, that may serve as pro-syntax. Thus, translation of an animal's life events into a human narrative emerges as a technical, as well as semiotic problem.

The connecting point that ties together humans' and other animals' Umwelten is indeed the life cycle: each individual is born (or hatched), it matures, moves about, mates, gets some offspring, and finally dies. All of these stages of life are observable in most of the vertebrates, thus providing nice common ground to draw affective parallels between the lives of different species. The kinship ties and life cycle are universally present and universally understandable across species. This also provides a "natural" structural basis for nature writing featuring animals and animal lives. Thus we can say that animal representations based on a featured animal's life cycle are relatively easily accessible to human readers who can find similarities with their own Umwelt. This fosters sympathy towards other species that is also one of the aims of nature writing, in addition to giving information about and insights into our fellow species' lives, as they might see it themselves.

Understanding biotranslation on an individual's level as an *en gros* message transfer between Umwelten is also supported by the idea that in particular instances, "translation can be successful not on the level of single signs, but on the level of a whole text", i.e. on the general semantic plane (Kull, Torop 2003: 320). This idea also supports the claim that biotranslation is possible even if the syntactic planes of the original and the target text are not compatible due to their different levels of complexity. The lack of syntactic organisation in other-than-human communication systems does not automatically bar translation; the meaning of a text can be identified based on the context, or on the deep structure of it (Kull, Torop 2003: 325).

When we think of examples of biotranslation, animal stories prove perhaps the most easily graspable source material.

Torop (2000: 72) writes that intersemiotic translation can be either autonomous, such as a screen adaptation of a novel, or complementary, such as a photograph accompanying an article. In case of biotranslation, this division brings about several questions. If we think of a piece of nature writing as a translation of a natural ecosystem and the species (including humans) who live there, it can be conceptualised both as an autonomous text that can be read and understood even without knowing the actual references in the reality; and as a complementary text that relies on the actual environment. The model of nature-text that has been discussed above, seems to suggest the second option: nature text is never an autonomous entity, but it is inescapably conneced to and influencing the environment, based on what it has been written. Nature writing is complementary to nature, never independent of it.

A good example of biotranslation that has translated back to nature in the form of efficient nature protection agenda is the work of Bengt Berg (1885–1967), a Swedish naturalist. Berg was one of the earliest photographers and filmmakers who dedicated his entire work to representing nature. He is best remembered for his nature documentaries of the 1920s that used remarkably advanced filming techniques in order to render a truthful picture of the Umwelten of the species that were in the focus of his film projects. For example, in order to represent the spiralling flight of a white-tailed eagle, he mimicked it in a light

aeroplane that flew in the same spiralling manner. The whole process of filming, together with all the troubles that the pilot and the camera man had to face, is accounted in his book "De sista örnarna" (*The Last Eagles*; book 1923; film 1929; translation into Estonian "Viimased kotkad" 1972, by Henrik Sepamaa) and "Örnar" (*Eagles*, 1960). Berg's popularising work in the form of nature writing and nature documentary resulted in an alteration of the Swedish hunting laws so that the population of white-tailed eagles was able to recover.

In Berg's case, we can differentiate between three types of translation: first, linguistic translation, or a translation of a Swedish text into Estonian. Second, the books feature intersemiotic translation in combining verbal text and photographs and/or film stills that are mutually complementary. Third, we can speak of biotranslation, as the Umwelt of eagles is mediated to human readers in the form of literature, a communication type accessible only to human species.

On one hand, Berg managed to translate different aspects of eagles' life into human sign systems in a reliable and capturing manner. On the level of vocabulary, it includes onomatopoetic descriptions of the sounds of eagles and other birds. On the level of sequencing of the story, it follows faithfully the life cycle of an eagle from its growing up to nesting and parenting. Humans generally share a similar life course – from adolescence to maturing, establishing a family, raising children, and finally, old age and death. In that regard, the life of an eagle and of a human are well compatible and syntactically similar. Berg in his stories definitely took an advantage of this parallel. As a result of these capturing stories from the Umwelt of eagles, the attitudes and behaviour of Berg's audience were changed, and it eventually translated back to the real nature as an alteration in human behaviour in respect to birds of prey. The eagles themselves evidently do not have any access whatsoever to printed books or nature documentaries, but they were positively influenced by the altered human behaviour in the environment that they share with other species.

Thus, we can conclude that nature writing can be considered as biotranslation. At the same time, I would like to point out a recent remark by philologist Marju Lepajõe that translations offer a chance for a dialogue, but they can never replace the original.[24] This is true also when it comes to nature writing: it may offer us captivating translations of the natural world, but it can not replace it.

3.4. Connecting disciplines

Nature writing is a complex phenomenon that requires efforts originating from different disciplines in order to be analysed in its full detail. Even if we regard nature writing as primarily belonging to the realm of literary studies, a glance from other disciplines helps to bring to the fore some dimensions of it that would remain unnoticed from a purely literature-centered perspective. Even recently,

[24] http://kjt.ee/2017/02/lugejaintervjuu-marju-lepajoega/

discussions have been held, whether ecocriticism needs (a common) theory at all (see Lioi 2010: 754–799). With the idea of environmental humanities gaining foot, the questions about transdisciplinarity and cross-disciplines' cooperation have become urgent (see Bergthaller et al 2014: 261–276). The calls for joint research efforts have been often led by scholars of environmental history (such as William Cronon, for example), a discipline that has considerable common ground with ecocriticism. In the current work, articles V and VI make use of transdisciplinary research where the knowledge and methodology of scholars from different disciplines is brought together to produce qualitatively new knowledge. At the same time, several practical and theoretical questions arise: How to co-operate acorss disciplinary borders in a most resultative way? What are the challenges, obstacles and gains of such efforts? What are the possible restrictions for transdisciplinary research, be it institution- or content-wise? In the following, those questions are pondered, using both practical examples and theoretical discussions.

3.4.1. Ecocritical practice

Nature writing has been the primary field of interest for ecocriticism, although it has over the time caught the attention of ecologists, environmental historians, and semioticians who see the great research potential present in this once marginal field of literary creation. According to Cheryll Glotfelty (1996: xxii–xxiv), ecocriticism has developed in three waves, much like the ones that have occurred in feminist literary studies. These waves or trends do not follow each other sequentially, but as the principles guiding ecocritical research, they are distinguishable from each other.

First, the canon-builiding activity emerges together with the initial interest towards nature writing as such. In North American literary context, the building of the canon of nature writing began with Henry David Thoreau's work, and also of his contemporaries, focusing on early settler naturalists and later to farming literature (see Buell 1995: 339ff). In Estonian context, nature writing in German, written by the local Baltic German literati, stretches back to the 17th century (see Plath 2011b: 698–715; Plath 2008: 113–122). This, indeed a very interesting body of material, has remained beyond the scope of the present study, but it definitely desrves to be brought out of the oblivion for ecocritical research in the future. The tradition of nature writing in Estonian language has emerged and formed gradually, existing on the margins of Estonian literature and popular science literature for the past 150 years or so. The conscious act of outlining the canon of Estonian nature writing was first made in the master's thesis of the author of the present work. It has been followed by several articles refining the selection and selection principles, written jointly with Timo Maran (cf Maran, Tüür 2001: 4–10; Tüür, Maran 2005: 237–270; Maran, Tüür 2017: 286–300). This kind of work can be characterised as writing literary history, or at least widening the historical perspective of literary studies.

The second direction in ecocritical resesarch is re-reading classical texts of literature for the nature imagery, the tropes employed, and the overall attitudes towards nature that can be revealed in a piece of literature by the help of tools available for literary analysis. In Estonia, the idea of looking at the nature imagery in our classic works of literature has been growing as a trend (cf Soovik 2002: 499–510; Kepp 2011: 35–52; Talivee 2016: 1000–1006).

The third wave or trend in ecocritical studies is theory development. In some cases, the tools available to a literary scholar are not enough to extract all the important aspects related to literary representations of nature from the texts of nature writing. Knowledge of natural history, biology, and history in general are necessary in order to understand why nature has been represented in certain ways in literary creation. However, each discipline has its own research methods in addition to the factual knowledge that it embraces. In interdisciplinary research, this may often prove a challenge to combine knowledge derived from different methodological approaches into a coherent whole. Therefore, theory development is necessary. This means searching for a common approach as well as for a common meta-language that would enable to speak about literary creation and about nature with common terms. For example, an early pioneer of ecocriticism, Joseph W. Meeker in his seminal "The Comedy of Survival" (see Meeker 1997) combines animal ecology and comparative literature with a highly amusing and insightful effect. Glen A. Love argues for interdisciplinary competence in literary studies and in ecology in his "Practical Ecocriticism" (Love 2003).

When we look at recent work in European ecocriticism (Goodbody, Rigby 2011), we can see ecocritical research being blended with philosophy, ethics, asethetics, materialism, marxism, memory studies, but also with ecology, religion studies, social systems theory, and even postmodernist theory. The bio-semiotic approach is advocated in the conclusive essay of the collection "Eco-critical Theory: New European Approaches" by Wendy Wheeler (2011: 270–282), signalling of the growing interest in semiotics from behalf of European ecocritics.

Meanwhile in North America: ISLE, the oldest journal of ecocriticism in the world, publishes a "Special forum on ecocriticism and theory" (Lioi 2010: 754–799), bringing together a motley array of statements from sixteen scholars of ecocriticism from diverse cultural backgrounds. Some of the neighbouring disciplines that are proposed as fruitful for cooperation in the responses include geography, ecology, evolution theory, science in general, environmental history, philosophy, ethics, cultural studies; of various less insitutionalised approaches get mentioned deep ecology, ecofeminism, marxism, affect theory, postcolonial theory, and Russian Formalism. Majority of the scholars in the forum tend to express only moderate interest in the development of a common meta-language or a common methodology for ecocriticism. Vice versa, it is seen as setting limits to academic – and also political – freedom. A Singapore scholar Klyth Soo-Hong Tan quotes Scott Slovic who envisions globalised ecocriticism as a network of "no single, dominant worldview" and "no central, dominant doctrine or theoretical apparatus" where ad-hoc practice helps to redefine the field on a

daily basis (Tan 2010: 790). Tan welcomes this standpoint, as he believes that ecocritical analyses should not be explicitly tied to "green moral and political agenda" that would produce a "totalizing sort of green theoretical discourse" (Tan 2010: 791). It is indeed true that each theory relies on some, implicit or explicit, political premises, but I think that a search for a common methodological platform should not be rejected altogether for just this reason – that would be, as the saying goes, throwing the baby out with the bathwater.

Philosopher Robert Wess (2010: 764) is looking for new theoretical possibilities in his response: "But ecocriticism's subject goes beyond culture and, therefore, beyond constructionism's theoretical capabilities." The present work attempts to argue that there are possibilities of going beyond the limits of culture and still remain theoretical, for example, by using biosemiotic methodology.

There is also argument for interdisciplinarity. One of the respondents, Jim Warren, writes that "ecocriticism is strongest when it is most interdisciplinary. [---] Fundamentally, the interdisciplinary focus suggests that new ways of knowing can emerge from disciplinary crossings." (Warren 2010: 771–772). Historically, ecology, natural history, geography and exploration history, as well as deep ecology as a philosophical approach have had considerable application in Anglo-American ecocriticism. In Estonian research of nature writing, the cross-pollination of ecocriticism with semiotics has proved most rewarding so far. New perspecties are opened up by combining ecocriticism and environmental history; ecocriticism and geocriticism.

3.4.2. Inter- and transdisciplinarity

In the present work, an ecocritical analysis of nature writing is combined with semiotics in an interdisciplinary manner. This choice can be said to be rather "natural", as semiotics has its roots in linguistics that has in earlier times firmly belonged together with literary studies under the aegis of philology. Tartu-Moscow school of semiotics departs from the idea that "the essence of culture is semiotic by its very nature, since its foundation is information and communication" (Salupere, Torop 2013: 32). Semiotics in general deals with the mechanisms of meaning generation, and it has traditionally focussed on the meaning generation in human culture: primarily in human verbal language, but also in other human cultural activities, such as theatre, film, art, and music. Biosemiotics that has emerged throughout the 20th century and reached its widely acknowledged position by the 21th century, has been unique in the demonstration that sign processes are present not only in human culture, but also in animal behaviour, and in all the living systems. All life is based on the exchange of signs; recognition and interpretation by living systems forms the basis of communication that is necessary for living entities to survive. Communication is understood here in a broad sense, not as merely verbal comunication, but as any exchange of signs that results in interpretation. Semiotics facilitates our understanding of communication processes in nature and in human culture,

using the same terms, methods, and meta-language. This can be considered a strength that many other theory combinations do not have, as they have to look for a common meta-language from the scrath, but in semiotics this common ground is implicitly present from the very beginning. As Salupere and Torop note (2013: 19–20), semiotics constantly strives towards more flexible languages of description and more clearly articulated methodological principles. The present work hopes to contribute to this ongoing process.

In his discussion of intersemiotic translation, Torop (2000: 96) concludes that semiotic approach enables to study a text on the plane of verbal expression, as well as on the plane of non-verbal information. Nature writing as an inherently hybrid text that embraces both natural and cultural dimensions is therefore an outstandingly suitable material for semiotics.

In applying semiotics to the study of nature writing, the advantages that can be hoped for, are the following:

- The content of the texts can be analysed using the same analytical tools that help to unravel the form;
- The metalanguage embraces both natural and textual processes;
- Instead of combining different theoretical traditions to study a complex object, one theory is applicable to a wide variety of aspects that object – i.e. nature writing – has.

As semiotics is able to deal with and conceptualise a diverse array of sign systems, using coherent metalanguage that is applicable to any sign systems and any of their different levels, it can be considered a meta-discipline. Meta-discipline is understood here, according to Torop (2011: 17) as a discipline that unites others and creates a common working meta-language. In early structuralist semiotics, linguistics served as a meta-discipline.

Torop (2011: 17) mentions also other types of disciplinarity. In contrast to meta-disciplinarity, he proposes de-disciplinarity as a designation of ad-hoc research praxis where the object itself determines, which methodology could be applied in its study. As contemporary cultural objects are very complex, one discipline is not able to give an exhaustive description of it, and therefore different apporaches are allowed in its study. He also lists three dangers that such lassez-faire apporach may create: 1) the heterogeneity of disciplines; 2) fragmented terminology; 3) methodological uprootedness (Torop 2011: 16). Sverker Sörlin (2012: 789) adds the notion of multidisciplinarity to this list, referring to the joint efforts of humanities scholars in establishing the new field of environmental humanities.

In the case of interdisciplinarity, integrated knowledge is based on the common ground that connects individual disciplines, or interference, as Torop (2011: 18) calls it. Generally it is assumed that one researcher should obtain a basic level of knowledge in at least two disciplines that s/he sees necessary to combine in his/her work. In ecocritical study of nature writing, literary studies and ecology are the two most commonly juxtaposed fields. However, in reality

we do not find people with academic training in both fields too often (Joseph Meeker being an outstanding exception). This means that truly interdisciplinary research is a challenging excercise. Often, one person's expertise in several different fields is not sufficient in order to produce results and conclusions that would be convincing to the scholars within the disciplinary boundaries of one research field. Or, if methodologically all is clear, but it is applied mechanically, without a deeper understanding of the object, it brings no new results. That has somewhat brought down the reputation of interdisciplinarity.

An alternative to interdisciplinarity that has been promoted recently is transdisciplinarity. In that case, scholars of different fields group together in order to solve problems that touch upon their respective fields, but that are too wide to be addressed from only a disciplinary point of view. Marine history, exploitation of marine ecosystems and fisheries research is one of such topics where transdisciplinary approach has proven especially fruitful (see, for example, "Alien Ocean", Helmreich 2009, that combines anthropological research and marine biology). Torop (2011: 18–19) explains that transdisciplinarity should aim at creating a complementary synthesising frame for a common research project. All researchers retain their disciplinary identity, and a need may arise to strenghten it as the project advances. Referring to Jürgen Mittelstrass, he also claims that a transdisciplinary approach eliminates isolation on a higher methodological plane, but does not dissolve research areas or disciplines. It is first and foremost a practical approach to problem-solving, not so much a research method.

Salupere and Torop point out that transdisciplinarity is inherent in the semiotics of culture as developed by Tartu-Moscow school of semiotics: the search for new ways of the description of culture is based on combining different approaches, disciplines, and meta-languages. For the same reason, a diversity of metalanguages is accepted in the semiotic study of culture. (Salupere, Torop 2013: 34.) The present attempt to combine the meta-languages of ecocriticism, semiotics and a number of other diciplines, also stems from this promise.

3.4.3. Towards environmental humanities

In a neatly written survey of disciplinary discourse, a professor of education Tony Becher (1987: 261–274) has outlined obstacles that may occur if researchers from different disciplines want to embark on a common project. First, the most obvious and most crucial thing – terminology and meta-language. Even if the concepts may sound alike, they do not necessarily have the same scope for scholars from different fields. Also, academic traditions and the accumulated tacit knowledge within a given discipline are not quickly and easily learnt. Each academic field has its own unwritten rules and peculiarities. Becher (1987: 263ff) points out that even the words that are used for evaluating one's colleagues' works, differ according to the academic background of the evaluators. In the formal scholarly communication, several technical details and

variables have to be taken into account, such as: 1) whether it is common to publish as a group of authors, or individually; 2) how long should a standard article be; 3) is it common to use tools of quantitative analysis, such as graphs and tables for presenting the results; 4) how long should the list of sources be; 5) how should the references be motivated in the text; 6) which personal pronouns are correct to use in an article; 7) in which sequence should the arguments be presented; 8) which proof is needed to verify one's claims; 9) does the researcher distance oneself from the study object (by means of quantitative methods) or is certain intimate approach needed (qualitative methods). He concludes that the hardest part in collaborative research is "the need for the excercise of interpretative skills" (Becher 1987: 237).

In the contemporary world where "anthropocene", "climate change" and "environmental migration" are the key words not only in academic debates but also in current media news, such concerns need to be left behind. Historically, environment has been considered as the "area of responsibility" of natural sciences. As a Swedish environmental historian Sverker Sörlin saliently puts it, "Our belief that science alone could deliver us from the planetary quagmire is long dead" (Sörlin 2012: 788). He argues that by application of the term "anthropocene", humanitarians would also get access to "serious" study of environmental problems, as these really are no more nature's problems than they are humankind's. "Hard" science lacks the means for handling the "soft" aspects of environmental change, and that is where the joint efforts of environmental humanities are needed. Sörlin writes:

> We cannot dream of sustainability unless we start to pay more attention to the human agents of the planetary pressure that environmental experts are masters at measuring but that they seem unable to prevent. (Sörlin 2012: 788).

The environmental problems that we as humanity currently face can only be solved in the joint efforts of scientists and humanitarians. Environment inevitably has a social dimension, and the stories that we tell about our lives and resources have to be critically studied in order to create a sustainable future. One problem that may occur is that of incompatible scales: more than often humanitarians and scientists work on very different time scales. What looks like a major cultural shift is perhaps just a tiny irregularity when placed on an evolutionary scale. Even anthropocene may occur as just a minor statistical deviation on the global geological scale, but it is affecting real people in our times. The same is true about different spatial scopes. It is not easy to project such seemingly incommensurable scales onto each other, but the idea originating in cultural semiotics, isomorphism of all levels of a text (if we regard global, "long history" as a text) gives some hope that it might be possible. In Estonian, I have discussed these possibilities in a recent article in a special issue of "Vikerkaar" devoted to anthropocene (Tüür 2016: 71–80). We must admit that transdisciplinarity in the framework of environmental humanities is a promising perspective, but as the present thesis, among numerous other such

endeavours demonstrates, it is still much more a work in progress rather than a consumer-proof solution.

The participants in the round table on the perspectives of environmental humanities (Bertghaller et al 2014: 263) point out that ritual referring to interdisciplinarity is of no use. True transdisciplinarity embracing not only different disciplines, but also non-academic audiences, NGOs and laypeople should advance step by step, starting with consolidation of the disciplines that are already close to each other, such as ecocriticism and environmental history that both deal with texts and ask for the creation mechanisms and historical significance of their written sources (Bergthaller et al 2014: 269). One step further would be to engage in multispecies ethnography (as eloquently described in Kirksey, Helmreich 2010: 545–576) that takes into account the perspectives of other species, and of the hybrid environments that we create together.

One important idea that Bergthaller et al (2014: 264ff) throw into the air is that of slow scholarship: it should take time for discussions across the borders of disciplines, and also for communication with wider public. In humanities, the knowledge is cumulative, not revolutionary; therefore it is not necessary to publish one's findings faster than others. Writing and publishing are also forms of thinking that can not be sped up by means of "outside" instruments, such as research funding or a number of published articles as an indicator of scholarly excellence.

The authors suggest that cooperation should start from bordering disciplines, and the border areas need to be mapped first: where are the disciplinary borders easy to cross, and where do the ideas and people get stuck? What are the reasons – different terminology, methods, the scope of meaning of particular terms? Can terms and methods of different disciplines be negotiated to become compatible, so that they could be commonly used? How to agree on a meta-language that all the involved research groups would agree to use? This requires some substantial work before common research questions can be posed and before everyone can embark on the work, but it is definitely worthwhile trying. Discussing the premises of joint research is time-consuming indeed, but they increase the chances that eventually everyone agrees on a common interpretation of both the means and the results of a jointly carried out study. Disagreements commonly result from poor communication.

One great example of current transdisciplinary cooperation is the Icelandic research project IEM, "Inscribing Environmental Memory in Icelandic Sagas".[25] This project brings toghether historians, literary scholars, archaeologists, geographers, and biologists who are grouped into four thematic work groups: 1) digital resources (GIS, data management and analysis, maps, etc); 2) textual analysis via ecocriticism and environmental history (both historical documents and sagas, but also folklore); 3) historical ecology, historical climatology and comparative human ecodynamics (zooarchaeology, geophysics, etc.);

[25] See http://ihopenet.org/circumpolarnetworks/ for more detailed information.

4) integrated science and humanistic study (developing of new joint methodologies, but also looking for new funding sources). They study embraces a time span of 1000 years, from the arrival of the Vikings to Iceland until the end of the Little Ice age. The project examines changing human-landscape-climate interactions in Iceland through time. The heads of the projects describe their research focus as follows:

> Just how known processes of environmental change and adaptation may have shaped medieval Icelandic sagas and their socio-environmental preoccupations is of great interest, yet just as interesting are other questions concerning how these sagas may in turn have shaped understandings of the past, cultural foundation narratives, environmental lore, local ecological knowledge etc. (Hartman, McGovern 2014: 9).

In the case of transdisciplinarity, the crucial point is wording the common research question. This has to be done in the manner that makes sense to the representatives of each separate discipline, in clear language, using the terms that have shared meaning and are commonly understood by all the parties involved. If the research question has been posed in a way that facilitates joint efforts and sharing of the research outcome with each other, the potential of transdisciplinarity is great.

Indeed, here, too, the question of common meta-language remains, just as is the case with interdisciplinary research. In case of transdisciplinary research, each co-author is responsible for using one's discipline's terms and methods, but these have to be discussed beforehand with one's fellow researchers and explicated in the final publication. This requires an additional effort, and sometimes even longer negotiations, because a) same terms may have a different coverage in different disciplines; b) same phenomenon may be described with different terms in different disciplines, and it may be hard to decide, whose term is to be used when the research is jointly presented to the public. It is also a question of rhetoric power and influence, one of public visibility and popularisation.

Transdisciplinary research requires, just as any other joint effort, a lot of mutual trust from behalf of the involved parties – both as individual scholars and as institutions. In my own experience, transdisciplinary research works best with people who have long-term personal relationship and mutually recognised and understood scholarly interests. It is better if institutional concerns (including the questions of covering the research costs) are left out of the joint research project. Transdisciplinary work should primarily be dialogic.

In the context of social sciences and environmental history, transdisciplinarity has been regarded as the contemporary requirement of academia to reach out to wider public, including digital communities, informal education, enterprises, and NGOs. This is an enlarged notion of transdisciplinarity. In the framework of the present thesis, Appendix 2 documents one such attempt where academic research, skills in bibliography, exhibition making, informal education

and lifelong learning came together. The resulting book exhibition featuring the best of Estonian nature writing was successful and the group who worked together in the preparation ran smoothly. Ideally, transdisciplinary cooperation should strengthen the mutual understanding of the practicioners and theorists. The goal of reaching out from the academic ebony tower is definitely worthwhile trying. In case of a thesis written in a foreign language, the outreach may start only with the publication of the research results in one's native language, Estonian. This stage of transdisciplinarity is beyond the scope of the present work, but this is a new horizon to strive for in the future – for example, in the form of an anthology of Estonian nature writing.

3.5. Interim conclusions

The main question that impels the semiotic study of nature, is the question about how humans as species fit in to the biological world, and what are the semiotic, communication-based mechanisms that underlie those relations. Here we need to turn to semiotics of nature, that can be divided into bio-, zoo- and ecosemiotics. All of these three branches rely on the notion of Umwelt as outlined by Jakob von Uexküll. Semiotically speaking, we share the ability to use iconic signs with all the other life forms, and indexical signs with other animals. The usage of symbolic signs abstracted from their immediate context is presumably a capability that is characteristic of only human species. Verbal comunication, including nature writing, belongs to the latter category, but it implicitly makes use of the previous sign types as well. Therefore, in nature writing the Umwelten of other species are mediated to human readers in our species-specific form.

The notion of biotranslation that has been initially discussed by Kalevi Kull and Peeter Torop concerns the same range of questions. Translation requires at least two different sign systems, and the successful transposition of meaning from one to the other. Both form and content must be translated. One basic syntactic structure that biotranslation relies on, is biological life cycle that organises the course of every living being. Biotranslation can be conceptualised as radical intersemiotic translation between Umwelten.

When we think of the methodological implications of biosemiotic study of nature writing, the questions of disciplinarity, interdisciplinarity and transdisciplinarity inevitably arise. On one hand, methodological purity and clear metalanguage are very important for the sake of the clarity of analysis and argument. On the other hand, nature writing, nature and environment in general are complex phenomena that require combined efforts from many disciplines in order to be comprehended in the most resultative way. There are both disciplinary and trans-disciplinary challenges that need to be encountered and solved in this endeavour, but the final outcome is worth the effort. Cooperation across the disciplinary borders under the aegis of environmental humanities promises a good platform for further studies.

CONCLUSIONS

The aim of the present thesis is to provide new perspectives into the study of nature writing by combining ecocriticism and semiotics. The analysis of nature representations in verbal texts from a biosemiotic perspective opens up a number of meaning layers that would remain unaddressed in the case of a classic literary analysis.

The first general question of interest in the semiotic study of nature writing is the relationship between a text as a communicative phenomenon and the environment. This relation is explained with the help of the nature-text model that embraces both cultural and natural meanings, and as such, is an inherently ecosemiotic notion. Text and environment influence, sometimes even condition each other mutually, and this is reflected in the textual representations of nature.

The second big question concerns the relationships of humans with their environment, as reflected and modelled in nature writing. This is connected with the notion of Umwelt, or a species-specific way of perceiving and reacting to the stimuli in one's environment that guides and informs our relations with the rest of the world. All living beings are rooted in their Umwelt-based perception of the environment, and human experience is no exception in that regard. Literature, including nature writing, is definitely a part of human Umwelt. It serves as a medium of our Umwelt-awareness, and it helps to establish more meaningful ties with our environment. Studying nature representations helps to learn about our ideas related to the rest of the nature. Based on this knowledge, we should be able to adjust our behaviour towards less harm.

In the three chapters of the present introduction, three main notions that bind together the six articles included in the thesis are explained.

The first chapter is devoted to the source material of the present thesis: Estonian nature writing. Nature writing is a specific type of non-fiction prose. The roots of nature writing are in a heterogenous array of different types of texts, such as travel writing, instructive texts, biological excursion, local history tales, etc. This is true about American nature writing that serves as an established example, against which we can measure the Estonian tradition. In order to limit the source material, "Estonian" is understood here as 'originally written in Estonian language'. The peculiar features of Estonian nature writing are, for example, that it contains folkloristic elements, biological information, pragmatic hints, and very personal, bodily experiences of the writers. The recurrence of such common features demonstrates that the local tradition of nature writing has shared elements in content and form. The texts are in intertextual relations to each other. A dynamic model of nature writing helps to conceptualise it as a new centre instead of a marginal area of other textual realms – belletristic texts, scientific texts and commodity texts. It also proves the idea originating from Russian Formalists, that a marginal genre or cultural phenomenon may appear as central when a slight shift occurs in cultural standards.

Nature writing in a narrow sense can be defined as documentary prose that is based on the author's personal, bodily experiences in nature, informed by knowledge of natural history and biology in general. The examples discussed in the included articles all belong to Estonian nature writing in the narrow sense, and my aim has been to bring them to a larger theroetical context.

In the second chapter, the notion of representation is discussed. The aim is to use representation as an analytical category in the semiotic study of nature writing. The starting point for the present understanding of the notion of representation comes from zoosemiotics, but the ideas about representation and mimesis stemming from ecocriticism and from classic literary theory are also taken into account. Representation in nature writing is a hybrid phenomenon that is conditioned by cultural conventions as well as by our species-specific Umwelt. Language shapes our perception of the world, and is a primary means for creating literary representations of our environment as featured in nature writing. At the same time, we also share other, pre-linguistic sign systems that are responsible for zoosemiotic modelling, with other animals. The traces of zoosemiotic modelling are always present in our cultural activities, including the production of verbal texts.

Text is understood here in its cultural semiotic meaning, that is, in a wider sense than 'text' in the strict sense of philology-based literary theory. Literary texts are characterised by dual accountability, that is, any text is always a part of a larger textual universe, as well as contains self-referentiality; but it also relies on the real world from which its imagery stems.

The concept of modelling as proposed by Tartu-Moscow school of semiotics proves useful when the mechanisms of the meaning-production of a text of nature writing need to be unraveled. Modelling is understood here as creating a certain principal construct for interpreting the world, based on the Umwelt of the model-maker. Model is a tool for communication, be it scientific or literary communication. A model relies on the perception and representations of its target objects by the modelling individual, as well as on the specific language that is used to make it. Functionality is an important criterium of a model: a model only functions properly in communication. Model is a multi-valent instrument that is well suitable for describing the phenomenon of nature writing.

The third chapter is devoted to methodological questions: how to integrate semiotics and ecocriticism into the larger field of environmental humanities? Semiotics of nature can be divided into bio-, eco- and zoosemiotics. The central notion that binds them together is that of Umwelt, originating from the works of Jakob von Uexküll. Biosemotic study of nature writing gives us tools for reading the Umwelten represented in nature writing. Thomas A. Sebeok has pioneered the field, and his research platform for the study of interspecies communication proves helpful in case of nature writing as well. The question is more complicated in case of plant narratives, but recent studies demonstrate that it is not an impossible task.

The notion of biotranslation as outlined by Kalevi Kull and Peeter Torop takes us one step further afield in the possible ways of conceptualising communication

across Umwelten. Translation can be understood in a narrow sense, as transmission of meaning from one human verbal language to another, or in a wider, semiotic sense, as a transposition of meaning from one sign system to another. Biotranslation can be conceptualised as radical intersemiotic translation between Umwelten.

From here, the questions of disciplinarity, interdisciplinarity and transdisciplinarity arise. Environmental humanities embrace different disciplines that can retain their disciplinary identities in the case of transdisciplinary research. If the reseach question is posed in a meaningful manner, each partner is able to contribute new knowledge to the common research. This requires meticulous communication regarding the material, methods, and central concepts, but the final outcome is worth the effort. The six publications included in the present thesis support the above-drawn conclusions. They also respond to the six hypotheses posed in the beginning of the study.

– Nature writing reveals where our Umwelten overlap with those of other species – even the Umwelten of humans and waterfowl overlap and link to a degree so that meaningful conclusions can be drawn and meaningful actions taken. Contextuality plays a great role in the meaning-generation in a nature-text.
– The perception of natural environments informs the ways the texts about them are composed – the knowledge of and movement in special places for other species, such as birds' nesting islets or remote woodlands where one can encounter charismatic megafauna are mediated in nature writing. The particular environmental conditions often determine the way how the narrative is set up. As texts and culture are locally situated, the knowledge related to particular places is transferred over time in nature writing, thus adding a historical dimension to it.
– Nature writing and nature-text can be explained in terms of modelling systems – the author, the environment, the reader and the text are interrelated in the nexus of nature-text. Modelling takes place on the zoosemiotic level, as well as on the level of verbal modelling, such as onomatopoetics in the case of renderings of bird calls, but also on the level of artistic modelling where the author chooses which aspects of the environment and/or other species s/he wants to bring to the fore, and which symbolic connotations s/he decides to attach to the behaviour of other species.
– Nature writing can be regarded as semiotic mediation between Umwelten – it may contain representations of life in environments that we as humans have no immediate access to, such as water. It is challenging, but rewarding to track how fish are represented and their Umwelt explained in fishing narratives from different types of environments. The particular environmental conditions often determine the way in which the narrative is set up. Biological characteristics, such as specific sensory organs of the represented species also play a role. Over- or under-interpretation of the target species may easily occur.

– Literature informs the ways in which readers perceive the environment and other species – for example, the understanding of human-fish relations can be ideologically and economically conditioned. Immediate experiences with other species may still provide a new perspective that is different from the initial one that was based on culturally mediated verbal accounts. The "filter" of writing works both ways.
– The study of nature writing benefits from a transdisciplinary approach – as demonstrated in the co-operative articles, nature writing enables to conduct multi-disciplinary research and to get meaningful results. Combining knowledge from literary theory and botany it is possible to reveal several interesting layers of meaning in a text that would perhaps remain somewhat cryptic from a single-discipline perspective. The dynamic model of nature writing supports such an approach.

In short, in the present thesis I have tried to conceptualise representations of nature in nature writing as a meaning-making practice. Semiotic analysis helps to reveal how nature writing guides our understanding of the environment and our ways or relating to it. Delineating a canon of "good" works is not enough; the mechanisms of how a viable human-nature relationship is modelled need to be studied and explicated.

Nature writing is an artistic model of the world, rooted in our species-specific Umwelt based ways of modelling. Models have a primarily communicative function. Texts of nature writing are generated based on zoosemiotic modelling that is subsequently turned into verbal and artistic modelling. When we analyse a piece of nature writing, the artistic level of modelling comes first; then we can proceed to linguistic modelling and then to zoosemiotic modelling that lies in the bottom of each text. All levels of perception need to be taken into account. As a special type of text, nature writing encourages a reader to proceed beyond the text, to the natural phenomena that have been represented in these texts. It is also important to bear in mind that human cultural representations have an impact on real animals and environments.

Overlapping of the Umwelten of different species enables inter-species' sign exchange, mutual understanding and in many occasions, cross-species communication. The discussion over the possibility of biotranslation needs to be continued.

It is proposed that the original contribution of the present work into the general semiotic discussion lies in relating the concepts of text, Umwelt, model, and representation to each other and demonstrating how meaning is created in nature writing in their interplay. By analysing the notion of representation, a better understanding of human sign-use practices is achieved, as well as a better understanding of the application possibilities of human signification in inter-species' communication.

REFERENCES

Anderson, James R. 2000. Primates and representations of self. In: Fagot, Joël (ed.), *Picture Perception in Animals*. East Sussex: Psychology Press, 373–396.

Anderson, Myrdene; Deely, John; Krampen, Martin; Ransdell, Joseph; Sebeok, Thomas A.; Uexküll von, Thure 1984. A semiotic perspective on the sciences: Steps toward a new paradigm. *Semiotica* 52 (1/2), 7–47.

Annist, August; Roos, Jaan; Käis, Johannes 1940. *Eesti populaarteaduslik kirjandus: kuidas see on arenenud ja mida pakub see praegu*. Tartu: Eesti Kirjanduse Selts.

Annus, Epp; Epner, Luule; Järv, Ants; Olesk, Sirje; Süvalep, Ele; Velsker, Mart 2001. *Eesti kirjanduslugu*. Tallinn: Koolibri.

Aristoteles 2003. *Luulekunstist (Poeetika)*. Transl. Jaan Unt. Tallinn: Keel ja Kirjandus.

Aristotle 1920. *On the Art of Poetry*. Transl. Ingram Bywater. Oxford: Clarendon Press.

Armbruster, Karla; Wallace, Kathleen R. (eds.) 2001. *Beyond Nature Writing. Expanding the Boundaries of Ecocriticism*. Charlottesville, London: University Press of Virginia.

Auerbach, Erich 2012. *Mimesis. Tegelikkuse kujutamine õhtumaises kirjanduses*. Transl. Kalle Kasemaa. Tartu: Ilmamaa.

Bahtin, Mihhail 1987. *Valitud töid*. Tallinn: Eesti Raamat.

Bardone, Ester; Pungas-Kohv, Piret 2015. Changing values of wild berries in Estonian households: Recollections from an ethnographic archive. *Journal of Baltic Studies*, 46 (3), 319–336.

Becher, Tony 1987. Disciplinary discourse. *Studies in Higher Education* 12 (3), 261–274.

Berg, Bengt 1923. *De sista örnarna*. Stockholm: Norstedt.

Berg, Bengt 1960. *Örnar*. Stockholm: Tiden.

Berg, Bengt 1972. *Viimased kotkad*. Transl. Henrik Sepamaa. Tallinn: Eesti Raamat.

Bergthaller, Hannes; Emmett, Rob; Johns-Putra, Adeline; Kneitz, Agnes; Lidström, Susanna; McCorristine, Shane; Pérez-Ramos, Isabel; Phillips, Dana; Rigby, Kate; Robin, Libby 2014. Mapping common ground: Ecocriticism, environmental history, and the environmental humanities. *Environmental Humanities* 5, 261–276.

Beyer, Jürgen 2004. Whom should one thank for a narrow escape? Lessons drawn from a perilous journey from Vormsi and Noarootsi to Finland in 1796. *Pro Ethnologia* 17, 175–195.

Buell, Lawrence 2005. *The Future of Environmental Criticism: Environmental Crisis and Literary Imagination*. Malden: Blackwell.

Buell, Lawrence 2001. *Writing for an Endangered World. Literature, Culture, and the Environment in the U.S. and Beyond*. Cambridge, London: The Belknap Press.

Buell, Lawrence 1995. *The Environmental Imagination. Thoreau, Nature Writing, and the Formation of American Culture*. Cambridge, London: The Belknap Press.

Campbell, SueEllen 1996. The land and language of desire: where deep ecology and post-structuralism meet. In: Glotfelty, Cheryll; Fromm, Harold (eds.), *The Eco-criticism Reader: Landmarks in Literary Ecology*. Athens, London: The University of Georgia Press, 124–136.

Cobley, Paul 2010. Introduction. In: Cobley, Paul (ed.), *The Routledge Companion to Semiotics*. London, New York: Routledge, 3–12.

Cobley, Paul 2001. Analysing narrative genres. *Sign Systems Studies*, 29.2, 479–502.

Cohen, Michael P. 2004. Blues in the green: Ecocriticism under critique. *Environmental History* 9 (1), 9–36.

Corti, Maria 1978. *An Introduction to Literary Semiotics*. Bloomington, London: Indiana University Press.
Cuddon, John Anthony 1992. *The Penguin Dictionary of Literary Terms and Literary Theory*. London: Penguin.
Day, Robert A.; Gastel, Barbara 2006. *How to Write and Publish a Scientific Paper*. Westport, London: Greenwood Press.
Deely, John 2005. *Semiootika alused*. Transl. Kati Lindström. Tartu: Tartu Ülikooli Kirjastus.
Eco, Umberto 1994. *Six Walks in the Fictional Woods*. Cambridge, London: Harvard University Press.
Eilart, Jaan 1976. *Inimene, ökosüsteem ja kultuur. Peatükke looduskaitsest Eestis*. Tallinn: Perioodika.
Elder, John 2001. The poetry of experience. In: Armbruster, Karla; Wallace, Kathleen R. (eds.), *Beyond Nature Writing. Expanding the Boundaries of Ecocriticism*. Charlottesville, London: University Press of Virginia, 312–324.
Elder, John; Finch, Robert 2002. Introduction. In: Finch, Robert; Elder, John (eds.) *Nature Writing: The Tradition in English*. New York, London: W.W.Norton & Company, 15–20.
Ernits, Peeter 2005. *Kivialused ja teised*. Tallinn: Maalehe Raamat.
Farina, Almo; Belgrano, Andrea 2006. The eco-field hypothesis: Toward a cognitive landscape. *Landscape Ecology* 21, 5–17.
Finch, Robert; Elder, John 2002. *Nature Writing: The Tradition in English*. New York, London: W.W.Norton & Company.
Fridolin, Evelyn 2015. *Peipsi-kirjanduse geokriitiline analüüs*. Magistritöö. Tartu Ülikool: Kultuuriteaduste ja kunstide instituut.
Garrard, Greg 2010. Ecocriticism. *The Year's Work in Critical and Cultural Theory* 18 (1), 1–35.
Garrard, Greg 2004. *Ecocriticism*. London, New York: Routledge.
Giere, Ronald N. 2004. How models are used to represent reality. *Philosophy of Science*, 71, 742–752.
Glotfelty, Cheryll 1996. Introduction: Literary studies in an age of environmental crisis. In: Glotfelty, Cheryll; Fromm, Harold (eds.), *The Ecocriticism Reader: Landmarks in Literary Ecology*. Athens, London: The University of Georgia Press, xv–xxxvii.
Glotfelty, Cheryll; Fromm, Harold (eds.) 1996. *The Ecocriticism Reader: Landmarks in Literary Ecology*. Athens, London: The University of Georgia Press.
Goodbody, Axel; Rigby, Kate (eds.) 2011. *Ecocritical theory: New European approaches*. Charlottesville, London: University of Virginia Press.
Gorlée, Dinda L. 1994. *Semiotics and the Problem of Translation: With Special Reference to the Semiotics of Charles S. Peirce*. Amsterdam, Atlanta: Rodopi.
Hartman, Steven; McGovern, Thomas 2014. Integrating humanities scholarship whithin the science of global environmental change: The example of inscribing environmental memory in the Icelandic sagas (IEM), an IHOPE case study. In: Rattasepp, Silver (ed.), *Framing Nature: Signs, Stories, and Ecologies of Meaning. Abstracts*. Tartu: University of Tartu Press, 8–9.
Helmreich, Stefan 2009. *Alien Ocean: Anthropological Voyages in Microbial Seas*. Berkeley: University of California Press.
Hennoste, Tiit 2003. Kirjanduse periodiseerimisest I. Taustast ja teooriast. In: Hennoste, Tiit. *Eurooplaseks saamine. Kõrvalkäija altkulmupilk*. Tartu: Tartu Ülikooli Kirjastus, 57–85.

Hiiemäe, Mall 2016. *Väike linnuraamat rahvapärimusest*. Tartu: Eesti Kirjandusmuuseumi Teaduskirjastus.
Hoffmeyer, Jesper 2008. *Biosemiotics. An Examination into the Signs of Life and the Life of Signs*. Transl. Jesper Hoffmeyer, Donald Favareau. Scranton, London: University of Scranton Press.
Hoffmeyer, Jesper 1996. *Signs of Meaning in the Universe*. Transl. Barbara J. Haveland. Bloomington and Indianapolis: Indiana University Press.
Hoppál, Mihály 2008. *Etnosemiootika*. Transl. Eda Pomozi. Tartu: Eesti Kirjandusmuuseumi Teaduskirjastus.
Howarth, William 1996. Some principles of ecocriticism. In: Glotfelty, Cheryll; Fromm, Harold (eds.), *The Ecocriticism Reader: Landmarks in Literary Ecology*. Athens, London: The University of Georgia Press, 69–91.
Hutcheon, Linda 1996. *A Poetics of Postmodernism. History, Theory, Fiction*. New York, London: Routledge.
Ingram, Annie Merrill; Marshall, Ian; Philippon, Daniel J.; Sweeting, Adam W. (eds.) 2007. *Coming into Contact: Explorations in Ecocritical Theory and Practice*. Athens, London: The University of Geogria Press.
Jakobson, Roman 2010 [1959]. Tõlkimise keelelistest aspektidest. Transl. Elin Sütiste. *Acta Semiotica Estica* VII, 299–305.
Jansen, Ea; Põldmäe, Rudolf 1968. *Carl Robert Jakobson*. Tallinn: Eesti Raamat.
Jüssi, Fred 1966. *Kajakad kutsuvad. Saaremaa, Vilsandi ja Vaika saarte linnuriigist ja loodusest*. Tallinn: Eesti Raamat.
Kepp, Õnne 2011. Aegruumilised suhted eesti luules aastatel 1860–1917. Ühine ja sidus looduskujund. In: Veidemann, Rein; Kepp, Õnne (eds.), *Kõnetav kultuur*. Tallinn: Eesti Keele Sihtasutus, 35–52.
Kirksey, S. Eben; Helmreich, Stefan 2010. The emergence of multispecies ethnography. *Cultural anthropology* 25 (4), 545–576.
Kull, Kalevi 2011. Biosemiootika. In: Tamm, Marek (ed.), *Humanitaarteaduste metodoloogia. Uusi väljavaateid*. Tallinn: TLÜ Kirjastus, 153–169.
Kull, Kalevi 2010. Umwelt and modelling. In: Cobley, Paul (ed.), *The Routledge Companion to Semiotics*. London, New York: Routledge, 43–56.
Kull, Kalevi 2009. Vegetative, animal, and cultural semiosis: The semiotic threshold zones. *Cognitive Semiotics* 4, 8–27.
Kull, Kalevi (guest ed.) 2001, *Semiotica. Jakob von Uexküll: a paradigm for biology and semiotics*, 134 (1/4).
Kull, Kalevi 1999. Towards biosemiotics with Yuri Lotman. Semiotica 127 (1/4), 115–131.
Kull, Kalevi 1998. Semiotic ecology: Different natures in the semiosphere. *Sign Systems Studies* 26, 344–371.
Kull, Kalevi; Nöth, Winfried 2001. Introduction: Special issue on semiotics of nature. *Sign Systems Studies* 29 (1), 9−11.
Kull, Kalevi; Torop, Peeter 2003. Biotranslation: Translation between Umwelten. In: Petrilli, Susan (ed.), *Translation Translation*. Amsterdam, New York: Rodopi, 315–328.
Kuresoo, Rein 2001. *Loodus on lähedal*. Tallinn: Maalehe Raamat.
Lagerlöf, Selma 1932. *Nils Holgerssoni imelik teekond läbi Rootsi*. Transl. Adelaide Lemberg. Tartu: Loodus.
Leito, Tiit 1984. *Aastaring laidudel*. Tallinn: Valgus.

Lioi, Anthony 2010. Special forum on ecocriticism and theory. An introduction. *ISLE* 17 (4), 754–799.
Lotman, Juri 1999. *Semiosfäärist*. Transl. Kajar Pruul. Tallinn: Vagabund.
Lotman, Juri 1991. *Kultuurisemiootika: tekst – kirjandus – kultuur*. Transl. Pärt Lias, Inta Soms, Rein Veidemann. Tallinn: Olion.
Lotman, Juri M.; Ivanov, Vjacheslav V.; Pjatigorskij, Aleksandr M.; Toporov, Vladimir N.; Uspenskij, Boris A. 2013. Theses on the semiotic study of cultures (as applied to Slavic texts). In: Salupere, Silvi; Torop, Peeter; Kull, Kalevi (eds.), *Beginnings of the Semiotics of Culture*. Tartu Semiotics Library, 13. Tartu: University of Tartu Press, 53–77.
Love, Glen A. 2003. *Practical Ecocriticism: Literature, Biology, and the Environment*. Charlottesville, London: University of Virginia Press.
Lukas, Liina 2008. Balti kirjakultuuri mitmekeelsest loomust. In: Undusk, Rein (ed.), *Rahvuskultuur ja tema teised*. Tallinn: Underi ja Tuglase Kirjanduskeskus, 23–33.
Lukas, Liina; Plath, Ulrike; Tüür, Kadri (eds.) 2011. *Umweltphilosophie und Landschaftsdenken im Baltischen Kulturraum. Environmental Philosophy and Landscape Thinking*. Tallinn: Underi ja Tuglase Kirjanduskeskus.
Lummaa, Karoliina 2010. *Poliittinen siivekäs. Lintujen konkreettisuus suomalaisessa 1970-luvun ympäristörunoudessa*. Jyväskylä: Jyväskylän Yliopisto.
Lyon, Thomas 2001. *This Incomparable Land: A Guide to American Nature Writing*. Minneapolis: Milkweed Editions.
Mäger, Mart 1994. *Linnud rahva keeles ja meeles*. Tallinn: Koolibri.
Maran, Timo 2014. Biosemiotic criticism: Modelling the environment in literature. *Green Letters: Studies in Ecocriticism*, 18 (3), 297–311.
Maran, Timo 2013. Biosemiootiline kriitika: keskkonna modelleerimine kirjanduses. *Akadeemia* 5, 824–847.
Maran, Timo 2010. An ecosemiotic approach to nature writing. *PAN: Philosophy, Activism, Nature* 7, 79–87.
Maran, Timo 2008. *Mimikri semiootika*. Tartu: Tartu Ülikooli Kirjastus.
Maran, Timo 2007a. Liikidevaheline kommunikatsioon ja Thomas A. Sebeoki zoosemiootika uurimisplatvorm. In: Rattasepp, Silver; Maran, Timo (eds.), *Kommunikatsiooni teooria*. Schola biotheoretica XXXIII. Tartu: Eesti Looduseuurijate Selts, 36–47.
Maran, Timo 2007b. Ökosemiootilise analüüsi perspektiivid: loodusteksti mõiste. *Acta Semiotica Estica* IV, 48–72.
Maran, Timo; Tønnessen, Morten; Armstrong Oma, Kristin; Kiiroja, Laura; Magnus, Riin; Mäekivi, Nelly; Rattasepp, Silver; Thibault, Paul; Tüür, Kadri 2016. *Animal Umwelten in a Changing World: Zoosemiotic Perspectives*. Tartu Semiotics Library, 18. Tartu: University of Tartu Press.
Maran, Timo; Tüür, Kadri 2017. From birds and trees to texts: An ecosemiotic look at Estonian nature writing. In: Parham, John; Westling, Louise (eds.), *A Global History of Literature and the Environment*. Cambridge: Cambridge University Press, 286–300.
Maran, Timo; Tüür, Kadri 2001. On Estonian nature writing. *Estonian Literary Magazine* 13, 4–11.
Martinelli, Dario 2007. *Zoosemiotics: Proposals for a Handbook*. Acta Semiotica Fennica XXVI. Imatra, Helsinki: The International Semiotics Institute.

Mazel, David 1996. American literary environmentalism as domestic orientalism. In: Glotfelty, Cheryll; Fromm, Harold (eds.), *The Ecocriticism Reader: Landmarks in Literary Ecology*. Athens, London: The University of Georgia Press, 137–146.
Meeker, Joseph W. 1997 [1974]. *The Comedy of Survival: Literary Ecology and Play Ethic*. Tucson: The University of Arizona Press.
de Michiel, Margherita 1999. Mikhail M. Bakhtin: Prolegomena to a Theory of Translation. *S: European Journal for Semiotic Studies* 11 (4), 687–698.
Moran, Joe 2014. A cultural history of the new nature writing. *Literature & History* 23 (1), 49–63.
Morris, Charles 1971. *Writings on the General Theory of Signs*. Approaches to Semiotics, 10. The Hague, Paris: Mouton.
Morton, Timothy 2007. *Ecology without Nature. Rethinking Environmental Aesthetics*. Cambridge, London: Harvard University Press.
Morton, Timothy 2005. Environmentalism. In: Roe, Nicholas (ed.) *Romanticism: An Oxford Guide*. Oxford: Oxford University Press, 696–707.
Murphy, Patrick D. 1995. *Literature, Nature and Other. Ecofeminist Critiques*. Albany: State University of New York Press.
Nöth, Winfried 1998. Ecosemiotics. *Sign Systems Studies* 26, 332–343.
Parham, John; Westling, Louise (eds.) 2017. *A Global History of Literature and the Environment*. Cambridge: Cambridge University Press.
Parijõgi, Jüri 1929. *Kevad kutsub: reisimälestusi Muhu- ja Saaremaalt*. Tallinn: Eesti Õpetajate Liit.
Phillips, Dana 1996. Is nature necessary? In: Glotfelty, Cheryll; Fromm, Harold (eds.), *The Ecocriticism Reader: Landmarks in Literary Ecology*. Athens, London: The University of Georgia Press, 204–222.
Piiper, Johannes 1935. *Pilte ja hääli kodumaa loodusest: loodusesõbra muljeid maalt ja merelt*. Tartu: Noor-Eesti.
Pocock, Douglas Charles David (ed.) 1988. *Humanistic Approaches in Geography*. Durham: University of Durham.
Põldmaa, Kustas 1973. *Koduvetel*. Tallinn: Valgus.
Plath, Ulrike 2011a. *Esten und Deutsche in den baltischen Provinzen Russlands. Fremdheitskonstruktionen, Lebenswelten, Kolonialphantasien 1750–1850*. Wiesbaden: Harrassowitz.
Plath, Ulrike 2011b. Baltisaksa laste- ja noorsookirjandusest kuni 1840. aastateni. *Keel ja Kirjandus* 8–9, 698–715.
Plath, Ulrike 2009. Kadunud kuldne kese. Kuus pilti Eesti ajaloost rahvusüleses kollaažis. *Vikerkaar* 7–8, 91–98.
Plath Ulrike 2008. Rändrahnud ja majaisandad. *Vikerkaar* 7–8, 113–122.
Rebassoo, Haide-Ene 1975. *Botaanilisi kilde 17 Hiiumaa suvest*. Tallinn: Valgus.
Ridala, Villem 1921. *Ringi mööda kodumaad*. Tallinn: Maa.
Rigby, Kate 2015. Art, nature and the poesy of plants in the Goethezeit: A biosemiotic perspective. *Goethe Yearbook: Publications of the Goethe Society of North America* 22, 23–44.
Roht, Richard 1951. *Jutte loomadest*. Tallinn: Eesti Riiklik Kirjastus.
Ruskin, John 2000 [1856]. Landscape, Mimesis and Morality. In: Coupe, Laurence (ed.), *The Green Studies Reader. From Romanticism to Ecocriticism*. London: Routledge, 26–31.
Salupere, Silvi; Torop, Peeter 2013. Introduction. On the beginnings of the semiotics of culture in the light of the Theses of the Tartu-Moscow School. In: Salupere, Silvi;

Torop, Peeter; Kull, Kalevi (eds.), *Beginnings of the Semiotics of Culture*. Tartu Semiotics Library, 13. Tartu: University of Tartu Press, 14–37.
Scheese, Don 1996. *Nature Writing: The Pastoral Impulse in America*. New York: Twayne Publishers.
Sebeok, Thomas A. 1994. *Signs: An Introduction to Semiotics*. Toronto, Buffalo: University of Toronto Press.
Sebeok, Thomas A. 1990. *Essays in Zoosemiotics*. Toronto: Toronto Semiotic Circle.
Sebeok, Thomas A. 1986. "Talking" with animals: Zoosemiotics explained. In: Deely, John; Williams, Brooke; Kruse, Felicia E. (eds.), *Frontiers in Semiotics*. Bloomington: Indiana University Press, 76–82.
Šklovski, Viktor 2012. Sõna elluäratamine. *Vikerkaar* 3, 45–50.
Šklovski, Viktor 1993. Kunst kui võte. *Vikerkaar* 8, 55–64.
Slovic, Scott 1996. Nature writing and environmental psychology: The interiority of outdoor experience. In: Glotfelty, Cheryll; Fromm, Harold (eds.), *The Ecocriticism Reader: Landmarks in Literary Ecology*. Athens, London: The University of Georgia Press, 351–370.
Soovik, Ene-Reet 2002. 'To Be a Landscape': Some Aspects of Landscape Representation in Paul-Eerik Rummo's Poetry. In: Sarapik, Virve; Tüür, Kadri; Laanemets, Mari (eds.), *Koht ja paik / Place and Location* II. Tallinn: Eesti Kunstiakadeemia, 499–510.
Sörlin, Sverker 2012. Environmental humanities: Why should biologists interested in the environment take the humanities seriously? *BioScience* 62 (9), 788–789.
Sõukand, Renata; Kalle, Raivo 2016. *Changes in the Use of Wild Food Plants in Estonia: 18th–21st Century*. Cham: Springer.
Speek, Tiiu 1996. Ökokriitikast. *Akadeemia* 11, 2373–2380.
Sütiste, Elin 2009. *Tõlke mõiste dünaamikast tõlketeaduses ja eesti tõlkeloos*. Tartu: Tartu Ülikooli Kirjastus.
Talivee, Elle-Mari 2016. Tuglase siil. *Looming* 7, 1000–1006.
Tally, Robert Jr. 2013. *Spatiality*. London, New York: Routledge.
Tan, Klyth Soo-Hong 2010. ASLE's ecocritical multinationalism. *ISLE* 17 (4), 789–792.
Thom, Alma 1932. *Vilsandi linnuriik*. Tartu: Loodus.
Tondl, Ladislav 2000. Semiotic foundation of models and modelling. In: Bernard, Jeff; Grzybek, Peter; Withalm, Gloria (eds.), *Modellierungen von Gescichte und Kultur. Modelling History and Culture*. Band I / Vol I. Wien: ÖGS, 81–89.
Tõnjanov, Juri 2014. Kirjandusfakt. Transl. Kajar Pruul. In: Väljataga, Märt (ed.), *Kirjandus kui selline: valik vene vormikoolkonna tekste*. Tallinn: TLÜ Kirjastus, 199–291.
Tønnessen, Morten; Magnus, Riin; Brentari, Carlo 2016. The biosemiotic glossary project: Umwelt. *Biosemiotics* 9, 129–149.
Tønnessen, Morten; Tüür, Kadri 2014. The semiotics of animal representations: Introduction. In: Tüür, Kadri; Tønnessen, Morten (eds.), *The Semiotics of Animal Representations*. Nature, Culture, Literature 10. Amsterdam, New York: Rodopi, 7–30.
Torop, Peeter 2011. *Tõlge ja kultuur*. Tallinn, Tartu: Tartu Ülikooli Kirjastus.
Torop, Peeter 2000. Intersemiosis and intersemiotic translation. *S: European Journal for Semiotic Studies*, 12 (1), 71–100.
Tüür, Kadri 2016. Keskkonnahumanitaaria: teispool kultuuri ja loodust. *Vikerkaar* 6, 71–80.
Tüür, Kadri 2007. Looduskirjanduse määratlus. *Acta Semiotica Estica* IV, 73–96.

Tüür, Kadri; Maran, Timo 2005. Eesti looduskirjanduse lugu. In: Maran, Timo; Tüür, Kadri (eds.), *Eesti looduskultuur*. Tartu: Eesti Kirjandusmuuseum, 237–270.
Tüür, Kadri 2004a. Nature writing and intersemiosis. In: Grishakova, Marina; Lehtimäki, Markku (eds.), *Intertextuality and Intersemiosis*. Tartu: Tartu Ülikooli Kirjastus, 151–167.
Tüür, Kadri 2004b. Alma Toom, looduskirjanik Vilsandilt. *Eesti Loodus* 6, 22–25.
Tüür, Kadri 2003. *Eesti looduskirjandus: määratlus ja klassifikatsioonid*. Magistritöö. Tartu Ülikool: Semiootika osakond.
Uexküll, Jakob von 1982 [1940]. The Theory of Meaning. *Semiotica* 42 (1), 25–82.
Ulman, H. Lewis 2001. Beyond nature / writing: Virtual landscapes online, in print, and in "real life". In: Armbruster, Karla; Wallace, Kathleen R. (eds.), *Beyond Nature Writing. Expanding the Boundaries of Ecocriticism*. Charlottesville, London: University Press of Virginia, 341–356.
Velmezova, Ekaterina; Kull, Kalevi 2016. Tõlkimine kui zoosemiootika põhiküsimus: Aleksei Turovski ja Tartu-Moskva koolkond. *Acta Semiotica Estica* XIII, 197–210.
Wallace, Kathleen R.; Armbruster, Karla 2001. Introduction: Why go beyond nature writing, and where to? In: Armbruster, Karla; Wallace, Kathleen R. (eds.), *Beyond Nature Writing. Expanding the Boundaries of Ecocriticism*. Charlottesville, London: University Press of Virginia, 1–25.
Warren, Jim 2010. Placing ecocriticism. *ISLE* 17 (4), 770–772.
Wellek, René; Warren, Austin 2010. *Kirjandusteooria*. Transl. Urmas Tõnisson, Ene-Reet Soovik, Katre Ligi. Tartu: Ilmamaa.
Wess, Robert 2010. The theory ecocriticism needs. *ISLE* 17 (4), 762–765.
Westling, Louise 2014. *The Logos of the Living World: Merleau-Ponty, Animals, and Language*. New York: Fordham University Press.
Westphal, Bertrand 2011. *Geocriticism: Real and Fictional Spaces*. Transl. Robert Tally Jr. Basingstoke, New York: Palgrave Macmillan.
Wheeler, Wendy 2011. The biosemiotic turn: Abduction, or, the nature of creative reason in nature and culture. In: Goodbody, Axel; Rigby, Kate (eds.), *Ecocritical Theory: New European approaches*. Charlottesville, London: University of Virginia Press, 270–282.
Wheeler, Wendy 2006. *The Whole Creature: Complexity, Biosemiotics and the Evolution of Culture*. London: Lawrence & Wishart.

Web resources

asle.org – Association for the Study of Literature and Environment
ihopenet.org/cicrumpolarnetworks – Integrated History and Future of People on Earth initiative
kjt.ee – web journal Kirik ja teoloogia
plato.stanford.edu – Stanford Encyclopedia of Philosophy

KOKKUVÕTE

Looduskujutuse semiootika: looduskirjanduse näitel

Käesoleva töö eesmärgiks on avada uusi perspektiive looduskirjanduse uurimisel semiootika ja ökokiitika vahendeid kombineerides. Looduskirjanduse uurimine biosemiootilisest perspektiivist avab mitmeid uusi tähenduskihte, mis tavapärase kirjandusanalüüsi abil jääksid varjatuks.

Esimene üldine küsimus töös puudutab looduskirjandust kui keskkonda ja teksti ühendavat kommunikatsioonilist nähtust. Selle selgitamiseks sobib hästi loodusteksti mudel, mis hõlmab nii kultuurilisi kui loodusest tulenevaid tähendusi, ühendades need ökosemiootilise analüüsi jaoks sobivaks koosluseks. Tekstid ja looduskeskkond tingivad, vahel isegi kujundavad üksteist vastastikku. Ka seda on võimalik looduskirjanduse semiootilises analüüsis esile tuua.

Teine suurem küsimustering puudutab inimeste suhteid oma keskkonnaga, mida looduskirjanduses modelleeritakse. Siin tuleb mängu omailma (Umwelt) mõiste – liigiomane viis oma keskkonna tajumiseks ning selle mõjutamiseks, mille alusel kujunevad meie suhted ülejäänud maailmaga. Omailma kaudu oleme seotud oma keskkonnaga. Kõik elusolendid suhestuvad maailmaga vastavalt enda omailmale ehk enda kehaplaanis olemas olevatele taju- ja mõjuorganitele ning nende poolt pakutavatele võimaldustele; ka inimene ei ole erand. Verbaalne keel ning sellel põhinev kirjanduslik kommunikatsioon on inimese omailma spetsiifiliseks osaks. See vahendab meile metatasandil teadlikkust omaenese omailmast, aga võimaldab teha ka sissevaateid teiste liikide omailmadesse. Looduskujutuse uurimine omailma terminites aitab meil mõista, kuidas kujuneb meie arusaam teistest liikidest ja meie ühisest keskkonnast. Selle teadmise põhjal oleme põhimõtteliselt võimelised muutma oma käitumist selliselt, et see põhjustaks ümbritsevale ja meile endile senisest vähem kahju.

Sissejuhatuses selgitatakse kolme põhilist mõistelist sõlmpunkti, mis ühendavad terviklikuks käsitluseks kõiki kuut töös esitatud artiklit.

Esimeses peatükis käsitletakse töö peamist materjali – eesti looduskirjandust. Selle all mõistetakse algupäraselt eesti keeles kirjutatud dokumentaalproosat, mis põhineb autori isiklikel looduskogemustel ning loodusteaduslikul informatsioonil ning annab seda edasi kirjanduslikus keeles. Kuna looduskirjanduse määratlemine eraldi tekstitüübina on saanud alguse Ameerika kirjandusest, on võrreldud eesti ja ameerika looduskirjanduse sarnasusi ja erijooni ning visandatud eesti looduskirjandusele eriomaste tunnuste komplekt, nagu suur rahvaluule, loodusteadusliku informatsiooni ning autori kehaliste kogemuste osakaal tekstides. Looduskirjanduse tekstid on sageli omavahelistes intertekstuaalsetes suhetes. Looduskirjanduse dünaamiline mudel aitab kontseptualiseerida looduskirjandust eristuva tekstidekogumi, mitte teiste suuremate tekstitüüpide marginaalse servaalana.

Teises peatükis on tähelepanu all kujutamine (representation) ja modelleerimine ning nende vahekord looduskirjanduse näitel. Representatsiooni mõistet kasutatakse analüütilise kategooriana looduskirjanduse semiootilisel analüüsil.

Representatsiooni (kujutamise) ja mimeesi (*mimesis*) mõisteid on kasutatud nii klassikalises kirjandusteaduses kui ka ökokriitilistes käsitlustes (Lawrence Buell, Timothy Morton) ning zoosemiootilistes uurimustes. Käesolevas töös on representatsiooni mõiste aluseks võetud zoosemiootiline arusaam, kus see määratletakse tähistamise ja kommunikatsiooni mõistetega seoses, eristades seda kvalitatiivselt kummastki nimetatud tähendusloome mehhanismist. Representatsioonina käsitletakse käesolevas töös keskkonna vahendatud esitamist inimkeele kasutamise erijuhu – kirjanduse – vahenditega. Representatsioon looduskirjanduses on hübriidne nähtus, mis hõlmab nii kultuurilisi norme kui omailma-spetsiifilisi tähistuspraktikaid. Inimese keelevõime kujundab meie arusaama ümbritsevast keskkonnast ning on esmaseks vahendiks kirjanduslike kujutuste loomisel. Samal ajal jagame keele-eelseid tähendusloome mehhanisme paljude teiste liikidega. Zoosemiootilise modelleerimise jälgi leiame kõigist inimtegevuse valdkondadest.

Teksti mõistetakse siin Tartu-Moskva koolkonna eeskujul laialt, kui igasugust terviklikku kultuurisemiootilist fenomeni. Kirjandustekstidele kitsamas mõttes on omane kahetine määratus (*dual accountability*) – kuuludes kirjanduslike väljendusvormide hulka, on nad alati osa suuremast tekstikogumist, kuid sisaldavad tekstuaalse terviklikkuse loomise vajaduse tõttu ka eneseleviitavaid elemente. Samas toetuvad tekstid alati ka teataval määral reaalse maailma kogemusele, millest nende kujundid võrsuvad.

Tartu-Moskva koolkonna poolt kasutusele võetud modelleerimise mõiste osutub heaks abinõuks, kui on vaja selgitada loodusteksti tähendusloome mehhanismide toimimist. Modelleerimist käsitlen kui teatud konstruktsiooni, mis on abiks maailma tõlgendamisel ning mis põhineb mudeli looja omailmal. Mudel on kommunikatsioonivahend, võimaldades nii kirjanduslikku kui teaduslikku kommunikatsiooni. Modelleerija loob mudeli oma tajudele tuginedes ja valib selle laadi vastavalt eesmärkidele (teadus, kirjandus vm). Representatsioonid kuuluvad (loodus)kirjandusliku mudeli koosseisu. Mudeli puhul on oluline, et tal oleks funktsioon, seda nii oma looja kui vastuvõtja jaoks. Mudel on multivalentne tööriist, mis sobib hästi looduskirjanduse fenomeni kirjeldamiseks.

Töö kolmas peatükk on pühendatud metodoloogilistele küsimustele: kuidas ühendada semiootikat ja ökokriitikat ning neid omakorda laiema keskkonnahumanitaaria väljaga? Loodussemiootika võib jagada bio-, öko- ja zoosemiootikaks, mida ühendab kolmandas peatükis pikemalt käsitletud omailma mõiste. Looduskirjanduse biosemiootiline analüüs tugineb algselt Thomas A. Sebeoki poolt välja pakutud liikidevahelise kommunikatsiooni uurimisplatvormile, mida saab kohaldada ka kirja pandud looduskujutuse uurimiseks. Edaspidi on põhjalikumalt vaja tegeleda nii taimede kujutamise uurimiseks sobilike meetodite välja töötamise kui ka biotõlke mõistega. Tõlget võib mõista nii kitsalt kui verbaalse teksti tõlget ühest loomulikust keelest teise kui ka laiemalt, kui tähenduse ülekannet ühest semiootilisest süsteemist teise, isegi ühest omailmast teise.

Siit jõuame distsipilinaarsuse, aga ka inter- ja trans-distsiplinaarsuse küsimuste juurde. Keskkonnahumanitaaria võimaldab tuua kokku eri distsipliinid, et

teha erialadeülest koostööd keskkonnaprobleemide uurimisel. Vaja on püstitada mõtestatud uurimisküsimus, millele iga eriala esindajad saaksid anda vastuse neile harjumuspäraseid allikmaterjale ja uurimisvõtteid kasutades. See nõuab jõupingutusi, kuid on vaeva väärt.

Töösse koondatud kuues artiklis leiavad positiivse vastuse töö algul püstitatud kuus hüpoteesi:

- Looduskirjandus osutab, kus inimese omailm langeb kokku teiste liikide omailmadega;
- Looduskeskkonna tajumine suunab seda, mil viisil temast kirjutatakse;
- Looduskirjandust ja loodusteksti kui nähtusi saab selgitada modelleerivate süsteemidena;
- Looduskirjandust võib vaadelda kui omailmade semiootilist vahendamist;
- Kirjandustekstid suunavad seda, kuidas lugejad keskkonda ning teisi liike tajuvad;
- Looduskirjanduse uurimisel on transdistsiplinaarsest lähenemisest kasu.

Artikkel I, "Loomade kujutamine tekstides: semiootiline analüüs" pakub ühe näite zoosemiootilise metodoloogia rakendamisest eesti looduskirjanduse näitel. Analüüsimaterjaliks on Fred Jüssi tekst "Hääled", mida vaadeldakse kui loodusteksti, milles kombineeruvad keskkonnast saadav informatsioon, autori vahetud tähelepanekud, lugejate kompetents ning tekstuaalsed praktikad ja valikud. Artiklis vaadeldakse loodusteaduslike taustateadmiste rolli tähenduse kujunemisel, aga ka tähendustekkemehhanisme inimeste ja lindude omailmade kattumisalas. Selles artiklis tuuakse esile ka biotõlke küsimus.

Artikkel II kannab pealkirja "Lindudest ja puudest tekstideni: ökosemiootiline vaade eesti looduskirjandusele" ning on valminud koostöös Timo Maraniga. Artikli algul antakse põgus ülevaade eestikeelse looduskirjanduse kujunemisloost ning ökosemiootilise analüüsi olulisemad teoreetilised piirjooned (tekstide kohasidusus; omailma-perspektiivi arvessevõtt, tekstide, keskkonna ja retseptsiooni omavaheline tihe seos). Esitatud teoreetilist raamistikku rakendatakse kahe juhtumiuuringu juures – Vilsandi-kirjanduse analüüsis (kirjutanud K.T.) ning Alutaguse-mailt pärineva looduskirjanduse eritelus (kirjutanud T.M.). Tekstide ja nende aluseks olnud keskkonna vahelised seosed on sedavõrd tugevad, et tekste võib käsitleda lausa sealsete ökosüsteemide osana.

Artikkel III ("Linnuhääled looduskirjanduses: loomade kommunikatsioon inimeste nägemuses") keskendub linnuhäälte edasi andmisele inimkeele vahenditega. Artiklis antakse sissevaade lindude häälitsustesse loodusteaduslikust vaatevinklist rõhuga häälitsuste struktuuril ning funktsioonidel. Linnulaulul on oluliselt rohkem tähendusi kui inimkõrva esteetiline rõõmustamine. Semiootiline sissevaade linnulaulu kui modelleerivasse süsteemi, mida inimene omakorda kannab üle endale kättesaadavate modelleerivate süsteemide abil, tõstatab küsimuse, kas linnuhäälte kujutamise puhul on tegemist pigem liikidevahelise

kommunikatsiooni või pelgalt inimese autokommunikatsiooniga, mille käigus omistame kuuldule meie jaoks tähendusliku sümboolsete tähenduste kihi.

Artikkel IV, "Nagu kala kuival: kala kujutamine looduskirjanduses" lähtub Thomas A. Sebeoki poolt välja pakutud zoosemiootika uurimisplatvormist, mida omakorda on liikidevahelise kommunikatsiooni uurimiseks kohandatud kujul esitanud Timo Maran. Kuue uurimisküsimuse kaudu eritletakse artiklis erinevate looduskirjanduslike kalamehejuttude näitel, milliseid tähendustasandeid inimese ja kala kommunikatsioonis on autorid oma tekstides edasi andnud. Kahes kardinaalselt erinevas keskkonnas elavate eluvormide puhul, nagu inimesed ja kalad seda on, kujutab looduskirjandus enddast üht väheseid võimalusi teiste liikide omailmas leiduvaid tähendusi – olgu või kohatise metafoorsuse hinnaga – inimeseni tuua.

Artikkel V, "Atlandi heeringas Eestis: rahvusvahelise majanduse ja rahvusliku ideoloogia murdlainetes" keskendub samuti kalade kujutamisele, kuid pisut teise materjali alusel ning teise vaatenurga alt. Kirjutatud koostöös majandusajaloolase Karl Sterniga, keskendub see 1930. aastatel aset leidnud tähelepanuväärsele sündmusele – Eesti heeringalaevastiku asutamisele ning selle esimese püügiretke kajastusele ajakirjanduses ning arhiividokumentides. Kalaliikide retooriline konstrueerimine "omade" ja "võõrastena", mille taustal rulluvad lahti majanduskriisi-aegsed väliskaubandusega seotud kaalutlused, samuti elamuslikud esmakokkupuuted elusate ookeanikaladega, mida kujutab Evald Tammlaan oma "Heeringakirjades", moodustavad kokku äärmiselt huvitava analüüsimaterjali, mille tulemuslikuks mõtestamiseks on siiski vaja eri distsipliine esindavate uurijate koostööd. Selle artikli puhul kerkib esile ka transdistsiplinaarse uurimistöö tegemise kogemus, mida on sissejuhatuses pikemalt käsitletud.

Ka **artikkel VI** pealkirjaga "Botaaniline looduskirjandus: kirjandusökoloogiline analüüs" on distsipliinideülese koostöö vili. Kirjutatud koos botaanik Triin Reitaluga, võtab see vaatluse alla ühe teose eesti looduskirjanduse väheste naisautorite sulest, Haide-Ene Rebassoo "Botaanilisi kilde 17 Hiiumaa suvest" ning käsitleb seda botaanilise looduskirjandusena. Teose näitel rakendatakse looduskirjanduse dünaamilist mudelit. Eraldi tähelepanu pööratakse teadusliku ja kirjandusliku keelekasutuse vaheldumisele teoses, samuti autori isiklike kogemuste järk-järgulisele esiletulekule algul üpris kramplikult "botaanilises" tekstis. Artikkel on kirjutatud rangelt loodusteadusliku teaduskirjutuse konventsioonide kohaselt, mis on samuti väärtuslik, ehkki vahest mitte ilmtingimata järeletegemiseks soovitatav katsetus.

Lisas 1 on töösse koondatud artiklites kasutatud looduskirjandusteoste annoteeritud bibliograafia kronoloogilises järjekorras. Tegu on valikuga minu magistritöös loodud eesti looduskirjanduse korpusest, mida on siinses töös kasutatud analüüsi alusmaterjalina.

Lisas 2 on 2014. aasta kevadel Tartu Ülikooli raamatukogus toimunud raamatunäituse materjalid. Esil oli viis vitriinitäit eesti looduskirjanduse esindusteoseid koos selgitavate saatetekstide ning kogu näitust kokku võtva üldtekstiga, mis on näide transdistsiplinaarse koostöö edukast rakendamisest praktikas.

PUBLICATIONS

I

Tüür, Kadri 2016. Semiotics of textual animal representations.
In: Timo Maran, Morten Tønnessen, Silver Rattasepp (eds.),
Animal Umwelten in a Changing World: Zoosemiotic Perspectives. Tartu Semiotics Library, 18.
Tartu: University of Tartu Press, 222−239.

Semiotics of textual animal representations

Kadri Tüür

Introduction

Art, including literary creation, relies on carefully selected, elaborated and sequenced representations of the reality that is accessible to us, as well as of the imaginary realms that need mediation in some art form, in order to be shared between humans. In the contemporary world, picture-based representations of nature, such as nature documentaries and albums of nature photography, and even cartoons and mobile applications, form a substantially more important way of consuming nature representations than the written word does. However, the focus of the present chapter is on literary representations, particularly on nature writing as a specific type of literary creation where the emphasis is on representations of nature. A number of principles that are employed in nature writing are also applicable to nature representations in other forms.

The present analysis of nature representations is exemplified by the representations of birds in the text "Sounds" by Fred Jüssi, the most well-known Estonian nature writer today. This text has elsewhere been analysed from a rigorously zoosemiotic point of view (Tüür 2009), and contextualised in the historical overview of Estonian nature writing (Maran, Tüür 2001). In the following, the notion of representation is discussed from the semiotic point of view, and it is subsequently associated with the concept of the nature-text as a complex semiotic object that is created in the interaction of natural and cultural elements (as elaborated in Maran 2007a). The underlying questions for the analysis are: How are nature-texts created, and what are the specific strategies of reading them? Where do our umwelten overlap with other species? What epistemological and conceptual difficulties arise when it comes to the mediation of other species' umwelten by means of human sign systems?

1. Nature writing as a hybrid object

As stated in chapter 2 of the present monograph, semiotics is an especially suitable methodology for studying hybrid objects – phenomena that extend beyond one certain domain of human activity, a discipline, or a commonly agreed classification. Our present set of research questions addresses both the cultural and natural phenomena that are expressed in nature writing. Traditionally, nature writing has been addressed in the framework of ecocritical studies where the focus of inquiry has predominantly been on the literary qualities of the texts, such as genre, tropes, metaphors, style, ethical and philosophical content, and so on. But as nature writing contains nature, as the term itself indicates, the 'nature' part also needs to be addressed. In addition to the discussions about what the various cultural meanings of 'nature' are, it is also worthwhile to have a look at how the enormous array of non-human reality is represented in literary form. What are the aspects that have been picked from the environment or from the behaviour of certain species, how have they been rendered in sign systems characteristic of human communication, and how does it all function in different communication situations – both in intra- and in interspecies' ones? In short, nature writing can be explained as a phenomenon in the intersection of the umwelten of different species. Approaching nature writing as a testimony of interspecies' communication may teach us many interesting things about other species, but most importantly about our own.

In order to study nature writing semiotically, we must thus agree that it is a hybrid object that expands beyond the interest sphere of just one discipline, such as literary criticism. Nature writing is actually an exemplary hybrid object *sensu* Bruno Latour (1993), as it challenges and overcomes the typical modern distinctions between culture and nature, between human and other animals, and between objective and subjective.

In the second chapter, three instances are listed where hybrid objects emerge: a) in human–animal communication when the umwelten of different species partly and temporarily overlap; b) when the communicative and interpretative activities take place between an individual body and its endosemiotic processes; and c) between human culture and the natural environment. Nature writing as a hybrid object fits in the first category. It often describes an author's encounters with other species, be these animals, plants, or invertebrates. In order to establish a mutual contact, the umwelten of the participants in the encounter must at least minimally overlap – although in many instances the human counterpart may act as if s/he was the only subject in the encounter. Semiotic analysis helps us to explicate the mechanisms that condition our communication with the rest of the world and, ideally, to make necessary corrections in our species' behaviour according to the research results.

According to the definition of fiction, literary representations do not necessarily have a reference in reality, i.e. in the world accessible to us through

the senses. Nature writing as a specific sub-field of literary creation relies on the representations of the phenomena in our environment. Nature writing in narrow sense is documentary prose that is based on the author's personal, bodily experiences in nature, informed by knowledge of natural history and biology in general, rendered in an elaborate style of writing. In the attempt to define nature writing in a narrow sense for heuristic as well as pragmatic purposes for the present chapter, we can rely on the dynamic model of nature writing as outlined in Tüür 2007. According to this model, nature writing is formed in the overlapping area between belletrist writing, essayist writing, natural history writing, and texts with a pragmatic function, such as handbooks. Nature writing is meant to inform, entertain, and also raise questions in readers about the natural environment that it represents. The question of representation is thus of different importance in the case of nature writing as compared to fiction. Whereas in fiction the 'adequacy' or feasibility of the representation is not of primary importance, it plays a crucial role in nature writing: for example, if nature is represented in a way that is for some reason perceived as inadequate by the readers, the piece of nature writing fails to function. One of the central intentions of a piece of nature writing is to give readers a personally presented, but still correct and up-do-date, knowledge about nature, be it about landscapes or about the other species that we may encounter in the wild. If these reader expectations are not met, the text loses its strength.

In practice, it may sometimes be difficult to draw a border between nature writing and other types of literary creation. American ecocritics have spoken of nature writing as a genre, but this is perhaps true only if we understand 'genre' as a conglomeration of the readers' expectations, just as Paul Cobley (2001) has explained it in his article about genres in contemporary media. Finch and Elder in their introduction to the "Norton Book of Nature Writing" discuss the problem of discriminating between what is nature writing and what is fiction (Finch, Elder 2002: 27). If we think of genre in structuralist terms, as a conventional way of structuring one's text and employing certain literary tropes, the variety within nature writing appears to be wider than a rigid definition would permit. Nature writing serves better as a heuristic device that helps to find and focus on the most exemplary texts that have the greatest potential to yield interesting results in ecosemiotic analysis.

In a wide sense, all writing has a component of nature writing because it is always based on human experiences of our perceived reality – even if reality is defamiliarised in literary creation, we are still able to recognise the defamiliarisation on the basis of our own environmental experiences. Also the resources necessary for writing always come from nature, whether we recognise it or not.

As a sub-field of literary creation, nature writing has the requirement that it should be written down in an elaborate style, and it most often uses metaphors and literary tropes as a crucial constitutive element of the story. Presumably this is also what differentiates nature writing from a purely scientific text – albeit not

entirely, because most research papers rely on metaphoric expression as much as any other human verbalisation. So we can conclude that nature writing reaches beyond the limits of literary creation into the realms of science, natural history, animal biology, autobiography, and so on. In order to bring all these varied aspects together into one coherent analysis, the understanding of nature writing as a hybrid object enabling semiotic study can be applied.

2. Nature-text: a reading

Each object, be it hybrid or "pure", requires a systematised approach in order to be successfully analysed. One suitable distinction here is between denotative and connotative meaning as outlined by Roland Barthes (2004). In the case of nature writing, denotative meanings are tied to the biological knowledge of the species, environments and communicative situations that are represented in a text of nature writing, whereas connotative meanings tie the text to its cultural context and pre-conditions, i.e. to the (often stereotypical) ideas about the conventions of nature representation that the reading public may have.

Another systematising tool that is used here is the notion of nature-text. Timo Maran (2007a: 269–294), combining the theories of the Tartu-Moscow school of cultural semiotics, zoosemiotics as devised by Thomas A. Sebeok, and ecosemiotics as proposed by Kalevi Kull, has put forth the model of nature-text that embraces several representational aspects of a text. The model is presented in Fig 1.

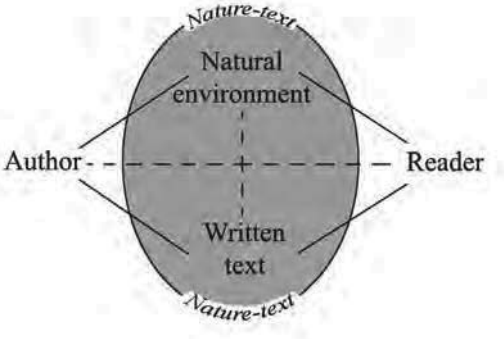

Figure 1. Components and interrelations in the complex of nature-text, from Maran 2007a.

The complex phenomenon of the nature-text is comprised of written text and the natural environment it relies upon. In the case of nature writing, the text itself is a result of an author's personal experience (hike, stay, observation) of

some particular natural place or species. As such, it is based on the natural environment and refers back to it. As a rule, the experience determines the structure of the text in some way – whether it is a ramble, a hunting story, a contemplation of magnificent landscapes and scenery, or an examination of the minute details of the ecosystem of the place visited. This way, the text and the environment are mutually embedded in each other. A nature-text, according to this scheme, is created only if an author has first-hand experience of a particular natural environment and writes about his/her experience, usually in the form of non-fiction. The fourth important participant in the making of a nature-text is the reader. The nature-text works better if the reader, too, has had a first-hand experience of the natural environment that is represented in the written text. In addition to a familiarity with the environment, s/he should also know the genre conventions related to a non-fictional nature essay (nature writing). In Estonian culture, it is often the case that a reader also knows the writer, either personally (by having been hiking in the same areas, for example) or as a public media figure (like Fred Jüssi or Jaan Tätte). In this way, the author's position and activities beyond the text of nature writing contribute an extra layer to the nature-text and to the reader's interpretation of it. A nature-text only works properly when all of its four components are included in the process of interpretation in an interrelated manner.

As Maran points out, contextuality is one of the central characteristics of nature writing (Maran 2007a: 273). That is, connotative meanings play an important role in the interpretation process. In fiction studies, reading a work of literature against the background of its immediate environment of writing is not considered to be of primary importance for understanding it. Such a necessity may arise only occasionally, especially if an evident discrepancy occurs between the text and the environment it refers to. Only when the text reaches people who have a personal experience of the landscape may they notice the misplaced representation of nature that is based on a "falsely believed" assumption by the author, as well as by her earlier readers. The representations based on the actual natural environment play an important role not only in nature writing but also in fiction. In regard to connotative meanings and regarding the readers' perceptions of what is a truthful representation and what is not, it should be noted that quite often cultural conventions play their role in conditioning the perception. It is not always denotative aptness that makes a representation viable; it may also be the connotative adherence to the cultural norms of representation, and the reader's ability to recognise these.

As Maran (2007a: 271) has noted, both semiotics and ecology rely on research methods that are grounded in contextuality: each individual phenomenon acquires significance in the context where it functionally belongs. Semiotic analysis as such must take into account the contextuality of any communication act, including written communication in an elaborate form, i.e. literary creation.

A literary work makes use of the external world in a similar manner as non-fiction. Representations of the environment in written text make sense insofar as we are able to relate these to our personal experiences as readers.

It is instructive to take Fred Jüssi's piece of nature writing entitled "Sounds" (Jüssi 1986: 27–28)[1] and analyse it as a nature-text. This should give an idea of the multi-faceted nature of nature representations in a literary text, and also show that nature writing is by no means a "simpler" object for critical studies than a piece of fiction.

Jüssi's text is set on an islet in the Baltic Sea. The time frame for the piece is an evening in early spring. The year of writing, 1976, is added to the text. The author observes the sounds and activities of several bird species: goosanders, long-tailed ducks, swans, mallards, eiders, goldeneyes, and a blackbird. Two thoughts concerning the specifically human umwelt are woven into the discussion of the birds' audible activities: one about the tacit knowledge of coastal people, and another one about the sense of longing for home that the sound of a goldeneye's wingbeat may elicit. That is more or less all the information that we can obtain from the text itself. In order to understand the poetics of the text more deeply, contextual information is needed.

Let's start with the location. The name of the islet is not mentioned in the text. The only geographical reference is encountered in the middle section of the essay, "Swans are trumpeting in Õunaku bay". Õunaku is a small bay on the southeastern coast of Hiiumaa island. It is lined by a number of islets belonging to Moonsund Archipelago, but the one that Jüssi is standing on in that particular occasion must be Saarnaki. Its location is suitable for observing all the bird species mentioned in the text. Swans prefer to linger near shores when resting where they are able to grasp food from the seabed in shallow water. A personal experience of visiting these islets also helps to determine the possible physical and auditive landscapes – Hanikatsi is too far off in the sea for a human to be able to hear the swans near the shore in Õunaku bay (see Fig 2).

[1] Excerpts from the same text were used as a source for the semiotic study of sound representations in the article "Bird sounds in nature writing" by the author of the current chapter (see Tüür 2009).

Figure 2. Map of Õunaku bay (Source: Estonian Land Board).

Hanikatsi is the only possible alternative to Saarnaki as the location of the piece. A well and a house, referring to permanent human habitation, and connected with a footpath that, in turn, indicates recent and regular use, are mentioned: the writer describes his brief halt on his way from the house to the well to fetch water. Of the smaller islets around Õunaku bay, only Saarnaki (1564–1973) and Hanikatsi (1623–1965) have had permanent inhabitation, including farmhouses.[2] Information about the inhabitation of the islets can be obtained from old maps and archival documents, as well as from other books of nature writing (Rebassoo 1972; Leito 1984). The well of Saarnaki has also been mentioned as an important element of the islescape by Tiit Leito, a nature writer and a long-time head of the islets' nature reserve. Leito writes in his book "Four Seasons on the Islets" that the inhabitants of Saarnaki could tell the approaching winter by observing their well: when it filled up with water to its upper rim, ice and snow were about to arrive (Leito 1984: 5).

Also Jüssi's passage about the environmental wisdom of coastal people as contrasted with the atomic, factual knowledge of scientists can be associated with the former inhabitants of the islet. As we can infer from the dates mentioned above, Jüssi wrote his piece at a time when a centuries-long epoch of permanent human habitation on the small islets in the Baltic Sea had just come to its end. Three years prior to writing "Sounds", the last man who lived on Saarnaki, Peeter

[2] Information for the visitors of the Hiiumaa islet protection area (in Estonian): http://www.keskkonnaamet.ee/hiiu/kulastajale/kultuuriparand (21.11.2015).

Saarnak, had drowned in a rowing boat accident on the stormy sea because Soviet authorities had banned the usage of motor boats and sailboats by coastal people (Klaas 2007: 7). Thus the reference to the vanishing wisdom of coastal people in this piece indirectly served as a comment about the political regulations that devastated the local life.

The text reveals that Jüssi and his companions have arrived at the islet with the aim of setting up nesting boxes for goosanders. This is another minute but important detail that helps to determine the location. It cannot be found in written sources but only by a personal observation on the islets – on Hanikatsi, the nests for goosanders have been established in hollow trees instead of nest boxes. The described activity is a manifestation of an effort to keep up the ancient practices of coastal folks. Collecting waterfowl eggs to enrich one's diet in spring is a practice that has been known to all Finno-Ugric people, and that thus has to be a vernacular habit thousands of years old (Mäger 1994: 274). However, the people who have set out to place the nest boxes in "Sounds" are modern scientists, not traditional dwellers, and thus their activities on the islet can be regarded as a nostalgic attempt to re-enact the past. The result is but a copy of the vanishing world with no practical purpose. As Leito later states about their maintenance activities on Saarnaki in a very self-critical manner,

> We pitied the dilapidating houses on Saarnaki and so we decided to restore them. We made new roofs, patched the walls, set in doors and windows, cleaned the well and even mowed the yards. Now, looking at the windows with no glow inside, I can't get rid of the feeling that I am standing among pieces of taxidermy. Yes, we did our best to make everything beautiful, but we could not provide the most important – the living soul. (Leito 1984: 26)

The time frame for the piece could be estimated to last about 5 minutes. On a crisp March/April evening, the average temperature is around 3 degrees C, and even colder in coastal areas where the sea cools off the land more quickly.[3] On the basis of years-long personal experience, I can say that standing still for 5 minutes in such conditions is quite enough, even if the observations of bird behaviour are as thrilling as they get. Stopping on the way to the well also hints that the author most probably stepped out of the house *ad hoc*, with no cap or gloves, and the chill would catch him quickly. No bodily sensations of the author are directly mentioned in this particular text, although they have been rendered elsewhere in his work.

We can also determine the time and the weather conditions at the time of writing the text on the basis of the bird behaviour that is mentioned. Goosanders start nesting shortly after the breaking up of ice (Renno 1993: 53). Swans, according to the Collins bird guide, withstand the rather harsh conditions "closely following

[3] See the observation records at http://seire.keskkonnainfo.ee/.

[the] retreat of ice in spring" in their migration (Collins 2001: 38), arriving in Estonia in March (Renno 1993: 37). As we learn from the text, the swans had migrated in the beginning of March (i.e. the ice would have to break also around that time). Therefore, it is probable that the piece had been written at the end of March, 1976. Leito (1984: 19) writes that April makes the sea ice unreliable, but as Jüssi remarks in his text that the ice had retreated extraordinarily early that year, the time can be settled to March. The appearance of the blackbird confirms this opinion: according to Collins, the Northern European population of blackbirds is migratory, returning from Western Europe usually in March or April (Collins 2001: 276). The blackbird is referred to as a 'forest bird', in contrast to the waterfowl whose sounds have been observed earlier. There are some big ash trees around the houses on Saarnaki, and there is a remarkable group of lindens in the middle of the islet. It is true that the habitat of the blackbird is cardinally different from that of the waterfowl.

Another contrast between the blackbird and the waterfowl lies in the intensity of their sound-making: whereas the blackbird's call is clearly territorial, the previously noted sounds are just part of the birds' movement (such as swishing and splashing) or are used to keep the flock together (such as the trumpeting and owdelee-sounds). The blackbird is characterised as a noisy bird, and its call is described as "a series of metallic, high 'pli-pli-pli-pli-pli-...', which [...] turn into a crescendo" (Collins 2001: 276) which the bird often emits prior to going to roost. In the text, it is as if the blackbird's sound intrudes the islet soundscape where the human listener is immersed, abruptly ending the brief moment of contemplation among the less intrusive sounds from the sea. Such contrast is without a doubt an essential part of the artistic composition of the essay; it starts out smoothly, meditatively, and comes to a sudden end. To take the parallel even further, the text's composition can also be interpreted as a metaphorical parallel to the human history on the islet: it has begun slowly, in close association with the sea, and it suddenly ends because of intense, land-bound regulations.

In conclusion, what we can see on the basis of this brief analysis of the piece of nature writing as a nature-text is that the text itself, its composition, and its natural and historical context make an intrinsically interwoven complex of meanings. In order to understand it, both denotative and connotative meanings have to be taken into account. In the case of a nature-text, connotative meanings are of primary importance: knowledge about the history of the islet's inhabitation by humans helps us to understand better the disposition of the story, as well as the possible meanings and emotional weight of the human actions referred to in it. Connotative meanings help us to specify the location and the time frame – and also the possible climatic conditions and the circumstances of writing, as well as of the real event that the story is based upon. Contextualisation opens up whole new vistas of interpretation for a reader who is him- or herself engaged in the formation of the particular nature-text. Moreover, the personal experiences

of the writer, as well as of the reader, and the implicit intertextual references to the works of other authors with similar experiences from the same area help remarkably in detecting the hidden layers of meaning. In the case of nature writing, the verbal text and the natural-cultural environment it represents evolve as a representational complex. A successful interpretation of such a hybrid object requires knowledge of both from the reader. Part of the knowledge can indeed be obtained by visiting the described places and getting familiar with their natural features and inhabitants, either prior to or after reading a piece of nature writing about that particular location.

3. Overlapping umwelten

In the present sub-chapter, umwelt analysis is applied from the three basic methodological approaches in zoosemiotic research, as outlined in chapter 2. In the case of nature writing, instances of biocommunication and evidence about spatial organisation of some species may also occur, but the most fruitful approach in analysing the textual representations of animals still proves to be umwelt analysis. According to the definition derived on the basis of the works of Jakob von Uexküll, an umwelt is composed of all the meaning relations in the perception-based and in the action-based functional circles of an animal. In order to be able to render another species' umwelt in writing, a human observer must have at least partly the same perceptual capacities that the animal has, as well as some knowledge of the underlying biology that helps us to create a contact zone between different species. It must be kept in mind that the contact zone is not necessarily mutual in all cases, and not necessarily in favour of the human counterpart, either. In the course of an encounter, the observer's and the observee's umwelten usually overlap to a degree – that is, they perceive each other and often even establish a contact that is meaningful for all the engaged parties.

Knowledge of the structure of the umwelten of the other living beings, who are part of a piece of nature writing, is connected with the denotative meanings of the nature-text. In order to be able to estimate how the specific traits of other animals' umwelten are represented in the text, what features have been emphasised, and what features have deliberately been left unaddressed, we must have some denotative knowledge of the basic biology of the species that we encounter in a nature-text.

In order to be more precise in estimating the nature of the inter-species' contacts, it is necessary to make a distinction between communication and signification (Martinelli 2007: 28). The former describes a situation where there is an intentional sender involved, and both sender and receiver share a considerable amount of the principles determining the form, the rules of codification, and the context of the messages. This sort of interaction is usual in intraspecific communication,

such as human language. In the case of signification, the semiosis resembles the way the inanimate environment is interpreted by a living creature (Maran 2007b: 42; Nöth 2001: 72). In nature writing, instances of communication as well as of signification can be found in the descriptions of human encounters with other animals. Making a distinction between communication and signification may be subject to interpretations and intentions of the receiver to a considerable degree. For example, if a representative of another species is not vitally interested in its human observers, it may happen that it has no intention for any interaction with humans whatsoever.

However, humans easily tend to interpret natural phenomena as symbolic communication on one hand or, on the other extreme, as unintentional signals resembling the ones present in inanimate nature. This raises a load of ethical questions regarding the proper relationship of humans with other species. What are the consequences if an animal's behaviour elicits exaggerated or even inadequate reactions in the human umwelt? For example, misinterpretation of a "cute" little animal, such as a colourful but poisonous frog, may be dangerous or even lethal to either of the participants in such communication instances. There are not many descriptions of such misguided communication in Estonian nature writing, but the potential for such events is implicitly there. Jüssi describes an encounter with a field mouse in one of his texts:

> Then comes a mouse. It has slipped in from some crack in the wall, it has climbed on the table, and it is now munching away with my bread in the full peace of mind. It pays no heed to me. When I touch the silky fur on the back of the mouse with my finger, it rises to its hind paws and sniffs my hand. I have a somewhat uneasy feeling – my fingertips smell of smoky lard and pine sap, and how do I know that it is not about to have a bite of me with its needle-sharp little teeth? (Jüssi 1986: 41)

Here the connection between a human and a mouse is established on the basis of one of the most inevitable needs in all animals – the need for food. The olfactory aspects of the contact are also shared, although the author hesitates about the possible semantic connotations the smells may have in the mouse's umwelt, and about what action they may elicit in it. The third layer where the human and animal umwelten overlap is the realm of tactile sensations: the mouse feels and reacts to the human touch, even though this may seem an inadequate reaction, as we are stereotypically used to thinking of wild animals as having a fear and flight reaction to human presence. Therefore, the human also anticipates the mouse's touch and thinks of the little creature's teeth as the organ of encounter – thus, in turn, fastening the stereotypical perception of any wild animal as having dangerous teeth, by which it makes its contacts with the rest of the world. In addition to knowledge of animal biology, a number of connotative, culture-induced ideas seep through the textual tissue. We may thus conclude that human

interpretation of animal umwelten is inevitably marked by our human symbolic capacities, by cultural connotative meanings, and by the tendency to interpret encounters with other species as necessarily communicative situations.

Uexküll has shown that thanks to the functional cycle in animal umwelten, animals are generally able to move away from the conditions that are not suitable for their life at a considerable speed, picking the direction of movement more or less at will. They can also actively seek to alter the environment or its features in order to make them more suitable for their life needs. Even if the alterations in the environment are minor, they can be perceived as huge by some other species. For example, beavers construct dams on streams and rivulets in order to have dens and favourable feeding conditions. Humans may perceive this as a drastic and infavourable intrusion into the landscape, as the life-related activities of beavers result in floods, in irrigation or amelioration ditches being stuck and growing over with bush, in the decreasing of fish in streams, and so on. Then verbal representations (including nature writing) of beavers and their activities come to play an important role in how such different interests of the species with overlapping umwelten are perceived, represented, and negotiated.

We have different possibilities for rendering the animal's perspective in verbal representations – as this way of mediating the environment is something alien to species other than humans. One option is to anthropomorphise the animals: to represent them as if talking to each other, reasoning about their behaviour; to depict them having emotions similar to those of humans, such as love, rage, fear, attachment; etc. Such an approach often results in children's stories that have been criticised for their low level of sensitivity towards the genuinely species-specific umwelt. The other option is to try to explain the animals' behaviour, relying strictly on scientific data about animal ecology, ethology, and zoology. It requires special skill to convert the quantitative data obtained by the methods of hard science into an eloquent story that the readers would be keen to follow until its end.

The connecting point that ties together humans' and other animals' umwelten is indeed the life cycle: each individual is born (or hatched), it matures, moves about, mates, produces some offspring, and finally dies. All of these stages of life are observable in most vertebrates, thus providing a nice common ground for drawing affective parallels between the lives of different species. Kinship relations and life cycles are universally present across species, providing a "natural" structural basis for nature writing that features animals and animal lives. Thus it can be claimed that animal representations based on a featured animal's life cycle are relatively easily accessible to human readers who can in this way find similarities with their own umwelt. This fosters sympathy towards other species, which is indeed one of the aims of nature writing, along with giving information about our fellow species' lives, as they might see it themselves.

The life cycles of humans and other animals are organised in a syntactically similar manner – i.e., the sequence of life episodes is more or less the same across a wide range of species. This fact gives us reason to make a brief excurse into the phenomenon of biotranslation here. The notion of bio-translation has been outlined by Kalevi Kull and Peeter Torop (2003) in order to analyse the different translation mechanisms that may occur in literary texts, and to take into account the possible instances of translation between umwelten. In their article, Kull and Torop bring examples mostly from molecular level and from the translation mechanisms that occur in DNA. It is challenging to think about whether, and in what conditions, inter-species communication could be regarded as biotranslation. We can differentiate between three types of translation: 1) linguistic translation, or a translation from one verbal language to another; 2) intersemiotic translation, e.g. in combining verbal text and photographs that are mutually complementary; 3) biotranslation, when the umwelt of another species is mediated to human readers in the form of literature or any other communication type characteristic of the human species.

As Kull and Torop explain, translation requires two distinguishable sign systems and a successful transmission of meaning from one to the other. Biotranslation could thus be regarded as a transmission between umwelten. In the case of a regular translation, we can speak of the structure of the text, of its poetic function, and of the syntax as one of its constituting values. Kull and Torop argue in their article that for other animals, certain rhythmically repeated patterns of movement may serve as proto-syntax. Thus translation of an animal's life events into a human narrative also emerges as a technical, as well as semiotic, problem: could we say that representing an animal's life cycle by human means, such as literature, sound recording, or film, is bio-translation? This question is intriguing, but the discussion would require a separate article, and must therefore remain only noted here. The present article and the umwelt analysis presented in the following serve as a preparation towards a more elaborate study of the question of biotranslation in the future.

We as humans, especially in our written communication, cannot deny our perspective outside the limits of the umwelt of our own species: we always perceive and conceptualise the world around us as the representatives of the human species. Literary representation, however, enables us to create possible worlds and to position ourselves as if in other umwelten, without actually having to shapeshift. This is indeed one of the indisputable strengths of verbal representation. In comparison to photographic representation that inevitably features the technologically mediated human gaze, nature writing may be able to conceal the human subjectivity by bringing to the fore the features defining the umwelt of the "target species". A story can be narrated from the point of view of another species, or it can be narrated neutrally, describing the life events of some representatives of other species as if from the point of view of an outside observer.

Employing the point of view of an omniscient narrator is also a possibility. All of these choices have been used in the tradition of nature writing, both Estonian and international.

In order to see how the overlappings of human and bird umwelten have been used in Estonian nature writing, let us turn to Fred Jüssi's piece "Sounds" as the model source again. The title suggests that the piece focuses on soundscapes and on auditive sensations. These are described as experienced by the author while standing outside of a house on a small islet on the Moonsund Archipelago. It is early spring, and a number of waterfowl and migratory birds are audially observed. When people tell about their encounters with birds, these tend to be visual experiences. Visual perception dominates other senses that bring our brains information from the environment. Focusing on sounds in the present text is a manifest shift to another perception channel, thus perhaps even creating some sense of unfamiliarity in readers. For birds of many species, auditive communication is much more important than the visual. By choosing to focus on sounds, Jüssi steps out of his own human 'comfort zone' and moves closer to the umwelt of birds for whom sound-based communication is of vital importance. The first sound that the text mentions is the distant call of long-tailed ducks in a vernacular verbal rendering: "Aa au-li, aa au-li" (Jüssi 1986: 27) or "Ow ow-owdelee, ow ow-owdelee" in translation (as rendered in Collins 2001: 64). This call has been poeticised in several Estonian literary works. A distant and nice sounding call from the open seas easily reaches the position of a symbol. In "Sounds", it is followed by an explanation: "The long-tailed ducks are migrating". This shifts focus to birds and directs the thoughts of the reader to the situation of migrating and to its possible meanings in the birds' umwelt. It does not yet suggest that the sound has symbolic qualities for the human listener, but it prepares the reader for the passage towards the end of the text, which is about the "sound of longing" created by the swishing sound of male goldeneye's wings.

The verb used to characterise the sound of swans in the Estonian text, "pasundavad", is not exactly the most poetic word one could think of (and thus is hard to translate, even though "whooping" is a taxonomically correct choice). It suggests a loud, blaring and slightly annoying sound to the human ear. The loud sounds of a flock are contrasted to a lone pair of whooper swans, "quietly minding their own business" by the shore. However, the importance of sound in flock behaviour is recognised.

Jüssi also discusses the call of male eiders. In the story, that call is missing, thus acting as a zero sign in Sebeok's sense (1994: 18) – that is, signifying by its very absence. As the author admits that he does not know whether male eiders would utter the call in the evening or not, he indicates that his knowledge of bird behaviour and about the place of certain sounds in an eider's umwelt is not without certain gaps. Still, the distinction between flock calls and mate calls, as well as the territorial call of the blackbird at the end of the text, show that the

author has remarkable knowledge of the possible repertoire of bird sounds and that he can associate them with different modes of behaviour. Humans, too, use different sounds and verbalisations for analogous functions: to keep a group together and to express solidarity, to bond with their family members, and to declare one's territorial rights. In addition to sounds, humans have a number of other very elaborate sign systems for the same functions, for example banners, coats of arms, border demarcations and military equipment for the expression of one's territoriality. The sign systems used are different, but the basic needs – social, individual, territorial – are shared across umwelten.

Jüssi mentions the holes dug into the coastal mud by swans in search of food. This observation requires knowledge about waterbird biology and their feeding habits; otherwise the holes in the mud would remain cryptic signs. Although the author himself does not share this food searching strategy with swans, he is able to recognise and relate to it. Here the overlapping of umwelten does not happen on the processual level of the food search, but rather on the general level – all species must eat. That connects humans to swans and to other waterfowl quite effectively. This example can also be conceptualised as an instance enabling biotranslation: it is an inevitable function of life that is not missing from any vertebrate umwelt (things may be different in the case of some insects that pass metamorphic stages during their life cycle).

At the end of the piece, it is the territorial call of a blackbird that serves as a discrepant sound and awakes the human listener from his reveries. To tell the difference between the sounds of waterfowl and the call of a forest bird requires some denotative knowledge. For an ornithologically ignorant listener or reader, 'bird sounds' may be all the same. Here, Jüssi juxtaposes the sounds of water birds with the call of a song bird and, as a result, is brought back by surprise to his own umwelt and to the meaningful behaviour valued in the human world: "Right, I was on my way to the well to fetch water...!" The activities performed in the umwelten of different species may serve different purposes, but the analysis hopefully managed to demonstrate that there are overlappings and contact zones in the umwelten of different species that enable us to relate to each other over the limits of species. Stereotypical perceptions possessed by humans may indeed hinder the mutual communication, but nature writing at its best suggests that we are able to overcome this. Semiotic analysis of nature writing contributes to the creation of this understanding.

Conclusion

The present chapter focused on animal representations in nature writing and on their analysis with the help of tools provided by the semiotic approach. 'Representation' is a notion that is often used but seldom conceptualised. Here representations are understood as non-human environments and umwelten

that are perceived from within a human umwelt and rendered by means of sign systems that are available for humans' intra-specific communication, such as literature, film, and photo. Unlike in fiction, the reality that is modelled into a cultural text plays an important role in understanding these texts. Therefore, we can say that nature writing is a hybrid object: it extends beyond the scope of one individual discipline, such as literary criticism or biology studies, and challenges their limits. Semiotic methodology provides help in overcoming this tension. It suggests looking at nature writing as a communicative device that functions between humans in our species' umwelt, and that also gives us insights into the umwelten of other animals. By regarding nature writing as involving a nature-text that brings together the denotative and connotative knowledge about the represented reality and species, a semiotic approach provides tools for analysing it in a systematic manner. The central notion in the biosemiotic analysis of nature writing is definitely umwelt – the species-specific way of perceiving the environment and of relating to it through actions. When the umwelten of different species overlap, a contact zone is created and a possibility for meaningful communication and perhaps even for bio-translation arises.

Human texts and our perceptions based on them affect real animals, and therefore we should be careful in producing nature writing as well as in our critical examination of nature writing. Jüssi's writings are a good example that a wide array of non-human species can be represented not only by rendering their umwelten correctly, but also in a cordial manner.

Acknowledgements

The research for this chapter was supported by the Norway Financial Mechanism 2009–2014 (project contract EMP151).

References

Barthes, Roland 2004. *Mütoloogiad.* (Lepikult, Mirjam; Ojamaa, Ott, trans.) Tallinn: Varrak.

Cobley, Paul 2001. Analysing narrative genres. *Sign Systems Studies* 29(2): 479–502.

Collins 2001 = Mullarney, Killian; Svensson, Lars; Zetterström, Dan; Grant, Peter J. *Bird Guide*. London: HarperCollins.

Finch, Robert; Elder, John 2002. Introduction to the 1990 Norton Book of Nature Writing. In: Finch, Robert; Elder, John (eds.), *Nature Writing: The Tradition in English*. New York: W. W. Norton & Company, 21–31.

Jüssi, Fred 1986. Hääled. In: *Jäälõhkuja.* Tallinn: Valgus.

Klaas, Eva 2007. Saarnaki võlub vaikuse ja ilusa loodusega. *Virumaa Teataja,* 18.VIII, 7.

Kull, Kalevi; Torop, Peeter 2003. Biotranslation: Translation between umwelten. In: Petrilli, Susan (ed.), *Translation Translation.* (Approaches to Translation Studies 21.) Amsterdam: Rodopi.

Latour, Bruno 1993. *We Have Never Been Modern.* Cambridge, Massachusetts: Harvard University Press.

Leito, Tiit 1984. *Aastaring laidudel*. Tallinn: Valgus.

Maran, Timo 2007a. Towards an integrated methodology of ecosemiotics: the concept of nature-text. *Sign Systems Studies* 35.1/2: 269–294.

– 2007b. Liikidevaheline kommunikatsioon ja Thomas A. Sebeoki uurimisplatvorm. In: Rattasepp, Silver; Maran, Timo (eds.), *Kommunikatsiooni teooria.* (Schola Biotheoretica XXXIII.) Tartu: Eesti Looduseuurijate Selts, 36–47.

Maran, Timo; Tüür, Kadri 2001. On Estonian nature writing. *ELM: Estonian Literary Magazine* 13: 4–10.

Martinelli, Dario 2007. *Zoosemiotics: Proposals for a Handbook*. Helsinki-Imatra: ISI.

Mäger, Mart 1994. *Linnud rahva keeles ja meeles.* Tallinn: Koolibri.

Nöth, Winfried 2001. Ecosemiotics and the semiotics of nature. *Sign Systems Studies* 29(1): 71–81.

Rebassoo, Haide-Ene 1972. *Laidude raamat.* Tallinn: Valgus.

Renno, Olav (ed.) 1993. *Eesti linnuatlas.* Tallinn: Valgus.

Sebeok, Thomas A. 1994. *Signs: An Introduction to Semiotics*. Toronto and Buffalo: University of Toronto Press.

Tüür, Kadri 2007. Looduskirjanduse määratlus. *Acta Semiotica Estica* 4: 73–96.

– 2009. Bird sounds in nature writing: human perspective on animal communication. *Sign Systems Studies* 37(3/4): 226–255.

Internet sources

Environmental Board – keskkonnaamet.ee

Environmental Monitoring Board – seire.keskkonnainfo.ee

Appendix

Sounds

Fred Jüssi

I stop on my way to the well to listen to what the spring sea has to tell.

It is evening, the sun has just set. The sea fell quiet a few of hours ago, and in the light of dusk only a soft ripple is visible on its surface. The wind is about to turn, it seems.

I haven't been to the islets this early in the spring before. At this time of the year the sea is usually still full of ice, but this year it is different. Yesterday we launched the boat, and today we are already on an islet to put up new nesting boxes for goosanders. And now it is evening and from the sea the sounds of the birds waft my path to the well.

Ow ow-owdelee, ow ow-owdelee. The long-tailed ducks are migrating. There are many of them on the sea. Earlier during the day they flew off in flocks at the approaching boat, but the time of massive migration is still ahead.

Swans are whooping in Õunaku bay. The swans came and left at the beginning of March, there are only a few of them now. When sea water was low, I went to the shore to see their stopover sites. The mud was full of smaller and bigger holes, which the swans had hollowed there in search for food. Right here on the coast there's a pair of whooper swans at the moment, but making no sound – they are quietly minding their own business.

Mallards quack and splash about by the reed bed. No sound of a male eider. I can't recall if I have ever heard a male eider's call in the evening at all. In the morning, and during the daytime, yes, but not in the evening. I don't remember. I should remember to try and listen to it in the future. In a sense, fishermen have a much better knowledge of the sea than biologists. They have more observations. A researcher notes an observation and then looks it up in the notebook if necessary. Coastal folks do not walk around with notebooks and binoculars, but if you have a question, they rummage out their wisdom in response. This wisdom has seeped into them over the years lived on the sea and at the seashore, and is always close at hand.

With their wings whistling, a small flock of goldeneyes flies across the islet. Here one gets used to the whistling of the goldeneyes, one no longer notices it, but in the inland woods and moors it is one of the most beautiful sounds in a springtime night. While the scream of a fox in a February night makes one feel like responding to the call, the whistling of goldeneye wings conceals the haste of someone driven by a longing for home. At least that is how it has seemed to me during nights spent in the woods by the campfire.

All of a sudden, a blackbird starts singing in an ash tree behind the house. The voice of a forest bird wakes me from my thoughts. Right, I was on my way to the well to fetch water...!

II

Maran, Timo; Tüür, Kadri 2017. From birds and trees to texts: An ecosemiotic look at Estonian nature writing. In: John Parham, Louise Westling (eds.), *A Global History of Literature and the Environment*. Cambridge: Cambridge University Press, 286−300.

CHAPTER 18

From Birds and Trees to Texts: An Ecosemiotic Look at Estonian Nature Writing

Timo Maran and Kadri Tüür

Introduction

Estonia is a relatively small patch of land by the Baltic Sea, in the temperate climate zone where forest is the climax ecosystem – that is, if nature is left to itself, sooner or later the result will be dense coniferous forest. As in the rest of Northern Europe, the human impact on local landscapes has been moderate but persistent over the past millennium, resulting in a range of semi-natural communities, such as wooded meadows, alvars, coastal meadows, floodplain meadows, broad-leaved forests, etc. Semi-natural communities are developed and maintained in close co-operation between humans and domesticated animals for whom these areas serve as pasture and provide a source of fodder. There are also relatively wild areas, such as sea coasts, bogs, mires and old growth forests in Estonia that have experienced only very mild human impact over the centuries. These landscapes have predominantly been shaped by the forces of nature, but even here there is always also both a human and animal influence upon them.

Time-wise, the tradition of Estonian-language nature writing can be traced back to the educational literature of the late eighteenth and early nineteenth centuries. In the early nineteenth century, reading material about natural wonders and phenomena would be published in calendars and periodicals on a regular basis. During the national awakening movement in the second half of that century, during which time Estonian civil society emerged, binding the nation together using common topics, motifs and rhetorical devices became increasingly important. Estonian soil and the local people's creative connection with it by means of agricultural activities was emphasised in poetry, prose and instructional writing. As Estonia became an independent state in 1918, the sedentary country people would need ever more information about their homeland, its different parts, and valuable characteristics by means of the printed word that would

provide knowledge about their native land and inspire love of the country. Nature writing played an indispensable part in this process. During the third decade of the twentieth century a wave of nature writing appeared that consisted of travelogues and hiking memoirs, as well as almanacs dedicated to introducing areas of interest to domestic tourism. It involved nature writing in its most characteristic forms, such as documentary prose, autobiographical essays, and travel stories. The core of Estonian nature writing from the 1920s and 1930s consists of nature observations with an emphasis on plants and birds.

Estonian nature writing did not, however, evolve in an empty space. During the first decades of the twentieth century a substantial amount of high-quality nature writing was translated from Russian (Dmitri Kaigorodov, Valerian Lunkevich, Vitali Bianki), German (Carl Ewald, Herman Löns, Manfred Kyber, Hermann Wagner), Swedish (Selma Lagerlöf, Bengt Berg) and English (Ernest Seton-Thompson, Jack London). Educated Estonians of the time could read and speak both German (the language of the local nobility) and Russian (the official language of the czarist state) and thus influences from cultures based on these languages were presumably significantly stronger than actually reflected in the translations. A case in point is Alfred Edmund Brehm whose *A Life of Animals* was available in German and in Russian, but was never translated into Estonian. Regardless, a number of Estonian books of nature writing (by Karl August Hindrey, Johannes Käis, as well as illustrations in an Estonian translation of Kaigorodov) refer to Brehm as a source of substantial influence.

World War II caused a rupture in Estonian culture, including Estonian nature writing, with the incorporation of Estonia into the USSR between 1940 and 1991. After the war, Estonian refugees in the West compiled books of landscape photography to commemorate their lost homeland. In Estonia, people were denied access to many previously significant areas of nature, such as the coast (including Vilsandi) that now constituted the westernmost border zone of the USSR, the bogs and forests (including Alutaguse), which became places of underground resistance against the Soviet occupation, and former holiday destinations that were turned into oil shale mines or grounds for military practice. Still, the pre-war tradition of Estonian nature writing continued when the collection *Pictures and Sounds from the Nature of Homeland* by Johannes Piiper, Professor of Zoology at the University of Tartu, originally published in 1935, was re-issued in 1948.[1] Other authors who continued publishing nature writing and animal stories were Kustas Põldmaa, Eerik Kumari and Richard Roht.

In 1957, the Nature Protection Act was passed in Estonia, pioneering the process for the whole USSR. As new nature protection areas were established, books describing places of natural beauty, and their natural and cultural history, regained their status. In the 1970s a new generation of nature essayists emerged that included Fred Jüssi and Edgar Kask. In the wake of the translation of Rachel Carson's *Silent Spring* by Ain Raitviir into Estonian in 1968, a new focus appeared in Estonian nature writing, a shift from local, small-scale protection of aesthetically pleasing objects to the perception of a looming global environmental crisis, and contemporary human impact on large ecosystems. The substantial core of the tradition of Estonian nature writing, however, remained bound to aesthetic natural objects and valued local ecosystems. Indeed, most critical reflections about the human impact on natural environments stemmed from such experiences of local nature.

In Estonian nature writing, certain areas of the country appear to have been particularly represented in these texts. We have chosen two such areas as our examples: the island of Vilsandi, with the Vaika bird islets in its immediate vicinity, is the oldest bird protection area in the Baltic states and has been written about by authors such as Alma Toom, Franz Xaver Graf Zedtwitz, Fred Jüssi, and Tõnu Õnnepalu; Muraka Bog in the Alutaguse region, a remote piece of wilderness, has attracted hikers, writers and photographers for almost a century (key authors including Juhan Lepasaar, Edgar Kask, Fred Jüssi and Tiit Leito). These two case studies represent the natural diversity of Estonia and the texts, correspondingly, are diverse and bear the marks of the textual strategies and conventions of their times of creation. It is interesting to observe how different authors have been following one another's footsteps – either in landscape or in textual practice. Such similarities and differences between the texts are caused by natural conditions as well as by cultural conventions. In the broad sense they also correspond to the historical distinction between coastal and inland rural cultures in Estonia. Both areas feature natural environments untouched by human agricultural activity, the closest to what we could call *wilderness* or *pristine* nature in Estonia.

Ecosemiotic Framework

Our theoretical and methodological standpoint in the present discussion is the semiotics of the environment, or ecosemiotics. Semiotic research focuses on the mechanisms of meaning making, as it happens in communication and interpretation. Classic semiotic analysis concerns human

cultural activities and artefacts, such as literature, film, art, advertising, etc. Ecosemiotics, however, focuses on sign relations or semiosis between cultural phenomena and the environment and analyses their types, hierarchy, outcomes and dynamics. This understanding implies that human semiotic activities should be considered as taking place among a multitude of sign processes and semiotic systems of other species, some partly accessible to us, some rather different from ours. Ecosemiotics as a research paradigm emerged in the early 1990s.[2] Depending on the context and the research object, ecosemiotics makes use of the concepts of zoosemiotics and of biosemiotic criticism.[3] The ecosemiotic approach is locally rooted, as it derives from the biosemiotics of Jakob von Uexküll and the cultural semiotics of Yuri Lotman – authors who both lived and worked in Estonia. Semiotics provides suitable tools for analysing cultural and natural diversity and the great number of border zones and boundaries that come together in the Estonian environment. In the following, we discuss central theoretical concepts which are subsequently applied to a semiotic study of examples of Estonian nature writing.

Texts and Culture are Locally Situated

For an ecosemiotic approach the relationship between a text of nature writing and its object(s) of representation is never absolute or fixed, but depends on the knowledge of the reader and on the seasonal and temporal changes that occur in the environment and in animal behaviour. Cultural texts and artefacts attach themselves to various semiotic anchoring points in the local environment which have semiotic character and potential.[4] In this respect, culture–nature relations always have a history and are locally contextualised. The locality of a text can lie in its references to specific climatic-, vegetation- or fauna-related features, but also in more subtle details, such as references to folklore, vernacular names of species and places, local inhabitants and their practices, that can often even be micro-regional.

From the semiotic perspective, a written text and the environment are tied together in multiple ways: by *representative*, *mimetic*, *motivational* and *complementary* relations. Different types of meaning relations can be active at the same time, they can combine in complex ways and interact with one another. On the most basic level, the nature essay *represents* the environment in a certain culturally specific way and via the interpretation of a particular author. Nature writing can also be *mimetic* in the sense that the structure or the narrative of the text can repeat certain environmental

or physical sequences. For instance, in an animal story the sequence of events can be determined by the biological life cycle or daily activities of the animal.

At the same time the text and the environment can be in a *complementary* relationship so that the reader's experience of the text and environment become actualised simultaneously in the reading process, supporting each other. In such a case, not all the meaning relations potentially present in the environment need to be represented in the text. The author will be able to presume that his/her readers are familiar with that environment's common characteristics and properties. In the case of a complementary relation, interpretative loops emerge between the text and the environment; the text interpreted with reference to the environmental experience, the environment, in turn, interpreted on the basis of textual knowledge. The environment with its characteristics and potentials may even *motivate* the author – and the readers – to choose a specific type of textual representation.

To explicate and explain these interconnections between nature writing and the environment, the model of *nature-text* has been proposed. In this model, ecosemiotic research is considered to have at least a double object: "in addition to the written text that speaks about nature and points to nature, it should also include the depicted part of the natural environment itself, which must be, for the relation to be functional, to at least some extent textual or at least textualizable."[5] In order to incorporate the environment into ecosemiotic analysis of literature, an elaborate model of the relations between the text and the environment is needed as a tool for analysis. The complexity of a literary work must also be taken into account: it is multi-layered, modelling the environmental relations of the particular author, in the contextual conditions of the particular culture and era, as well as particular literary conventions. The formal characteristics of nature writing – the literary and narrative strategies employed in the text – are often organised and shaped according to the particular environmental relationship it represents. Thus, the nature-text model asks, what kind of literary devices are there to convey what kind of human–environment relation (message) in the context of what kind of environment?

The Umwelt Perspective Taken into Account

The ecosemiotic approach is deeply indebted to Umwelt theory, proposed in 1909 by Jakob von Uexküll, a Baltic-German biologist.[6] Umwelt refers to the complex life-world consisting of an animal and the part of the

environment it lives in as a mutually bound entity. Uexküll argues that those and only those parts of the environment to which an animal is meaningfully linked are present for it and are contained in its subjective universe or Umwelt.

In regard to human cultural activities and artefacts, Hungarian-American semiotician Thomas A. Sebeok has distinguished between zoosemiotic modelling and linguistic or verbal modelling.[7] The background for his ideas about the notion of modelling can be found in the Tartu–Moscow School of Semiotics that offered a theory of modelling systems in the framework of cultural semiotics, with a distinction made between primary, language-based, and secondary, artistic, modelling.[8] On the most general level, modelling can be described as a process of making sense of some processes or phenomena with the help of (internal or external) representations that are at least partly based on analogies.[9] According to Sebeok, we possess two mutually sustaining modelling systems: the anthroposemiotic verbal one, which is unique to the human species, and the zoosemiotic nonverbal one, which is Umwelt-based and unites us with the world of other animals.[10] Direct and spatial perceptions, tactile and olfactory sensations, as well as many occurrences of nonverbal communication belong to the sphere of nonverbal modelling.

We propose that works of nature writing be considered as models of human–environment relationships. Combining Sebeok and Lotman's ideas, three different layers of modelling can be suggested to appear in a work of nature writing: zoosemiotic modelling, linguistic modelling, and artistic modelling.[11] In case of a literary work, the level of artistic modelling is of primary importance; however, as a rule elements of zoosemiotic and linguistic modelling are also present in literary works of nature writing, especially as its primary objects of representation are the mutual relations of humans with the environment and other species.

Texts and Their Reception Form an Intertextual Ecosystem

An ecosemiotic understanding of the hierarchical diversity of sign processes as well as different types of modelling relations between an organism (including a human one) and the environment also encompasses human intellectual activities. A text of nature writing is a representational model of the meaning relations that a writer has perceived in the environment under specific conditions, determined by the time, location, and the biological and cultural abilities of the perceiver. Nature writing renders these perceptions using written verbal language, an exclusively human

means of communication. Moreover, a literary text makes use of different poetic and rhetorical devices, such as metaphors and twists in the plot. Literary criticism itself can be regarded as one among many modelling practices by which humans make sense of their surroundings.

Texts are bound together by means of intertextuality. Intertextuality can directly manifest itself in a set of texts sharing certain genre conventions – in the case of nature writing, these are often the requirements of non-fiction, such as being informed of natural history, stating the author's ethical standpoint, or making references to literary forms such as pastoral or the jeremiad.[12] Intertextuality on the level of verbal modelling includes quotations, references to the titles by other authors, and mentioning of their names in subsequent nature writing. Texts of nature writing can also be linked indirectly through references to the same locations, itineraries, seasons, species or particular natural phenomena. Intertextual references are not limited to written texts, but may embrace representations of nature that are based on visual, auditory or other sensory experiences.

Case Study: In the Western Estonian Archipelago

Our first study area, Vilsandi, is Estonia's westernmost inhabited island in the Baltic Sea, with a surface of about nine square kilometres. At the beginning of the twentieth century the island had approximately two hundred permanent inhabitants: there were thirty-two farmsteads, a small military unit and a lighthouse with its crew. At present, Vilsandi's population consists of sixteen people. Bird protection has been practised there since 1906: the Vaika bird sanctuary was the first official nature protection site in the whole of czarist Russia. The first local enthusiast to protect the breeding islets of the waterfowl was Artur Toom, the then lighthouse keeper who later developed nature tourism on Vilsandi and the surrounding islets. Nature writing about Vilsandi emerged and reached its heyday during that period.

World War II had disastrous results in Vilsandi: during the war, bird islets were vandalised and nests destroyed, Toom was deported to Siberia, and the islands declared a closed military zone. Nature protection was re-implemented in 1957, but at the time visiting Vilsandi was allowed for scientific purposes only. Ordinary people could 'peek' into the nature reserve only via nature writing. Currently, Vilsandi National Park embraces approximately 160 islets and rocky elevations in the coastal sea around Vilsandi where waterfowl and seals are breeding, and it has regained its reputation as a valued nature tourism destination, thus

resulting in new nature writing. This relatively small and remote area is 'covered' with a remarkably dense layer of literary representations.

Artur Toom, the initiator of bird protection in Vilsandi, was a great storyteller, relating to his visitors strongly anthropomorphic stories about the birds' 'family life,' their faithlessness, and male seabirds' general lack of fatherly instincts. He hardly wrote anything himself, but the book *Vilsandi Linnuriik* [Vilsandi Bird Kingdom] by his wife Alma Toom, published in Tartu in 1932, relies mostly on his stories, and promotes his position as "the Bird King."[13] In addition to rendering her husband's stories, Alma Toom describes the looks and habits of the waterfowl nesting on Vaika islets through both an artistic lens and the eye of a naturalist. High-quality nature photographs by two German photographers, Ecke and Brandt, also contribute to the good overall impression. Toom's book describes the birds, following the order of their arrival in spring: seagulls, sterns, mergansers, shelducks, oystercatchers (*Haematopus ostralegus*). Waterfowl belonging to the *Anatidae* family are introduced: eiders, tufted duck (*Aythya fuligula*), goosanders and mergansers. Coastal people's vernacular beliefs and practices associated with waterfowl are likewise present in Toom's accounts; for example, she mentions that the chicks of merganser and shelduck are able to form emotional bonds with humans, a claim further elaborated in August Mälk's bird stories. She also mentions the widely known popular practice of collecting the eggs of waterfowl in springtime. The eggs of common eider (*Somateria mollissima*), goosander (*Mergus merganser*), red-breasted merganser (*Mergus serrator*) and common shelduck (*Tadorna tadorna*) have traditionally served as an addition to the diet of both the coastal people and their domestic animals. Toom's approach is exemplary in its qualities of locality, situatedness and mimetic relations. Her book is narrated from a point of view that is markedly local, its spatial scope limited to the islets of the bird sanctuary. Structured by bird phenology, the book mimetically follows the migration and life cycles of the birds.

An interesting counterpart to it, representing an outsider's take on Vilsandi, is *Vogelkinder der Waikariffe* [Birdlings of Vaikas] by Franz Xaver Graf Zedtwitz, German photographer and nature writer, published in Berlin in 1933.[14] Both authors pay attention to the same species, places and stories, and interpret these, drawing on the knowledge of one another's work, observations and itineraries. An author of a piece of nature writing is at the same time a reader and commentator on his or her colleagues. The books by Toom and Zedtwitz are part, that is, of the same intertextual ecosystem.

August Mälk and Johannes Piiper also contributed to this intertextually united group of writers with their pieces from the 1930s. Mälk, a writer native to the island of Saaremaa, published a book *Lugusid lindudest* [Bird Stories] in 1934.[15] His waterfowl-breeding stories are based on actual observation in Vilsandi. Although he anthropomorphises his bird characters rather markedly, he nevertheless takes the peculiarities of the bird Umwelt into account even more than the previously discussed authors. For example, one of his stories is about an eider who dies in a fishing net while diving. A net would generally have no active meaning in an eider's Umwelt; neither are underwater nets made for catching birds. An accidental encounter proves to have a fatal meaning, as the diving bird cannot find a way back out of the funnel-shaped net. Whereas Toom and Zedtwitz observe birds from a naturalist's point of view, Mälk's more empathetic approach enables him to better incorporate the perspective of bird Umwelten into his writing.

Two further naturalists are Johannes Piiper, the grand old man of Estonian nature writing, with his collection *Pilte ja hääli kodumaa loodusest* [Pictures and Sounds from the Nature of Homeland] (1935),[16] and Fred Jüssi, whose *Kajakad kutsuvad* [The Call of the Gulls] (1966) describes the main species of breeding birds in Vilsandi (gulls, merganser, oystercatcher, eider, songbirds).[17] Jüssi discusses the actual work of nature protection, but also the possibilities of a commercial use of eiderdown, echoing thus the ideology of the Soviet state that nature must be of practical use to people. In Piiper's case, motivationality is manifested by his pieces always bearing precise dates, time of day, and information about the route taken. The number of species mentioned in his texts is remarkably greater than in the case of other authors. In the manner of a thorough naturalist, he takes a small portion of the landscape and provides a micro-description: the plant species he notices growing, their colour and stage of vegetation; the insects and invertebrates that are visible and active; the birds heard and what their songs are like. As a rule, no ugly or shocking things, such as decaying bodies or spoiled landscapes, are mentioned, although he frequently points out that birds seem to feel disturbed by approaching humans, and that some chicks are trampled by the visitors because of the chicks' immaculate disguise.

Contextual information plays an important role in the most recent book in the long row of Vilsandi representations, *Lõpetuse ingel* [Angel of Conclusion] (2015) by Tõnu Õnnepalu.[18] In many ways, this work is a counter-balance to the previous tradition of Vilsandi nature writing. The time frame is set around the autumn migration of birds, instead of

the spring migration or the breeding season featured by earlier authors. This choice has its impact on the level of artistic modelling – the autumn migration suggests an ending, departure, decay, instead of the hopes and expectations of a breeding season, contributing to the author's overall sentiment of concluding a certain time period in his life. It also facilitates linguistic modelling in rendering the bird sounds.[19]

In the North-East Estonian Woodlands

The second case study of this chapter focuses on representations of the nature of north-east Estonia. Alutaguse, the region between the eastern end of the Gulf of Finland in the Baltic Sea and the northern part of Lake Peipsi, is mostly covered by bogs and forests and is home to many large mammals such as wolves, bears and elks. Probably the area of Estonia least affected by humans, Alutaguse gives refuge to several endangered species, for example the flying squirrel (*Pteromys volans*) and the peregrine falcon (*Falco peregrinus*). Until recently, there has been relatively little industrial agriculture and forestry in the Alutaguse region because of its inaccessible landscape of bogs and forests. At the same time, the geographical conditions have supported small farms, local communities and traditional activities such as hunting, bee-keeping, collecting cranberries and cloudberries. The history of remote single farms in the Alutaguse woods may be traced back several centuries.

The present case study focuses on books by two authors who have written extensively about the Alutaguse region: Juhan Lepasaar and Edgar Kask.[20] Both authors are self-educated writers: Juhan Lepasaar (b. 1921) was recruited into the German Army during World War II and lived in the forests as an illegal guerrilla fighter after the war. Due to this, his career choices were limited during the Soviet era and he worked as a truck driver for most of his life. Edgar Kask (b. 1930) worked in land improvement and environmental management until he became a freelance writer and photographer in the 1970s. For these men as well as for many other Estonian nature essayists, thinking and writing about forests was an intellectual escape route from the oppressiveness of the surrounding Soviet reality.

The books of both authors have recognisably similar structures: they are extremely heterogeneous collections that include reflections about the Alutaguse landscapes, the various components, species, and places of these; stories of local people, their opinions and folklore; chapters dedicated to different wild animals and encounters with them; observations on phenological data and environmental change; recollections of personal

experiences, poems and autobiographical information. Different storylines involving people, culture and nature run parallel in these books, the texts as a whole creating a meshwork out of the individual storylines.[21] As such, the structure of the books represents an artistic modelling and marks a sensitive relation to local conditions. The authorial position manifested in such structures is characterised by the lack of binary oppositions in positioning humans and animals, nature and culture, the past and the future. For instance, both Lepasaar's and Kask's attitudes to signs of modernisation in Alutaguse are quite neutral: mostly they just describe building railroads, advancing the electricity grid, and land improvement as part of a social and cultural process.[22]

The perception is that the authors as well as their books are associated by intertextual ties to become part of a common 'ecosystem.' Kask and Lepasaar became connected by walking the same forest trails and being in the same environment. They know each other personally and their books include common motifs, for instance stories about the foresters' family of Meurasaare. They even mention each other in their texts, Lepasaar describing, for example, his meeting with Kask: "We are sitting with Edgar on thick wooden stumps in front of his cabin on the edge of Muraka Bog. The sun is pleasantly hot on our backs ... We exchange only rare sentences. The unexpected heat makes us languid, thoughts are wandering on their own."[23] Both men become characters in each other's writings, as the texts become meta-reflective, including references to the activities of nature photography and nature writing.

References to tracks or traces are present in the titles of four of the books referred to above: *On the Marsh Tracks*, *On the Forest Paths*, *The Road to Silence* and *A Journey to the Sun*. The motif of a road is used in many chapter titles too and, indeed, is of central importance for the environmental experience in Alutaguse: "According to the popular jokes, even the dead could not be brought out of a faraway forest village where there were no roads in the summer; they were put on the poles laid across the beams in the threshing room to dry in the smoke and were brought to the parish cemetery to be buried there only with the winter roads."[24] The notion of the road suits the style of writing as well as the ideological undercurrents of the books. Roads and paths are related to the local tradition and memory – roads connect people; if roads are not used, the forest will claim them again. The books repeatedly mention the secret tracks in the bogs that local people have used as shortcuts and hideouts. A meeting point between a traveller and the environment, the road also brings about new experiences. For instance, the human track can cross the tracks of wolves, who have

their own Umwelt, their ways of living and chasing prey, but who have also learned to use irrigation ditches for easier movement in the forests.[25]

One specific topic that is present in the books of both authors is the discussion of experiences related to getting lost in the forest. It is easy to get lost in vast forest areas, while there is little possibility of getting lost on the islets that constitute our other case study. In the experience of getting lost, a shift occurs in the relations between the human and the environment: the human loses his/her control over the environment and the forest gains the agency in directing his/her movement. Conscious, language-based modelling of the environment gives ground to more primordial, pre-linguistic and zoosemiotic modelling. Lepasaar has written about his experience of losing his way in the forest:

> Go to the great woods of Alutaguse and look up as you walk, towards the tops of the trees branching out, leave the ground unnoticed, never pay attention to it. Minutes go by, the weather is windless and cloudy, the winter has shaped the trees uniform, so similar to one another, so alike in appearance. And henceforth, without you noticing, Alutaguse has caught you in its web.

He continues:

> Even some fear creeps into the chest as images of a vague danger are becoming stronger and the reality is receding. We wade through the snow for yet another kilometre or so, then I start feeling a cramp in my left leg from overexertion. I am stumbling along with difficulty now. No, I cannot remain in the forest, I have to go on. My hat and my fur coat are stiff from the cold and covered with frost like the trees of the forest, the only difference seems to be that the forest is standing still, while I, in my coat and hat, am trying to move on at all cost.[26]

Kask describes a similar situation when he suggests that a group of friends should take a shortcut in Muraka Bog. His instructions were not sufficiently accurate and the people ended up in danger of getting lost.[27] Such stories foreground a deep connection between the people and the environment that can emerge only from a real and two-sided encounter with nature. The author is willing to denounce his position as a specialist with good knowledge of nature, he acknowledges his limitations and admits the possibility of making mistakes. Edgar Kask has given his essay about being lost the title *Lolluse mõõdupuu* [The Measure of Stupidity], indicating that human ignorance or recklessness is the main reason behind such experiences. The possibility of getting lost underlines the necessity of learning the signs of the environment and showing due respect to nature.

Discussion and Conclusions

Our theoretical standpoint in this paper is that nature writing works as a model of the specific environmental relationships of the particular culture and era. When analysing individual texts we can ask what kind of literary means are present to convey what kind of environmental experience in relation to what kind of environment. Both coastal and forest-bound local traditions of nature writing are connected by general common features, from cross-referring between different authors to the complex interplay between local environmental conditions, cultural history, and the characteristic features of nature writing as a modelling system.

In the case of nature writing about Vilsandi, the generally common features are the structure and the time frame. The individual essays are each dedicated to one species, its habits and breeding success. The time frame is set around spring and summer, the breeding season of the migratory waterfowl, the only exception being Õnnepalu's work where the author's presence on the islet coincides with the autumn migration of birds. In the case of nature writing about the Alutaguse region by Kask and Lepasaar, the dominant feature appears to be the local diversity of the environmental experience and the meshworked connections between the Alutaguse wilderness and the people living there. By having an intense local experience, the author, his life, recollections and style of expression are turned into a medium and a bridge between the reader and the environment, understood as a meshwork of culture and diverse nature, memories of the past and potentials of the present. The authors' personae are manifested in different stories, experiences and localities to the degree that the distinction between author, text and referent (i.e. the natural environment) appears to dissolve.

In both cases, we can see that the texts are strongly bound to locality, local knowledge and popular practices. The relations between texts and environment are often motivational or complementary – aspects that require an additional effort from the reader who has to have some previous knowledge of the environment and its features (such as sounds), in order to fully understand the written text. We also detected instances of zoosemiotic modelling, as well as the general awareness of the writers that all species – humans included – have their own peculiar ways of perceiving and relating to their surroundings. In this way, pieces of nature writing become nature-texts, entities whose textual and natural components are virtually inseparable and mutually linked, like elements of an ecosystem.

Notes

1 Johannes Piiper, *Pilte ja hääli kodumaa loodusest: loodusesõbra muljeid maalt ja merelt* [Pictures and Sounds from the Nature of Homeland] (Tartu: Noor-Eesti, 1935).

2 For a historical overview, key principles and applications of ecosemiotics, see Timo Maran and Kalevi Kull, "Ecosemiotics: Main Principles and Current Developments," *Geografiska Annaler: Series B, Human Geography* 96, 1 (2014), pp. 41–50.

3 On zoosemiotics, see Timo Maran, "Dimensions of Zoosemiotics: Introduction," *Semiotica* [Double Special Issue: "Dimensions of Zoosemiotics"] 198 (2014), pp. 1–10; Dario Martinelli, *A Critical Companion to Zoosemiotics: People, Paths, Ideas* [Biosemiotics 5] (Berlin: Springer, 2010); on biosemiotics criticism, see Timo Maran, "Biosemiotic Criticism: Modelling the Environment in Literature," *Green Letters: Studies in Ecocriticism* 18, 3 (2014), pp. 297–311.

4 Timo Maran, "Semiotization of Matter. A Hybrid Zone between Biosemiotics and Material Ecocriticism," in Serenella Iovino and Serpil Oppermann (eds.), *Material Ecocriticism* (Bloomington: Indiana University Press, 2014), pp. 141–54.

5 Timo Maran, "Towards an Integrated Methodology of Ecosemiotics: The Concept of Nature-Text," *Sign Systems Studies* 35, 1/2 (2007), pp. 269–94, 280.

6 For English translations of Uexküll's major works, see Jakob von Uexküll, "The Theory of Meaning," *Semiotica* 42, 1 (1982), pp. 25–82; Jakob von Uexküll, "A Stroll through the Worlds of Animals and Men: A Picture Book of Invisible Worlds," *Semiotica* 89, 4 (1992), pp. 319–91.

7 See Thomas A. Sebeok, *A Sign Is Just A Sign* (Bloomington: Indiana University Press, 1991); Thomas A. Sebeok, "'Tell me, where is fancy bred?' The Biosemiotic Self," in Thomas A. Sebeok, *Global Semiotics* (Bloomington: Indiana University Press, 2001), pp. 120–27.

8 See Juri M. Lotman, "Primary and Secondary Communication-Modeling Systems," in D.P. Lucid (ed.), *Soviet Semiotics: An Anthology* (Baltimore: Johns Hopkins University Press, 1977), pp. 95–98.

9 Yuri Mikailovich Lotman, "Тезисы к проблеме "Искусство в ряду моделирующих систем" [The Place of Art among other Modelling Systems]," *Труды по знаковым системам* [*Sign Systems Studies*] 3 (1967), pp. 130–45, 130.

10 For an analysis of human–dog interaction see, for example, Louise Westling, "The Zoosemiotics of Sheep Herding with Dogs," in Kadri Tüür and Morten Tønnessen (eds.), *The Semiotics of Animal Representations* (Amsterdam: Rodopi, 2014), pp. 33–52.

11 For application of these categories in analysis, see Maran, "Biosemiotic Criticism."

12 See Lawrence Buell, *The Environmental Imagination. Thoreau, Nature Writing, and the Formation of American Culture* (Cambridge and London: The Belknap Press, 1995).

13 Alma Toom, *Vilsandi linnuriik* [Vilsandi Bird Kingdom] (Tartu: Loodus, 1932).
14 Franz Xaver Graf Zedtwitz, *Vogelkinder der Waikariffe* [Birdlings of Vaikas] (Berlin: Verlag Scherl, 1933).
15 August Mälk, *Jutte lindudest* [Bird Stories] (Tallinn: Eesti Õpetajate Liit, 1934).
16 Piiper, *Pilte ja hääli kodumaa loodusest*.
17 Fred Jüssi, *Kajakad kutsuvad* [The Call of the Gulls] (Tallinn: Eesti Raamat, 1966).
18 Tõnu Õnnepalu, *Lõpetuse ingel. Märkmeid sügissaarelt* [Angel of Conclusion. Notes from an Autumn Island] (Tallinn: Kultuurileht, 2015).
19 On the zoosemiotics of verbal modelling of bird sounds, see Kadri Tüür, "Bird Sounds in Nature Writing: Human Perspective on Animal Communication," *Sign Systems Studies* 37, 3/4 (2009), pp. 226–55.
20 Juhan Lepasaar, *Laaneteedel* [On the Forest Roads] (Tallinn: Valgus, 1989); Juhan Lepasaar, *Metsakandle keeltehelin* [Sounds of Forest Zither] (Oonurme: J. Lepasaar, 2011); Juhan Lepasaar. *Sooradadel* [On the Marsh Tracks] (Tartu: Pärandkoosluste Kaitse Ühing, 2011); Edgar Kask, *Tee Vaikusesse* [Road to Silence] (Tallinn: Eesti Raamat, 1977); Edgar Kask, *Teekond päikeseni* [Journey to the Sun] (Tallinn: E. Kask, 2006).
21 Meshwork in Tim Ingold's sense refers to multiple and interlaced patterns of movement and growth; see Tim Ingold, *Lines: A Brief History* (London: Routledge, 2007), p. 75.
22 Kask, *Teekond päikeseni*, p. 117; Lepasaar, *Laaneteedel*, p. 22.
23 Lepasaar, *Sooradadel*, p. 66.
24 Lepasaar, *Laaneteedel*, p. 9.
25 Ibid., p. 78.
26 Ibid., p. 119.
27 Kask, *Teekond päikeseni*, p. 127.

III

Tüür, Kadri 2009. Bird sounds in nature writing: human perspective on animal communication.
Sign Systems Studies 37(3/4), 226–255.
DOI: http://dx.doi.org/10.12697/SSS.2009.37.3–4.11

Sign Systems Studies 37(3/4), 2009

Bird sounds in nature writing: human perspective on animal communication

Kadri Tüür

Department of Semiotics, Institute of Philosophy and Semiotics, University of Tartu
Tiigi 78, Tartu 50410, Estonia
e-mail: tyyr@ut.ee

Abstract. The object of study in the present article is birds, more precisely the sounds of birds as they are represented in Estonian nature writing. The evolutionary and structural parallels of bird song with human language are discussed. Human interpretation of bird sounds raises the question, whether it is possible to transmit or "translate" signals between the Umwelts of different species. The intentions of the sender of the signal may remain unknown, but the signification process within human Umwelt can still be traced and analysed. By approaching the excerpts of nature writing using semiotic methodology, I attempt to demonstrate how bird sounds can function as different types of signs, as outlined by Thomas A. Sebeok. It is argued that the zoosemiotic treatment of nature writing opens up a number of interesting perspectives that would otherwise remain beyond the scope of traditional literary analysis.

1. Introduction

Birds have fascinated humans probably throughout the history of our species. A recurrent motif in fairy-tales is that a man who is able to understand the language of birds will gain wealth, fame, and earn a good life. The urge to extract useful information from the bird songs has been inspired not only by the above-mentioned pragmatic interests, but also by aesthetic or intellectual reasons. Birds are probably the most popular

class of animals that enjoys human aesthetic appreciation. The reasons may be many: birds inhabit practically all corners of Earth; their sighting does not require much resource or specific knowledge, and it can be done parallel to other human activities (such as ploughing or taking lunch, for example). Unlike many other animals, birds are generally not perceived as a source of threat or harm for humans. Maybe most importantly, birds stand out from other aesthetically appealing animals, such as tropical fish or butterflies, for the fact that they appeal to several senses, not only to sight. Hearing and listening to bird sounds has historically been evidently even more widespread than visual observation, as the former can easily be performed without any special equipment. A number of birds are able to produce sounds audible at distances of several kilometres. Low-frequency calls, such as produced by cassowary or bittern, for example, are especially suitable for communicating over long distances, and are very impressive to human ears. Also, the tactile aspect of bird aesthetics should be mentioned here: it is most probably more pleasant feeling for a human being to pet a bird than a fish or a butterfly.

Bird sounds have predominantly been studied in the framework of biology (see Gill 2007), more precisely of biocommunication, a branch of ethology (most notably the popular works of Lorenz, Tinbergen, Marler, etc.). During the 20th century, study fields such as bioacoustics, zoosemiotics, and zoomusicology (see, for example, Kroodsma, Miller 1982; Sebeok 1990; Martinelli 2002), have taken an interest in analysing bird sounds. Martinelli (2005: 136) has proposed a more detailed division of zoosemiotics, discriminating between ethological and anthropological branches, whereas the former is closely related with life sciences and the latter with social sciences.

In the framework of humanistic disciplines, Gaston Bachelard's philosophical treatment of nest (Bachelard 1969) can be mentioned. Several folkloristic (Ingersoll 1923; Hiiemäe 1996–1997), and literary studies (Lutwack 1994; Rowlett 1999) on birds and bird sounds have been published. Let us also recall here that the title of Rachel Carson's ground breaking book *Silent Spring* is related to bird song. Analyses of bird songs in literary texts have, however, been regrettably sporadic so far. This is still an important area of research, because, borrowing a thought from Leonard Lutwack, the author of *Birds in Literature*,

literature has made and must continue to make the reading public sensitive to nature, and literary birds may prove to be our best link to it.

2. Sounds of birds

John Deely, one of the most influential contemporary semioticians, remarks in his *Basics of Semiotics* that no matter from which field the object of study, if it is considered in a semiotic framework, an exclusive treatment of constructed signs only is not a good standpoint, if our goal is to understand the processes that link human semiosis up with the rest of the life (Deely 2005: 150). In *Signs: An introduction to semiotics*, the ground-layer of zoosemiotics, Thomas A. Sebeok writes, "[…] it is essential to adopt a research strategy that compares human and animal communication systems in order to get a meaningful glimpse into the nature and ubiquity of semiosis" (Sebeok 1994: 41). Already in 1961, an early zoosemiotician Peter Marler has claimed that in the study of communication, all signs, not necessarily the verbal ones alone, are of special importance that may cast light to understanding several evolutionary mechanisms (Marler 1961: 295–296). The importance of the study of bird song as an evolutionary parallel to human language has recently been stressed by scientists in behavioural studies (Salwiczek, Wickler 2004). The authors argue that from the evolutionary view point, human language, analogously to bird song, is a predominantly social phenomenon. Salwiczek and Wickler list several functional parallels between bird song and human language: they both are a part of an individual's adaptive profile; they are subject to traditive selection that may also have an impact on genetic selection; a close connection between vocal utterances with gestures and body language is characteristic to both human language and bird song. On a more detailed level, they have lexical elements and they follow certain syntactic principles and temporal organisation; they generally have semantic content; both can be used in dialogic interaction and have vocative elements (Salwiczek, Wickler 2004).

In contemporary ornithological handbooks, a traditional differentiation exists between bird songs and calls (Gill 2007: 217). In addition to these two types of bird sounds, third one is important in the context

of the present article, namely the sounds that birds make while moving, for example, with their wings or tails during flying.

The term "song" mainly refers to birds' territorial calls that are often aesthetically pleasing to human ear for their specific, repeated patterns (Gill 2007: 217). Martinelli points out the extensive use of musicological terms in ethology. In regard of the term "song", he states that in this framework it is generally used to denote functional aspects of animal behaviour, rather than to refer to aesthetic activities or qualities (Martinelli 2007: 122). Whether and to which degree acoustic behaviour is considered song, or music generally, depends most probably not only on the Umwelts of different species, but also on the affiliation in different (ethnic, age, etc.) groups of human species.

An interesting example of the contested usage of "bird music" is a book that uses the phrase as its title, and that combines the traits of an ornithological handbook and sentimental nature writing (Turnbull 1946). In the present article, the question of "music" is left out, and only the potential significance of some exemplary sounds produced by birds is studied. The complexity of the bird songs' classification and analysis is also increased by the fact that thanks to the specific anatomy of the birds' vocal system, it is possible for some of them to sing in "two voices" at the same time, using different frequencies and different phrase structures simultaneously (Gill 2007: 226).

In most species, songs are performed by male birds whereas calls are uttered by both sexes. Thanks to outstanding neural song control system, both sexes of certain bird species are capable of reproducing a wide variety of sounds, which enables them to engage in complex behaviour of dialogical nature (Salwiczek, Wickler 2004: 171). Bird calls can be divided into warning, flock, flight, feeding, nest and distress calls (Gill 2007: 217). Two types of bird songs can be distinguished, namely those relating to an outside event, and others that manifest a particular behavioural stance of the signal sender (Salwizcek, Wickler 2004: 173).

On the basis of the prospective addressee, signal exchange between animals may be divided into proprioceptive (such as echolocation), intraspecific (such as mating calls) and interspecific (such as prey–predator) communication (Martinelli 2007: 36). The sounds which are meant for other birds to help in locating the sender, are made up of short notes with broad frequency ranges; the sounds that are meant to report

of danger and simultaneously conceal the exact location of the sender, are faint, high-pitched, and with narrow frequency range (Marler 1957; Marler 1961: 302). The alarm calls are often very similar in sympatric birds, enabling inter-specific communication regarding the literally vital information about the threat, its location and other important characteristics (Marler 1957: 21–22). In contrast, the songs related to reproduction are strongly selected for specific distinctiveness, although colonial species' vocabulary tends to have less variation than that of territorial birds, as Marler (1957: 18) remarks. Sebeok points out that territoriality is a phenomenon that assumes recognition of other individuals, including the ability to discriminate between their individual acoustic calls (Sebeok 1990: 82–83).

In his brief analysis of the acoustic channel in comparison with other sensory modes used to transmit signals in animal communication, Martinelli writes that one of its central traits is the rapid fading of the signal, that is both an advantage, enabling immediate feedback, and disadvantage, as the signal lasts for a limited period only (Martinelli 2007: 43). The repeating or reproduction of an acoustic signal is energy-consuming. The reproduction of bird sounds is a problem in human communication as well. In folklore, many bird songs have been imitated by means of onomatopoetic formulas; the selection has generally favoured species that have pragmatic or symbolic importance in a particular culture. For centuries, naturalists have had trouble finding scientifically apt ways of transliterating birds' sounds either by means of alphabetical writing or music notation, but the attempts have not yielded a successful, generally accepted result so far. The compilers of the *Collins Bird Guide* (Collins 1999), one of the most widely acknowledged European handbooks for birding, take a whole paragraph in the introduction to explain their choices of transcript of the bird sounds. The authors state,

> Although rendering bird voices in writing inevitably is inexact and personal, a serious effort has been made to convey what is typical for each call by trying to select the letters and style of writing which are most apt. […] We do not share the opinion that written voice transcriptions are so subjective that they have little value at all (Collins 1999: 9),

thus indicating that the question of converting bird sound into alphabetical system is a problem far from being solved and agreed upon yet. Nowadays, tape-recording, digital analysis and oscillographic depiction of bird sounds are some means of evading the Procrustean bed of human language in reproducing the bird sounds. These means, however, are also too costly to use in many cases.

The parallels between bird songs and human language are not only evolutionary, but also structural. Similar sounds, tones and tempos enable humans to describe bird songs in terms such as syllables and phrases, governed by clear syntactic principles (Salwiczek, Wickler 2004: 166). The same authors state that not only pair mates, but also rivals, for example, benefit from co-ordinated vocalisation in the forms of duets and turn-taking in singing that are analogous to the system of turn-taking in human talk (Salwiczek, Wickler 2004: 168).

Such complex social behaviour requires outstanding memorising capacities. Proof of the existence of such abilities in birds is given for example by the performance of rapid and complex motor activities necessary for producing bird songs. These are rather similar to the ones that guide human language utterances or dexterity, like violin playing (Gill 2007: 219). It has been found that the brain areas that deal with complex cognitive abilities are also responsible for language-like acoustic communication (Salwiczek, Wickler 2004: 178). Depending on the species, a bird can use more than 100 different songs (or varieties of songs). Also, it depends on the species of the bird, whether its vocalisation abilities are inherited or may be improved during the individual's lifetime by learning (Gill 2007: 229). The songs learnt by imitating several dominating males' songs lead to local dialects and the temporal persistence of certain "traditions" of singing that can well be compared with human cultural evolution. Local dialects developed in birds are able to limit the gene flow, as communication, and consequently, mating, between birds using songs deviating from which they have heard during their own upbringing period, are less likely (Salwiczek, Wickler 2004: 169).

Peter Marler discriminates between five types of information that an individual bird's song may convey: information about the belonging to a certain species, and to either sex; individual, motivational, and environmental information (Marler 1961: 302). Whereas species-

specific information is relatively easy to detect on the basis of some ornithological knowledge, as well as the belonging to either sex, especially in sexually dimorphic species, then detection of information related to one particular individual is not an easy task, at least not for an average human listener of bird songs. The information about the motivation of a bird and the information the song or call conveys about the environment, are most difficult ones to define, Marler writes (1961: 304), but still they may have the greatest implications for the understanding of the evolution of animal communication systems. The basic capacity of conveying information about the environment by means of signals is common to human language and bird song. Marler represents the view that communication, be it in humans or in other animals, has predominantly social rather than informational function. He proposes that the crucial difference lies in the temporal element of the communication, namely in *delay*, "In animals the delay between perception of an object in the environment and the emission of a signal conveying information about that object is usually a short one. In man the delay may be extended almost infinitely," Marler writes (1961: 308). That very delay is one of the reasons why people are able to compose and enjoy nature writing. It is possible that the same delay in signalling enables humans to construct a special type of sign, namely symbol that adds an extra layer to the interpretation of environmental stimuli.

Before proceeding to a more detailed analysis of the different sign aspects of bird sounds, a short introduction to nature writing and its possible relevance to semiotic studies is provided.

3. Nature writing

In the *Basics of Semiotics*, the main concern of Deely is to explain how semiosis works. The central and unifying object of semiotics as the doctrine of signs, according to Deely, is "the action of signs explicitly recognized as an activity or process constructive not only of human experience but of all organismic experience and, we shall argue, of the physical environment itself" (Deely 2005: 99). In human semiosis, physical environment is converted into a relational one. The experienced signs, the usage of which is common for humans with the rest of

the life-world, are reconstituted as stipulatable. In human semiosis, awareness of the signifying activity is present, whereas other animals use signs without knowing that there are signs. Deely proposes that textuality, not language is the specifically human capability that enables our understanding of semiosis and the discussion of it. This applies to both sciences and humanities, although such differentiation, as well as the discrimination between nature and culture, does not make sense under the conditions of an understanding of the semiotic potential in the life-world as a whole (Deely 2005: 103).

Even in the analysis of literature, which in itself is one of the most "artifactual" forms of anthroposemiosis, the connections with the rest of the world and with the semiosis that is going on there, can not be escaped. Quoting Danish literary scholar Jørgen Dines Johansen, Deely states that "experience of objects, actions, or events, similar to what is referred to in a given text, is a prerequisite to the understanding of it" (Deely 2005: 105).

In nature writing, the objects of natural world are in the centre of the narrative, as suggested by the common name of this type of texts. Literary depiction of natural objects is a problem that can not be solved solely with the tools available to literary theory, as it was indicated above. Also the approaches grounded in the "real world", such as environmental aesthetics, are not sufficient. Umwelt that is based on the cognitive map of the environment, is not reducible to the prejacent physical reality (Deely 2005: 104). There is always something surplus in human semiosic interpretation of the natural phenomena that is added to the object-world during the process. What exactly this additional layer is and how it can be pinpointed, is a research matter for ecosemiotics, the study of the sign relations between humans and nature, and of the communication between them (Kull 1998: 350). In the case of relations between humans and representatives of animate nature, such as birds, zoosemiotical approach comes into use. For example, inter-species' communication is one of the zoosemiotic topics that needs to be reflected upon in the framework of the analysis of nature writing.

The relevance of nature writing to semiotic studies has been advocated in several publications by Timo Maran (2007a, 2007b, 2007c, 2006). He has demonstrated that key concepts of ecosemiotics, such as contextuality, cultural mediation of nature, textuality, textualisation of

nature, and identity construction are all well represented in the texts of nature writing. On the other hand, nature writing provides a welcome set of source material for ecosemiotic analysis, as the imbalance in favour of theoretical studies against the applied ones frequently looms in semiotics (Maran 2007c: 65).

Nature writing has been outlined and studied so far mostly in the framework of ecocriticism, a branch of literary studies that has acquired institutional shape in 1980s. In the American ecocriticism tradition, nature writing has been defined as texts that are based on the author's immediate experiences of nature that are expressed in literary style (Buell 1995: 6–8). The main function of a piece of nature writing that differentiates it from fiction, is to direct the reader's attention towards the actual natural environment. This is accompanied with the need to have at least some knowledge about nature in order to understand the texts. Thus, nature writing serves directly pragmatic or political interests — its aim is to affect the readers' behaviour in the "real" world (Maran 2007c: 64). Nature writing often relies on or contains natural history information, likening it thus to scientific texts. However, as the production of such a text is firmly linked to the author as the experiencer, it also contains emotional interpretations of natural phenomena, as well as direct or indirect information about the beliefs and value systems that have shaped the author's particular response (Tüür 2007: 81). It is remarkable to note how much folkloristic material has been used in different accounts of birds in Estonian nature writing. This indicates that our Fenno-Ugric cultural roots are deep and have kept nourishing our understanding of the surrounding world until the 21st century.

In addition to personal approach and philosophical interpretation, the two above-mentioned criteria of nature writing by Buell, another American ecocritic Thomas J. Lyon emphasises that nature writing must contain reliable information on natural history (Lyon 2001: 20). This is a very important characteristic indeed, as nature writing should definitely not lie about natural facts, at least not in an intentional manner. It may easily happen that scientific facts that were taken as true some decades ago have proven to be false by our days. It must be considered, however, that the nature writers who have relied on their contemporary scientific data have done so in full faith. In the history of Estonian nature

writing, scientific reliability has always been one of the central concerns of the authors. This fact can be explained with the academic training in life sciences of the majority of our nature writers.

The reliance on scientific facts often leaves its traces to the structure of the pieces of nature writing, as Lyon (2001: 21) indicates. In such essays, a new paragraph is generally opened with presenting a scientific fact, followed by the explanation (or interpretation) by the author. As a result, the choice of words, syntax, and even the outline of the essay are more laconic compared with essays relying on purely subjective impressions. Lyon (2001: 23) also points out that the author's personal background and experience, as well as his/her position in relation with the observed environment play a role in structuring the essays.

According to Buell, a text of nature writing is most often structured in one of the following ways: as a seasonal chronicle, as episodes in an excursion, or as items in an inventory (Buell 1995: 421). On one hand, following one of such forms gives a clear organisatory principle to the text, but on the other hand, it induces fragmentation, especially when compared with the mainstream prose, that is, narrative fiction.

Inside nature writing as a genre, the typical ways of organising the texts may work differently than in the global context of belletrist literature. Whereas an over-exploited form becomes dull in narrative fiction or poetry, it may contribute to the meeting of readers' expectations in nature writing. As certain formats are repeatedly used in writing about similar things, the readers' responses grow more automatic; they are already able to extract a considerable amount of information from the pure form of the text. Such recognition conditions readers' expectations as to the content and message of the text — but also, if the initial expectations are not met, misreading and disappointment may result. We may guess that if a reader is interested in obtaining an emotional account of birds from a piece of writing, he or she would be mostly looking for texts that are organised as rambles. At the same time, in contemporary literary scene, a ramble is not a popular format at all.

Birds enjoy the position of a favourite subject matter of nature writing. Various technical modes used in the creation nature writing are well suitable for representing birds. The following account of the characteristic features of nature writing that support the appearance of

birds as subjects in the texts, is based on the first generalising study on Estonian nature writing (Tüür 2003).

As said above, nature essays often contain information similar to the inscriptions in biological field study notebooks: the exact dates, times, and toponymy related to encounters with the particular species; the information about the sex, age, behaviour, direction of flight, engagement in habitat, etc. of the individual, sometimes even the directions of how to get to the place of observation. All these items are routine information in professional ornithologists' field notebooks. It is easy to use the same format in nature writing, seasoning it with some personal comments and avoiding abbreviations, at the same time keeping to scientific viability. The essay *Sounds* by Fred Jüssi (1986: 27–28), part of which is later on analysed in more detail, is a nice example of such writing. The author describes a sequence of his predominantly audial spottings of birds at a certain location, a Western Estonian islet. The duration of the observation may have lasted no longer than a couple of minutes; the number of bird species mentioned is seven. About each of them, information about their current behaviour during the observation is given. Everything, except the poetic style of description, could well be jotted down into a field notebook.

Another common strategy is to focus one nature essay on one particular species, recalling a sequence of observations that may stand temporally apart, but that form a coherent whole in portraying the species or the particular individual bird. In Estonian nature writing, especially the older generation of nature writers (Põldmaa 1973; Lepasaar 1989; Jõgisalu 1974) has used this option. In addition, such one-species-centred nature essays usually provide the reader with scientifically apt biological-ecological information, even numeric data that is often drawn on scientific literature. It is not of little importance to note that the scientific sources are also directly referred to in such texts.

As nature writing inevitably has an ambition to be part of literature as "belles letters", it makes use of various stylistic devices and figures of speech: metaphors, metonymy, epithets, emphatic vocations, comparisons, parables, personal anecdotes, etc. Onomatopoeia is among the most important, alas equally controversial of the stylistic devices used in nature writing. However, in Estonian nature writing the onomato-

poetic rendering of bird calls is rarely arbitrary: it is most often based on our rich tradition of oral folklore that has some fixed and even today generally known formulas for most of our common song birds' songs.[1]

Folklore and its usage are certainly culture-specific, but nature writing is even more author-specific. As the direct contact of the writer with the nature forms the prerequisite of nature writing, the observations and comparisons are quite often literally person-dependent. For example, some bird sounds, for example, the high-pitched call of goldcrest, are inaccessible to elderly people whose hearing is in decline. Thus it is predictable that the species is likely to disappear from the aged nature writers' rambles, at least as a part of soundscape.

One more peculiarity of nature writing that makes it stand apart from fiction is its tendency to be illustrated. As sight is the primary channel of information for human species, it helps to relate the multisensorial source material of nature writing to the everyday experiences of the readers. In Estonian tradition, photographs are the most common way of creating an effect of intersemiosis in the books of nature writing (Tüür 2004). This stresses the strict correspondence between the text and the particular biological individuals in nature, as opposed to drawings that tend to generalise, typify, or even fantasise. Illustrations help to add an extra layer to the nature essays and thus appeal to these book-lovers who for some reason are not keen on thorough reading of essayistic or popular science texts, such as children.

In his recent writings, Timo Maran has discussed at length the concept of nature-text, a complex set of meaning relations between natural environment and the texts of nature writing that result in certain resemblances between its two components. "The relations between the written text and natural environment operate similarly to the relation between two interconnected texts or a text and its context, where the interaction significantly shapes the possible interpretations of the text," Maran writes (2007a: 280). In the analysis of nature-texts, Maran sees three principal directions of investigation. The first option would be to study the different structural and communicative connections present in nature, as they are observed in the field by the nature essayist, and are

[1] Even a child would know that the thrush nightingale sings in Estonian about a lazy girl who needs to be encouraged to work by slapping the whip.

later represented in written text. Secondly, it is very significant, which parts of the nature are given or not given a voice and/or subjectivity in the text. This indicates which are the values for the writer; how is the human semiosphere positioned in relation to non-human (foreign) semiospheres, and which strategies are used in order to overcome the communication barriers between different species. The third way is to follow the correspondences between the text and the landscapes it embraces. Most usually temporal or spatial sequence is used in structuring a nature essay in respect to the environment it refers to. (Maran 2007c: 66).

An interesting illustration of the possible functioning of nature-text as a complex unity where human textuality influences natural organization and vice versa is an example provided by Salwiczek and Wickler (2004: 170). Discussing the traditive songs of some bird species, they write about a European traditional custom of teaching hand-raised bullfinch nestlings whistled melodies of folk songs. The birds are able to teach them to their offspring without further human intervention. On the other hand, the melody that is to be taught by the human tutor needs to be carefully chosen in order to fit the natural range of bullfinch song in duration, pitch, and rhythm. In this case, in one direction, elements of human culture were inserted into the birds' Umwelt. In the opposite direction, this tradition may have conditioned the repertoire of local folk songs through the necessity to have songs suitable for bullfinches available in the common culture.

The general points for discussing nature writing proposed above are macro-level observations. Studying bird sounds in nature writing requires also micro-level analysis; otherwise a number of textual features, as well as their respective counterparts in natural environment, may be dismissed. In the following, two rather small excerpts of nature writing by two major Estonian 20th century nature writers serve as the source for analysis. My attempt is to show that quite simple nature-texts may be semiotically significantly multi-layered, and that they prove to be a worthwhile material of study for eco- and zoosemiotics, casting light from one certain angle on the mechanisms of human–non-human communication.

4. Textual bird sounds

The first attempts to apply semiotic methods to the study of natural phenomena can be traced back to early 1960s. Already in 1961, Peter Marler uses the four categories outlined by one of the ground-layers of semiotics, Charles Morris, namely identifiers, designators, prescriptors, and appraisors, in classifying the types of information exchanged in animal communication (Marler 1961: 301). In 1963 Thomas A. Sebeok suggested that ethology should be studied semiotically, as zoosemiotics (Sebeok 1963: 448–466). From there on, animal communication, including communication of humans with other animals, has been studied using semiotic methodology. Sebeok's works are among the most outstanding achievements in this field until the present day.

As the Umwelts of all species are constructed and maintained differently, using different perception organs and channels, and driven by different needs, it is not possible to assume that the signals emitted by what ever individual should be meaningful to any other individual. Therefore, it is necessary to make a distinction between communication and signification (Martinelli 2007: 28; Maran 2007b: 42). The first describes a situation where both sender and receiver share a considerable amount of the principles determining the form, the rules of codification, and the context of the messages. This sort of interaction is usual in intra-species' communication, such as human language, for example. In the other case, the semiosis resembles the way inanimate environment is interpreted by a living creature. (Maran 2007b: 42). Both instances of communication as well as of signification can be found in nature writing, describing human encounters with other animals.

The present analysis of nature writing makes use of the six categories of signs outlined in Sebeok's book *Signs: An Introduction to Semiotics* (Sebeok 1994). The six categories appear to be a typological generalisation of "the types of signs most regularly identified and commonly employed by semioticians" (Sebeok 1994: 17). In the book, each of the six types is provided with a brief history of the identification of the genus, its distinctive traits, and some examples of the dominant appearance of the particular aspect of the sign. The aspects of signs proposed by Sebeok are based on the threefold typology of signs outlined by the currently most widely acknowledged guru of semiotics,

Charles Sanders Peirce, namely icon, index, and symbol. Sebeok mentions that Peirce's elaborated list of signs consists of sixty six varieties, but the six categories presented by him take into account also the legacy of many other semioticians, and aim at providing a system that would be applicable to a wider area of research than merely human communication; in his own designation, zoosemiotics (Sebeok 1994: 20). Sebeok lists the six "species" of signs to be discussed further in the text: signal, symptom, icon, index, symbol, and name. Sebeok reminds the reader that all signs are relational and contain the different sign aspects simultaneously. Each of its aspects may dominate others in any of the particular cases of signifying — "aspects of a sign necessarily co-occur in an environment-sensitive hierarchy" (Sebeok 1994: 21).

Before proceeding to the detailed discussion of the sign types, Sebeok introduces the category of zero signs, that is, the situation where the very absence of a sign itself is significant (Sebeok 1994: 18).[2] In Estonian nature writing, an essay titled *Silent Spring* by Fred Jüssi provides a beautiful example of such "zero significance": it describes a warm spring day that suspiciously lacks any bird sounds (Jüssi 1986: 21–22). As the text proceeds, it turns out that the exceptionally warm day has occurred in the middle of the winter, so that the absence of song birds is only natural. Still, the point of the strong signifying power of silence and absence of sounds is made with great persuasiveness.

The first excerpt of nature writing studied in depth in the light of the six major aspects of a sign is part of the essay collection *Wagtail* by Fred Jüssi (b. 1935). Jüssi graduated from University of Tartu as a field biologist, and for most of his life has worked as a freelance radio journalist, taping different sounds of nature and commenting them in radio broadcasts. His work has enjoyed wide popularity. The essay *Sounds*, dated 1976, describes an instance of early spring evening observation of seabirds on an islet near Hiiumaa. Jüssi writes,

> A small flock of goldeneyes flies across the islet with their wings whistling. Here one gets used to the whistling of the goldeneyes, one does not even notice it any more, but in the inland woods and moors, it is one of the most beautiful sounds of a spring night. The scream of a fox in a

[2] This is a widely used poetic device known in literary studies, too; especially employed in free verse.

> February night makes one feel like responding to the call, but in the whistling of the wings of goldeneye, the haste of someone driven by longing for home is hidden. At least, this is how it has seemed to me at nights spent in the woods by a campfire. (Jüssi 1986: 28)

In this description, a bird sound, not a call or a song is at stake. The goldeneye's (*Bucephala clangula*) whistling sound is a side-effect of the bird's movement through air; the sound mechanically results from its wing beats. Ducks and heavier birds, such as swans, all make noise with wings while flying because of their heavy bodily constitution. Juvenile goldeneyes who do not possess stiff feather tips yet, do not produce this flight sound, but it is especially loud in male goldeneyes during winter and spring. There is no evidence whether the whistling flight itself is a distinctive feature in goldeneye's sexual selection or not. Deely remarks that "Within experience, the status of objects not designated to be signs with other objects so designated is peculiarly unstable, not because of the deficiency in the sign, but because of an instability in the status of the object as such" (Deely 2005: 79). In human Umwelt, the flight noise of goldeneye is constantly objectified among naturalists who need to recognise it in order to be able to identify the species. Therefore, Deely's logic of the distinctiveness of human semiosis (Deely 2005: 80) applies here: the signifying relationship itself is objectified and given the dimension of stipulability which enables its further repeated usage as a sign.

The flying noise produced by goldeneye is remarkably beautiful for human ears, whereas its actual sight of flight is not gracious at all. "Flight rapid but appearing laborious," the Collins *Bird Guide* states (Collins 1999: 66). However, listening very often allows much more poetic imagination than on-looking. It can be proved by looking at the goldeneye flight sound's descriptions in various bird guides. In Collins (1999: 66), it is described as *loud, musical whistling*; in the Estonian translation of Jonsson's *Birds of Europe* (Jonsson 2000: 116) as *characteristic chiming swish*. The Ukrainian bird guide (Fesenko, Bokotei 2002: 82) takes the sub-section 'call' literally, and only mentions the goldeneye's courting call, but says nothing about the wing-beat-sound, evidently not classifying it as a call. At the same time, this sound is by which the goldeneye is most commonly identified, as the voice of the goldeneye resembles other ducks and is seldom heard by humans

because the flocks normally spend most of their time on open sea far off the coast.

An intensely poetic description of the goldeneye's flight sound can be found in an Estonian bird guide that combines zoological information with records from Estonian folklore. It reads: "In flight the wingbeats create a peculiar 'bljübljübljü'-whistling, as if a pebble cast onto and gliding on the surface of young ice" (Mäger 1994: 273). The prerequisite of understanding the beauty of this comparison, however, is a personal experience of throwing pebbles onto young ice and of the resulting sound.

Mäger also remarks that goldeneye's migration can be followed even in dark, thanks to its swishing flight that makes it audible. That is exactly what Jüssi's story takes an advantage of. More generally, this observation indicates the vital role of sounds in both nature observation and in nature writing: it makes other species accessible to human perception in the conditions where sight is blocked for some reason. Other sensory channels, such as touch, smell or taste, tend to have but marginal importance in identifying other species by modern humans. In the context of zoosemiotics and inter-species' communication, Sebeok points out that by using multiple sensory channels simultaneously or in succession, the risk of errors in reception is minimised (Sebeok 1994: 9).

Goldeneyes as the birds of passage that are performing their routine spring migration definitely do not make their wing beat noise deliberately, nor do they have any intention to announce their presence by this sound. It is probable that other waterfowl would pay attention to the flying noise of goldeneye only if it was preceded by sudden take-off noise, thus indicating that something, like an approaching predator, has disturbed the leaving birds. Timo Maran draws attention to the fact that in human interaction with the non-human life-world, the communicational situation is often somewhat "deficient" in comparison with the model communication situation based on human language. The specific addresser may not be known, or it may be absent, or the addresser and the addressee are principally different because of their affiliation in different species with barely overlapping Umwelts. (Maran 2007c: 62). Here, again, the distinction between communication and semiosis becomes handy. In many cases, the human perception of non-human environment may be thus classified as semiosis, not communication.

For a human, as well as for a non-human hearer of the goldeneye's flight sound, it is in first order a mere signal. Signal is defined as "a sign that mechanically (naturally) or conventionally (artificially) triggers some reaction on the part of the receiver" (Sebeok 1994: 22). Verbal communication has the signal-aspect underneath the symbolic function, too. If we do not understand the language of the utterance, or the speaker's intention, if we can not tell apart the words, etc, as is normally expected in human intra-specific communication, an utterance or text may well function as a mere signal for us. The same is true in inter-specific communication — for example, we may be able to smell a weird scent produced by a bug, but we do not understand its message. The presence of an olfactory signal is still a fact. As the whistling of a goldeneye's wings can be heard by humans without any special equipment (unlike the ultra-high sounds produced by bats, for example), it can be defined as a signal in human Umwelt even if the listener does not have a slightest idea about the source of the sound. Sebeok remarks that "signal" is most commonly used term about any animal behaviour in animal communication studies. As such, it attempts to be a neutral, technical term that does not imply anything about the possible meaning of the signalling behaviour, neither in the animal's own Umwelt nor in humans' interpretation.

It is quite evident that for the birds, in both intra- and inter-specific communication, the sounds that they produce, function at least as signals. In reductionist language, bird song can be explained as triggered by neuro-chemical reactions to the environmental changes, such as prolonging of the days (Mänd 1998: 16–17). In discussing the impact of a male chaffinch's song on a female chaffinch, Marler states that it can not be proven that the song has any meaning for the female, but only that a certain input of information performs selective actions upon her (Marler 1961: 301). In case of such interpretation, the notion of "symptom" should be used, understood by Sebeok, on the basis of Peirce, as an instance of index, a non-arbitrary sign that does not require an intentional sender (Sebeok 1994: 49). Goldeneye's wing noise is a symptom of its condition. However, it is highly probable that in a bird's Umwelt there would be *meaningful* to distinguish one's con-species from the rest of the animate and inanimate environmental stimuli, to realise them as a qualitatively different group towards whom the

singing activity could be directed. Whether the further decisions — to utter an alarm call, or a mating call, or a flock call — can be considered intentional or reflective, must remain an open question here. As Sebeok (1994: 4) has warned, we can not understand the world, or the process of semiosis from outside of the confines of our human Umwelt.

A possible solution to this problem is provided by Timo Maran who in his development of Sebeok's zoosemiotic communication theories, presents two models of cyclical communication, one by Wilbur Schramm and the other by Jakob von Uexküll (Maran 2007b: 43). According to Schramm's model, it is not necessary that the messages sent and interpreted by the participants in the communication should use the same sign system or the same communication channels. In case a signal is received by the sense organs of another individual, it interweaves the communication cycles of the sender and the receiver regardless of the fact whether the signal was meant to be sent or received by the particular individuals engaged in the process. Martinelli points out that there are two different phenomena, intentionality and the awareness of the intentionality, that should not be confused (Martinelli 2007: 21). In human semiosis, the awareness of intentionality is generally present alas it does not govern all our actions. Many actions in humans are taken without a clear perception of their intentionality, although they certainly are meant to be performed by the particular individual. It is probably true in the case of non-human animals, too. Deely writes that the more complex levels of semiosis necessarily continue to operate on the basis of the previous levels (Deely 2005: 124). In the present instance, we can conclude that on one elementary level, bird calls in nature are signals. A trivial sentence like "Birds are singing" is a textual reflection of the human observation of a signal.

Proceeding along with the different aspects of a sign, indexicality is to be discussed next. Index, as Sebeok explains, is related to its source directly, thus being a witness of presence (Sebeok 1994: 65). There is an existential connection between the sign and its source. Therefore, intentionality is not necessary for an indexical sign. He also points out that natural sciences in general work empirically by first detecting indexes and then interpreting them (Sebeok 1994: 74). This is a very important remark in the context of the present study, as it gives a hint about the basic text production mechanism of nature writing.

Sebeok (1994: 69) reminds that the indexical presence need not appear as spatial proximity. In case of bird sounds, proximity is inevitable, but it is temporal, not spatial. Sounds produced by sources (birds) in motion, often fade faster than visible indexes, but the case may be opposite, too, like in the passage under our study. The whistling wing beats of goldeneyes indexically mark their presence in the dim night of early spring when the observation described by Jüssi takes place. The narrator is not able to see the birds, nor is there any visible index of the birds (such as a dropped feather, footprints, etc.) referred to. The audial index is predominant, and it lasts for a considerable period of time, so that the human protagonist even has time to elaborate the index into a symbol in his mind. For a human listener with some ornithological experience, the whistling is an index of the presence of male goldeneyes in migration flight. Here, it is important to remind that listening in general enables human interpretation within wider limits than seeing — thus, of course, creating more possibilities for misunderstanding and misinterpretations, too.

In the wildlife, the song, or any other sound produced by a bird then functions as an index. It is much more common that a bird is heard rather than spotted in the field. In Estonian folklore, metaphoric descriptions of bird sounds are much more frequent than comments on their appearance (see Hiiemäe 1996–1997). Most of the birds do not display themselves very readily, or their looks are just very modest, or they are located somewhere (normally high or far) where it is difficult to see them without special equipment. Singing or any other sound that can be associated with a bird serves as an indexical sign of its presence. Identifying the source of the audial index requires experience. Misinterpretation of a (bird) sound as an index of a live creature's presence in proximity may simply result in a false assumption, but also in horror and panic in more grave cases. The culturally conditioned fear-seasoned attitude towards owls, for example, may be pointed out as an example of such misinterpretations, firmly rooted in ancient as well as in the modern folklore. As some owl species' mating calls (owls' mating usually takes place in February and March) resemble the cry of a baby, misinterpreting the sound as an index of the presence of a small child in a remote area during a cold winter night instead of an index of a predatory bird may cause anxiety indeed.

The next important aspect of a sign that is often present in nature writing — but not only there — is iconicity. Sebeok (1994: 86) surprisedly notes the often-encountered deliberate confinement of understanding of iconicity to visual modality only. He assures that iconicity is present in numerous multi-modal forms in human and other animal existence in everyday life. Bird songs appear as audio icons in literature, both in field guides' scientific descriptions and in nature writing where the onomatopoetic imitations of the bird calls often rely on folkloristic conventions. Recognising such iconic relation requires vivid audial imagination or reading the respective textual representations aloud, in order to identify them as icons. The recognition is made more complicated because of the different transcription and pronounciation rules in different languages, but also because the bird species themselves have regional differences in their calls.

The words "vilin"[3] and "whistling" used for describing the sound of goldeneye's movement are in themselves iconic, inasmuch as they both have strong onomatopoetic basis. The phoneme "i" marks the high pitch of the sound, "v/w" refers to the sound of wing tips' moving through the air. The trouble with the ornithological, scientific rendering of the sound can be illustrated with the transcription "bljübljübljü" in Mäger (1994: 273), to which also the word "vilin" has been added, in order to make sure, which type of sound is described.

Peter Marler makes a distinction between continuously variable and stereotyped signals (Marler 1961: 309–312). He indicates that the former are suitable for conveying information about various environmental conditions, whereas the stereotyped signals are important in communicating species-specific and individual information. The latter may frequently override the need to signalise about the surrounding conditions (Marler 1961: 312). In stereotyped signals, iconicity plays an important role. Such an example of iconic rendering of a bird sound in Estonian nature writing comes from Professor Johannes Piiper's collection *Pictures and Sounds of Estonian Nature* (first issued in 1935, reprinted in 1975). Piiper, a long-time Professor of Zoology in University of Tartu, was known for his habit to make field notes, adding to them comments on the aesthetic aspects of the observed natural

[3] "Whistling", "swishing" in Estonian.

phenomena. From this material stem his numerous nature essays that form the canonical core of Estonian nature writing. His essays are always dated and the locations indicated with great preciseness.

The following excerpt is from a piece titled *On road to Riga and around Konguta, 01.06.1936*.

> Like silver pellets being dropped into a glass bowl, the chiffchaff song's syllables, simple and cordial, sound from the high crown of a fir tree. (Piiper 1975: 269)[4]

The voice of the bird (*Phylloscopus collybita*) whose English name chiffchaff is derived on the onomatopoetic basis, as well as is the case in many other languages (Finnish *tiltaltti*, Estonian *silksolk*, German *Zilpzalp*, Dutch *tjiftjaf*), is depicted in three different bird guides as follows:

English (Collins 1999: 306): "Song a *slow and measured* series of well-spaced clear, forceful, *monosyllabic* (exceptionally disyllabic) notes on *two or three pitches*, 'silt sült sült sult silt silt sult sült sült silt…' Birds newly arrived at breeding site add a muffled 'perre perre' between verses."

Estonian (Jonsson 2000: 450): "Song monotonously tinkling [like a wooden sheep bell — K.T.] 'tsilt, tsalp, tsilt, tsalt', among which there is now and then a quiet 'tsr tsr'."

Ukrainian (Fesenko, Bokotei 2002: 294): "Song — repeated monosyllabic 'tinj-tjan-tenj', intermittent call — silent, soft 'f'juiit'."

The regular territorial call of chiffchaff has evoked a number of explanations in the folklore. The iconic qualities of the song have resulted in a number of vivid comparisons, some of which are briefly accounted in the following. The Latin name for chiffchaff '*collybita*' means 'money exchanger' — as an analogy to the sound of the coins being dropped and counted. In German, the name '*Zinzahler*', the interest payer, is known (Mäger 1994: 94).

The bird is believed to forecast rain in Estonian folklore, because of the iconic similarity of its song to falling of raindrops. Therefore it has been called "rainbird", "rainfinch". A folk story about the origins of

---

[4] In Estonian: „Nagu klaasanumasse langevaid hõbekuulikesi heliseb kõrgest kuusekroonist väike-lehelinnu laulusilpe, lihtsaid ja südamlikke."

chiffchaff's song goes that the bird learnt it from a horse whose droppings fell into a puddle. Another version is that the bird borrowed its song from a maid who was milking a cow, as it was late to the occasion where all birds were delivered their songs, thence "milker bird", "cow bird". The third iconic sound analogy in folklore is made with a blacksmith's hammering sound — chiffchaff is "cuckoo's smith", "small smith", "cuckoo's shoer", also "cuckoo's farmhand", as it is often feeding cuckoo's offspring in its nest. Sebeok remarks that the human process of name-giving to other animals has strong tendency towards iconicity (Sebeok 1009: 90). Such "cultural labelling" creates a possibility for easy memorising and a certain intimacy between humans and the other animals named.

Besides the question of resemblance, the question of aesthetic and ideological choices rises in the case of audial iconicity. Piiper's description of the chiffchaff's song as "silver pellets being dropped into a glass bowl" has a strong visual appeal besides the audial one. In that regard, it could even be classified as a symbol, rather than an icon, although there certainly are iconic qualities to this description. The image of a glass bowl and silver pellets reminds of somewhat bourgeois interior settings, supporting Piiper's overall tendency to aesthetisation in his nature essays. As such, this image even reminds of Sebeok's proposed "fetish signs" that overlap, according his definition, with several sign categories: these are predominantly indexical signs that signify metonymically and that are intermingled with both iconic and symbolic elements (Sebeok 1994: 101). In the chiffchaff's case, the song indeed stands indexically for the bird's presence upon a fir tree beside the road. The fine sound description renders the writer's sympathy to the bird and its song (characterised as "simple and cordial"). The description is symbolic as the song is associated with luxury items (glass bowl, silver) that should add a sense of value to the sound, and probably also refer to the author's own value preferences[5].

Actually, Piiper is not alone in his aesthetisation attempts in Estonian nature writing. A description of a chaffinch's song by his

[5] Note that Piiper has substituted the folkloristic horse droppings and a puddle referring to agricultural settings with silver pellets and a glass bowl, implying city culture.

contemporary, an Estonian artist and naturalist Ants Murakin, also uses the imagery of glass and silver, but finally opts for pure natural water: "It is interesting to follow how the tiny bird after each four or six resonant syllables — tsilk-tsolk, tsilk-tsolk — gives two syllables in equal height and sound, tsilk-tsolk tsolk… Exactly like the dripping of water sometimes alters its sound." (Mäger 1994: 93).[6]

From the iconic resemblances, it is but a small step to symbols, as the quotations and their analysis above have already demonstrated. Deely notes that one peculiar trait of human semiosis is its ability to transcend the biological heritage anchored in the physical world, and to operate on a purely imaginary and/or abstract level (Deely 2005: 84). He terms it the ability for textuality, a phenomenon that enables reconstitution of the human Umwelt to a degree that no other species is able to reach. Whether the consequences of such ability are favourable in the evolution and survival of the species or not, is already a different question.

In the case of the goldeneye as well as of the chiffchaff, the textual representations of the sound imply audial iconicity and the on-site felt presence of the song, resp. singer in addition to the symbolic value added to the sound by the authors. This conforms to Sebeok's claim that "A given object can, depending on the circumstance in which it is displayed, momentarily function, to a degree, in the role of an icon, an index, or a symbol." (Sebeok 1994: 67). In human artistic interpretation both indexical and iconic representations tend to acquire strong symbolic character that overrides the previous aspects of signs that Sebeok terms "natural", as opposed to "symbol, which is in the conventional mode, or reflective of a relation that is characterized by an imputed quality" (Sebeok 1994: 81–82).

In Piiper's case, the symbolic value of the bird sound lies in its description as a phenomenon that combines luxury with simplicity, adding to the overall solemn atmosphere of the essay. The symbolic aspect is directly related with human feelings in the landscape and in the soundscape. The bird itself is not attributed any symbolic aspirations;

---

[6] In Estonian: „Huvitav on jälgida, kuidas tilluke lind peaaegu iga nelja või kuue vahelduvalt resoneeriva silbi — tsilk-tsolk tsilk-tsolk — järel taob kaks korda ühekõrguselt ja samaheliliselt: tsilk-tsolk-tsolk… Nagu vee tilkuminegi muudab vahel oma heli."

only the impact of the sound to the particular human listener's mental state is described. In Jüssi's *Sounds*, the wing beat sound's predominant aspect of indexicality is fast elaborated into a symbol in the text: first, it is compared to a fox's cry, and then it is attributed human feelings, such as longing, homesickness, haste. The author, as a trained biologist, is aware that it is not appropriate to incriminate these feelings to the birds themselves. So in this passage, the presence of the flight sound is revealed in two parallel aspects, as an index (related to birds) and as a symbol (related to humans).

"We may note that evolution from iconic to arbitrary signals is probably a quite common occurrence, as part of the process known as ritualization," Marler states in the conclusion to his article on animal communication (Marler 1961: 316). One of the exemplary moves towards arbitrariness is the usage of names, the last type of signs treated by Sebeok. He explains that all animals broadcast a steady stream of identifiers, that is, signs indicating their affiliation in a certain species, sex, social rank, reproductive status, etc. Many bird species have special sequences of sounds that are characteristic to one individual bird and that thus enable to identify birds also on the level of an individual (Sebeok 1994: 38). Through individual learning, a sound or a sound sequence is established as characteristic of one individual only, thus starting to function as a proper name for that individual and its group members. Names, understood as the traits specific to one individual only, may be olfactory, acoustic, optical, or related to appearance (Sebeok 1990: 81).

In our first example under study, the phenomenon of name is probably not applicable, as the wing beats most likely do not convey personality to the same degree as territorial songs of song birds. In humans, we may be able to tell a person by his or her footsteps, but it is dubious to claim anything like this about birds' wing beats (although the capacity to recognise other individuals on the basis of their habitus exists in animals). As Sebeok (1990: 82) indicates, individual recognition based on specific traits in songs, calls, and the so-called signature tunes, exists among birds. The great energetical advantage of using proper names has been pointed out already by Marler in 1957: "To ensure that the signal shall evoke a response from the biologically appropriate individual, specific distinctiveness is often an advantage"

(Marler 1957: 14). Salwiczek and Wickler repeat this idea, stating that the ability to address particular individuals is a major advantage over anonymous signalling, because both signalling and being attentive and responding to a signal are costly behaviours. A receiver should not react to a signal unless it is in his interests. The sender's expected benefit, in turn, would rise from the responder's reaction. (Salwiczek, Wickler 2004: 173).

In chiffchaff, it is probable that its song would contain sequences or passages unique to this particular individual. From this excerpt it does not become evident, however, in what respect would the described bird's song differ from his con-species' males in the same region. It may be assumed, though, that it has its individuality. The problem of recognising it may well lie in the human sensory apparatus that is not able to distinguish the minor individual-specific traits in bird song in brief listening. It is easier for us in the case of species with more complicated songs, and with a greater tendency to imitating or incorporating foreign sounds in their song (such as starlings or reed warblers, for example).

Sebeok distinguishes between cultural and natural individuation (Sebeok 1990: 88). The individual-specific sounds or olfactory signals are examples of natural individuation. The notion of cultural individuation is illustrated with the practice of naming animals by humans. That process goes back to Biblical times ("[…] whatever the man called each living creature, that was its name", as is written in the Genesis). The animals that are to be incorporated in the human culture, the "non-natural sphere", are usually given proper names. Often these are arbitrary, although they can also be based on the particular species' typical call, or on some local cultural conventions. The naming of non-human nature is a problem that would definitely need a more thorough ecosemiotic analysis, outside of the present zoosemiotic framework of the treatment of bird sounds in nature writing.

5. Conclusion

Human interpretation and textual rendering of bird sounds is a topic that has seldom been subject to literary studies. The group of texts

commonly designated as nature writing has been researched in the framework of ecocritical studies. In many studies, the emphasis has been on ideological implications of the depictions of nature. With the tools provided by general literary criticism dealing predominantly with symbols, it is possible to treat only the "top of the iceberg" of the texts of nature writing. Semiotic approach enables us to open up more layers in a piece of nature writing, and may contribute to our greater overall understanding of the non-human world.

The problem, whether signs produced in one species' Umwelt can be meaningful in the Umwelt of another species, can be overcome by recognising the ubiquity of semiosis, as proposed by Sebeok and Deely. The difference must be made between intentional communication and semiosic activity that goes on regardless of anybody's will. The signs that transcend one animal species' Umwelt inevitably become at least signals in the perceiver's Umwelt. Depending on the situation, they can also become symptoms, indexes, icons, symbols, or names. The analysis of examples from Estonian nature writing shows that all these categories can be detected in the study material.

In a number of aspects, bird song is both functionally and structurally parallel to human language, as a number of outstanding life scientists have demonstrated. Deely argues that it is not so much language, but textuality that is a specifically human ability. Textuality enables us to take a distance and to model the world in extremely supple and multiple ways. Regarding nature writing as one such attempt that is still firmly rooted in physical reality, it is possible to follow and detect a number of transformations that a bit of information, such as a bird sound, undergoes when it is perceived and interpreted in human context. Such an analysis may eventually help to cast light to the processes of natural selection, as well as to our understanding of the possibilities of communication with the non-human world.[7]

[7] This article has been written with the support of the Estonian Science Foundation grant no 7790. This research was supported by the European Union through the European Regional Development Fund (Center of Excellence CECT).

References

Bachelard, Gaston 1969. *The Poetics of Space*. Boston: Beacon Press.

Buell, Lawrence 1995. *The Environmental Imagination. Thoreau, Nature Writing, and the Formation of American Culture*. Cambridge, London: The Belknap Press.

Collins 1999 = Mullarney, Killian; Svensson, Lars; Zetterström, Lars; Grant, Peter J. 1999. *Bird Guide*. London: HarperCollins Publishers.

Deely, John 2005. *Basics of Semiotics*. Tartu: Tartu University Press .

Fesenko, Gennadi Vassiljevich; Bokotei, Andrei Andrejevich 2002. *Ptahi fauni Ukraini* [Birds of the Ukrainian Fauna]. Kiev: The Ukrainian Bird Protection Society.

Gill, Frank B. 2007. *Ornithology*. New York: W. H. Freeman and Co.

Hiiemäe, Mall 1996–1997. Nelikümmend lindu eesti rahvausundis [Forty Birds in Estonian Folk Belief]. *Mäetagused* 1/2:7–23; 3: 7–18; 4: 7–19; 5: 7–22.

Ingersoll, Ernest 1923. *Birds in Legend, Fable and Folklore*. New York: Longmans, Green, and co.

Jonsson, Lars 2000. *Euroopa linnud* [European Birds]. Tallinn: Eesti Entsüklopeediakirjastus.

Jõgisalu, Harri 1974. *Nõiutud allikas* [Enchanted Spring]. Tallinn: Eesti Raamat.

Jüssi, Fred 1986. *Jäälõhkuja* [Wagtail]. Tallinn: Valgus.

Kroodsma, Donald E.; Miller, Edward H.; Ouellet, Henry (eds.) 1982. *Acoustic Communication in Birds*. New York: Academic Press.

Kull, Kalevi 1998. Semiotic ecology: different natures in the semiosphere. *Sign Systems Studies* 26: 344–371.

Lepasaar, Juhan 1989. *Laaneteedel* [On Forest Paths]. Tallinn: Valgus.

Lutwack, Leonard 1994. *Birds in Literature*. University Press of Florida.

Lyon, Thomas Jefferson 2001. *This Incomparable Land. A Guide to American Nature Writing*. Minneapolis: Milkweed Editions.

Maran, Timo 2006. Ökosemiootika, looduskirjandus ja liikidevaheline kommunikatsioon [Ecosemiotics, nature writing and communication between species]. *Semiootika piirid. Boundaries of Semiotics*. Konverentsi teesid. Conference abstracts. Tartu: Tartu University Press, 25–28.

— 2007a. Towards an integrated methodology of ecosemiotics: the concept of nature-text. *Sign Systems Studies* 35(1/2): 269–294.

— 2007b. Liikidevaheline kommunikatsioon ja Thomas A. Sebeoki uurimisplatvorm [Inter-species' communication and the research platform of Thomas A. Sebeok]. *Kommunikatsiooni teooria. Schola Biotheoretica*. Tartu: Eesti Looduseuurijate Selts, 36–47.

— 2007c. Ökosemiootilise analüüsi perspektiivid: loodusteksti mõiste [Ecosemiotic method in the analysis of texts of nature]. *Acta Semiotica Estica* IV: 48–72.

Marler, Peter 1957. Specific distinctiveness in the communication signals of birds. *Behaviour* 11(1): 13–39.
— 1961. The logical analysis of animal communication. *Journal of Theoretical Biology* 1: 295–317.
Martinelli, Dario 2007. *Zoosemiotics: Proposals for a Handbook*. Helsinki-Imatra: ISI
— 2005. Sissejuhatus antropoloogilisse zoosemiootikasse. Inimeste ja teiste loomade vahelise suhte semiootiline käsitlus. [Introducing anthropological zoosemiotics. A semiotic approach to the human–other animal relationship]. *Acta Semiotica Estica* II: 135–152.
— 2002. *How musical is a whale? Towards a theory of zoomusicology*. Helsinki-Imatra: ISI.
Mäger, Mart 1994. *Linnud rahva keeles ja meeles* [Birds in the Folk Language and Lore]. Tallinn: Koolibri.
Mänd, Raivo 1998. *Elukunstnikud* [The Art of Life]. Tallinn: Huma.
Piiper, Johannes 1975. *Pilte ja hääli Eesti loodusest* [Pictures and Sounds from Estonian Nature]. Tallinn: Eesti Raamat.
Põldmaa, Kustas 1973. *Koduvetel* [On Native Waters]. Tallinn: Valgus.
Rowlett, John 1999. Ornithological knowledge and literary understanding. *New Literary History* 30(3): 625–647.
Salwizcek, Lucie H.; Wickler, Wolfgang 2004. Birdsong: An evolutionary parallel to human language. *Semiotica* 151(1/4): 163–182.
Sebeok, Thomas A. 1994. *Signs: An Introduction to Semiotics*. Toronto and Buffalo: University of Toronto Press.
— 1990. *Essays in Zoosemiotics*. Toronto: Toronto Semiotic Circle.
— 1963. Communication in animals and men. *Language* 39: 448–466.
Turnbull, A. L. 1946. *Bird Music. An Introduction to the Study of the Vocal Expressions of British Birds with Appreciation of Their Songs*. London: Faber and Faber Ltd.
Tüür, Kadri 2003. *Eesti looduskirjandus: määratlus ja klassifikatsioonid* [Estonian nature writing: definition and classifications]. University of Tartu, Department of Semiotics. M.A. thesis. Manuscript.
— 2004. Nature writing and intersemiosis. *Intertextuality and Intersemiosis*. Tartu: Tartu University Press, 151–167.
— 2007. Looduskirjanduse määratlus [Definition of nature writing]. *Acta Semiotica Estica* IV: 73–96.

Птичьи звуки в литературе о природе: человеческая перспектива в животной коммуникации

В статье рассматриваются птицы, точнее пение птиц, как оно представлено в эстонской литературе. Обсуждаются эволюционные и

структурные параллели между пением птиц и человеческим языком. Человеческая интерпретация птичьего пения ставит вопрос о возможности перенести или «перевести» сигналы между умвельтами различных видов. Намерение посылающего сигнал может остаться неизвестным, но процесс сигнификации в человеческом умвельте может быть прослежен и анализирован. Используя семиотическую методологию я рассматриваю отрывки из литературы о природе и пытаюсь показать, как птичьи звуки могут функционировать в качестве разных типов знаков (по Томасу Себеоку). Я утверждаю, что зоосемиотическое рассмотрение литературы о природе открывает интересные перспективы, которые остаются за рамками традиционного анализа литературы.

Linnuhääled looduskirjanduses: loomade kommunikatsioon inimeste nägemuses

Käesoleva artikli uurimisobjektiks on linnud eesti looduskirjanduses, täpsemalt lindude poolt tekitatud häälte kujutamine neis tekstides. Linnulaulul ja inimkeelel ilmneb nii evolutsioonilisi kui struktuurilisi sarnasusi. Inimese poolt linnuhäältele antavad tõlgendused tõstatavad küsimuse, kas on võimalik edasi anda või "tõlkida" signaale erinevate liikide omailmade vahel. Signaali saatja kavatsus võib jääda väljapoole meie teadmiste ulatust, kuid selle poolt inimesele omases omailmas tekitatavaid märgiprotsesse on siiski võimalik tuvastada ja analüüsida. Lähenedes katkendeile looduskirjandusest semiootiliste meetoditega, püüan näidata, kuidas linnuhääled võivad toimida eri tüüpi märkidena, nagu neid on eristanud Thomas A. Sebeok. Looduskirjanduse zoosemiootiline analüüs avab mitmeid huvitavaid perspektiive, mis traditsioonilisi kirjandusuurimise meetodeid kasutades jääksid ilmselt tabamata.

IV

Tüür, Kadri 2014. Like a fish out of water: Literary representations of fish. In: Kadri Tüür, Morten Tønnessen (eds.), *The Semiotics of Animal Representations*. Nature, Culture and Literature, 10. Amsterdam, New York: Rodopi, 263–288.

Like a fish out of water: Literary representations of fish

Kadri Tüür

Literary representations of fish have not enjoyed much critical attention until recently. In the present chapter, the literary depiction of human–fish interaction in angling situations is analysed from a zoosemiotic perspective. Two models are applied to enable a detailed discussion of the different sign types and of the different aspects of communication that occur in interspecies communication involving humans and fish. A brief overview is given of the relevant semiotic and ecocritical literature. Also reviewed are the basic elements of fish biology that are crucial in the fish Umwelt when it encounters a human Umwelt.

1. Introduction

The present chapter focuses on analysis of the literary representation of fish, with Estonian nature writing as its textual basis and semiotics as its main theoretical framework. Ecocriticism acts as the common ground that supports bringing this textual material and method together.

In order to limit the source material for the present chapter to a comprehensive set of texts, and to provide examples of less analysed instances of interspecies communication, fishing narratives depicting human–fish relations have been selected from the corpus of Estonian non-fictional nature writing. Nature writing is understood here as a form of non-fictional first-person narrative in which the author's actual encounters with the described species and environment are combined with the author's knowledge of natural history and artistic ambition (Tüür 2004; based on Buell 1995 and Murphy 1995). Comparisons are drawn with analogous texts from other cultures. Narratives about fish have been chosen in order to highlight the importance of water-related human activities in the cultural con-

struction of notions like 'nature' and 'animal', often disregarded in critical studies in favour of land-based human activities.

The aim of the present chapter is to clarify whether there are any recurrent traits in the literary depiction of the human–fish interaction and if so, what might be the causes and the consequences of these particular universalities. I proceed from the theoretical corpus of zoosemiotics, implementing Thomas A. Sebeok's (1994) ideas about interspecific communication and testing a model of cyclical communication elaborated by Timo Maran (2007: 36–47).

The chapter first gives a brief overview of the occurrence of fish in the theoretical writings in semiotics and in ecocriticism. Then the sample material – fishing narratives from the body of Estonian nature writing – is introduced and some nuances of fishing and fish biology are explained. After further theoretical remarks based on the zoosemiotic approach, a two-fold application of the theory is proposed. Different sign types that can be detected in the narratives of human–fish interaction are outlined on the basis of the sample material and the cyclical model of communication is implemented in the analysis of nature writing. The outcome of such analysis should help us to better see our limitations and possibilities as humans engaged in interspecies communication with our fellow creatures.

2. Fish in semiotics and in ecocriticism

In the framework of early semiotics, Jakob von Uexküll (1864–1944), a researcher of animal physiology and animal behaviour, has used several examples of fish *Umwelten* in his writings. *Umwelt* is a term used by Uexküll to denote the subjective spatio-temporal world of an individual, made up of the meanings that the functional connections with his/her environment have for the subject (cf. Kull 2001). In one of his most widely known works, *A Foray into the Worlds of Animals and Humans* (Uexküll 2010 [1934]), Uexküll discusses the orientation abilities (2010: 57), perception time (2010: 71), and familiar paths and territorial perception (2010: 103) of fish, pointing out that the perceptive organs as well as the effect organs differ in each species, creating thus *Umwelten* that may be incomprehensible to other species, e.g. humans, unless we discover, study, and take into account

the special sensory capacities enabling the particular manifestations of fish *Umwelten*.

In a collection *How Animals Communicate*, edited by Thomas A. Sebeok, there is a chapter on communication in fishes (Fine et al. 1977: 472–518) where the various ways of communication and behaviour of fishes (such as colouring patterns, movements, shape, size, chemical and electrical communication, acoustic abilities, signal variation) are discussed in great detail. The authors conclude,

> [...] it is obvious that fishes typically communicate for only short periods of their lives and about restricted subjects. Social behaviour is much less complex than in higher vertebrates. [...] [c]ommunication typically involves several sensory channels. (Fine et al. 1977: 509)

On a more general level of semiotic abstraction, Stephen Pain discusses inner representations and signs in animals in his contribution to *Introduction to Biosemiotics* (Pain 2008: 409–455). He argues that different qualitative and quantitative signs in a species' *Umwelt* can be studied as manifestations of 'sensory ecology' that enables us to "examine the individual relationships involved in for example the prey–predator dyad" (2008: 412). Using an earthworm as one of his model species, he demonstrates that pain and suffering as attributed to invertebrates are a matter of qualitative interpretation. A number of his ideas can be transferred into the discussion of the perception of fish, such as the distinction between signals and signs, and the argument that a qualitative dimension of semiosis appears as a result of integration of several signals from different modalities (Pain 2008: 447).

The pioneering zoosemiotician Thomas A. Sebeok discusses fish play in his 'Naming in Animals, with Reference to Playing' (1986: 84–85). In another work, he illustrates his treatment of non-verbal communication with some examples from fish (2001: 14–27). He reminds us that in the study of non-verbal communication we should not neglect the other channels besides acoustic in which non-verbal messages can be encoded, such as chemical, optical, tactile, electric, thermal, etc. Sebeok points out that communication via the chemical channel is the oldest form evolved in the course of evolution, and that it is "omnipresent in all organisms" (2001: 19). The specific com-

munication channels and abilities of fish are discussed in more detail in the course of a brief excursion into fish biology in subchapter 4.

Besides more general studies concerning fish habitats and human intervention in environmental history, there is also some research in which the human–fish relations are considered in detail. From the point of view of landscape geography, Jacob Bull is currently studying the topics of landscapes, industrial fish production, and recreational fly fishers (Bull 2011: 2267–2284). Tom Mordue has also discussed the Anglo-American practice of angling in the framework of cultural geography (Mordue 2009: 529–552).

It is complicated to conceptualise human–fish interaction because of the different elements these vertebrates inhabit and because of the different biological adaptations they have acquired in the course of evolution. The underwater perspective in literary fiction tends to be somewhat otherworldly (like, for example, in H.P. Lovecraft's stories) and it has been employed mainly in science fiction or in adventure stories, the latter being often regarded as children's or juvenile literature without much critical attention being paid to it. From among the popular and consumer texts, fish-and-stream literature that also takes into account the fish's perspective as far as its catching is concerned is mostly read by anglers – partly to reinforce their own experience, partly to obtain information about new fishing techniques.

It seems that the research into literary representations of fish has not been particularly popular among those adopting an ecocritical approach, which is the primary theoretical framework for analysing nature writing. In the preface to a major ecocritical initiative, *Nature Writing: The Tradition in English* (Finch, Elder 2002), its compilers conclude their inventory of the major topics in the Anglo-American tradition of nature writing with the comment that "fish are virtually ignored". In the seminal anthology *The Ecocriticism Reader* (1996), the only contributor to use examples of fishing fiction, in order to illustrate the postmodern understanding of 'nature' and 'naturalness', is Dana Phillips (1996: 204–222). In his comprehensive theory survey book *Ecocriticism* (2004), Greg Garrard discusses evil fish and ocean documentaries in the section entitled "Animals". One of the most outstanding recent analyses of human–fish interaction comes from Vesa Haapala in the first Finnish collection of ecocriticism, *Äänekäs kevät* [*Spring Full of Sounds*, 2008] where he focuses on the analysis

of the ethical dimension of fishing, as expressed in the collection of angling essays, *Lohilastuja ja kalakaskuja* [*Salmon Stories and Fishing Anecdotes*; first published in 1921], by a Finnish national writer Juhani Aho. In this regard, the present chapter attempts to proceed in the same direction as Adam Dodd and Ralph Acampora in their contributions to the current volume, namely, to actualise the cultural relevance of the "lesser creatures" often ignored in our regular daily perception.

3. Fish in nature writing

As Graham Huggan has put it in the introduction to his co-authored book *Post-Colonial Ecocriticism*, it is the "charismatic megafauna" that receive most of the literary and critical attention when animal images are discussed (Huggan, Tiffin 2010: 60). In the stories set in aquatic settings, large sea mammals such as whales, dolphins, or even seals have been preferred as subjects by many writers. In the Estonian context, regular local fish, such as pike (*Esox lucius*), burbot (*Lota lota*), or trout (*Salmo trutta*), may also serve as large and impressive creatures in folk narratives (Hiiemäe 1999a: 22; Hiiemäe 1999b: 26) as well as in nature writing. The central Estonian authors whose fishing narratives will be discussed in the following are writers and cultural critics from the first half of the twentieth century: Jaan Vahtra (23.05.1882 Võrumaa – 27.01.1947 Võru) and Karl Eerme (09.07 1905 Tartu – 09.09.1975 Six Mile Lake, Toronto). Vahtra was an Estonian artist, illustrator, and memoir writer, and a devoted angler at his native lakes of Võrumaa district of Southern Estonia. Karl Eerme was a journalist who befriended Vahtra, became an angler, and has fished in and written about the same regions as Vahtra. They occasionally figure in each other's fishing narratives; both men's fishing tales have been illustrated by thematic drawings and woodcuts by Vahtra. So these two writers and their texts form a complementary pair and enable comparison of the ideas in each other's writings. As predominantly recreational, and not subsistence fishers, their stories indeed bear occasional marks of humoristic exaggeration, raising thus also the credibility question, but it has been assumed here that the technical details of the human–fish encounter have been rendered in a veracious manner.

The main sample material for testing the analytic tools proposed in this chapter consists of two texts by these authors. The story 'Angling' (first published in 1946) by Jaan Vahtra has been chosen because of its didactic qualities – it describes the first few times when the first person narrator goes fishing with his uncle, who teaches him the basics of angling and connects his teaching to the particular location and environment. The second text, 'The Last of the Mohicans' from the collection *Õngelatiga mööda Võrumaad. Kalakirjad ja miniatüürid* [*Around Võrumaa County with a Fishing Rod. Fishing Stories and Miniatures*] by Karl Eerme (1935), takes some steps further from the technicalities of angling and makes a strong moral statement as to the proper ways of relating to fish.

As Estonian nature writing has not been widely translated and is thus relatively inaccessible source material for international readers, Ernest Hemingway's *The old man and the sea* (1962 [1952]) or Ted Hughes's poem 'Pike' (1985 [1960]) can be considered as parallel examples from world literature on fish. Although these texts are fiction and poetry respectively, and not nature writing in the strict sense, they are useful as material for comparison in the search for the universal traits in the semiotics of human–fish interaction. Comparisons are also made with the Finnish tradition of nature writing – one source being the above mentioned collection of angling essays, *Lohilastuja ja kalakaskuja* by Juhani Aho, combined with the excellent commentary on the text by Vesa Haapala (2008: 95–135). Haapala especially focuses on the author's rhetoric that justifies the relationship between the fisherman and his catch. He points out that Aho regards fishing as a ritualised practice that enables human "dialogue" with fish where fish is endowed with subjectivity. There are even some instances of decadent imagery with erotic undertones in Aho's fishing tales (for example, in 'Salaperäiset säyneet' ['Mysterious Ides'], he likens the representatives of the species to young, sturdy, but graciously moving peasant girls freshly bathed in the sauna who surrender to a fisher as if to a lover [Aho 2011: 104; Haapala 2008: 111]).

One more good source of fish-related texts is the work of another major Finnish writer, Veikko Huovinen, whose *Pylkkäs-Konsta mehtäämässä ja muita erätarinoita* [*Konsta Pylkkänen Goes Hunting and Other Wilderness Stories*] (2011) has also been analysed in part

by Toni Lahtinen in the *Äänekäs kevät* collection. Huovinen, too, writing on the basis of his own fishing experience, raises ethical questions about nature and water protection, about the nature of the fisher–fish relationship, about the know-how of fishing. But he also manifests the spiritual side of fishing,

> Winter fishing is a matter of belief. [...] It is a matter of belief in the same manner as practically any work, initiative, or endeavour. Once the drifting snow has been swept aside and the ice-chipper has been toiled with, one already starts to expect all sorts of things... One starts to hope that from that dark abyss some aquatic creature would reply to the aspirations of the man on the surface. Oh yes, an answer may come from thence that not all is in vain, after all, a reply in the manner of a nice tug on the hand that holds the line. (Huovinen 2011:157)[1]

Here, as in Aho's texts, the ritual nature of fishing is stressed; the fish deep in the lake are regarded as superhuman creatures who send messages to the mundane dwellers, conveyed by bodily sensations. Fish and fishing are conceptualised in terms of symbolic communication that may easily turn out to be a poetic exaggeration. In order to determine the actual extent of such fallacy, the possible overlapping in human and fish *Umwelten* should be examined, including thereby literature on fish biology as well.

4. Fishing and fish biology

In relation to our source material, several differentiations have to be made, as 'fishing' is not a homogenous activity, but the particular nature of each fishing occasion depends on a number of environmental, economic, and cultural factors. In order to contextualise the Estonian nature writing on fish, it must be specified that the geographical setting of Estonia on the edge of the Baltic Sea determines the major part of our fishing activities and their cultural representtations as marine (cf. Unt 2005: 129–150). Generally, subsistence fishing takes place predominantly in marine areas, whereas leisure fishing and, thence, also most of the fishing narratives falling into the category of nature writing, concentrate on our freshwater bodies. There are 1755 rivers (EE 11: 133), and ca. 1200 lakes with a total

[1] Translated from Finnish by the author of the present chapter.

area of 2130 square kilometres (EE 11: 138) in Estonia. Both Vahtra's and Eerme's stories are set at freshwater sites in Southern Estonia.

Due to historical conditions that determined Baltic-German landlords as the owners of the inland waters and, consequently, fish, and that banned the local Estonian peasants' free access to these resources, we can speak about the emergence of leisure fishing among native Estonians only after the WWI when Estonia gained its independence (cf. Talve 2004; Kasekamp 2010). Pragmatic associations with fish and fishing also prevail in the samples of Estonian nature writing. For example, the first Estonian language field guide to fish includes culinary suggestions alongside identification cues for each species (Spuhl-Rotalia 1896).

On the basis of the *Yearbook of Estonian Fishing Industries* (Armulik, Sirp 2011), lists of the most frequently caught fish species in Estonian waters can be drawn up. The dominant species among freshwater catches from our major lakes and rivers are in principle similar, be it from industrial or leisure fishing: pikeperch (*Sander lucioperca*), perch (*Perca fluviatilis*), pike (*Esox lucius*) and bream (*Abramis brama*); we may add roach (*Rutilus rutilus*), which tops the leisure fisherman's list. These lists reflect the contemporary state of our fishing stocks; it must be taken into account that the historical situation may have been somewhat more varied. In our central authors' texts, Jaan Vahtra (1982) depicts perch and brown trout (*Salmo trutta* morpha *fario*) as his central objects of catch alongside with roach and bream, but his major angling story describes a series of attempts to catch a huge pike from a lake near his childhood home. The other "usual" fish play a rather limited role in that story. Karl Eerme in his *Angling letters* (1935) discusses to a great degree the same fish species as Jaan Vahtra: roach, pike, perch, and brown trout.

Another distinction that seems worth pointing out in the context of fishing techniques is that between coarse and fly-fishing. This is specifically a freshwater issue associated with bodies of running water. The topic has been elaborated in a recent study of angling in relation to the tourism industry (Mordue 2009: 529–552). Mordue demonstrates how fly-fishing is historically constructed as a high-class social pastime, whereas bait fishing is regarded as a vulgar practice of the masses, recently even further discredited by extensive use of technology, whereas fly-fishing relies on the *connaissance* and experience of

the fisher. In the latter, also the notion of 'fair play', implying the contest of equals, is of great importance (Mordue 2009: 540). In an informed manner, Juhani Aho negotiates between these two modes of fishing in his essays, but his preferences appear to be with fly-fishing. The Estonian authors generally do not reflect upon such niceties, but report regular bait fishing techniques and instances of fly fishing. Vahtra is known to be one of the first recreational fishermen to introduce fly-fishing in Estonia (E.J.V. 1939: 4–11).

According to Estonian ichthyology handbooks (Pihu 2006; Ojaveer et al. 2003), all the species described by Eerme and Vahtra live mainly in fresh water; pike and roach prefer more abundant in-water vegetation than brown trout and perch. Regardless of inhabiting similar ecological conditions, the individual senses that enable fish to be aware of their environment and make contact with other species, including humans, may vary greatly between the species. As pointed out in reference books, fish are so diverse a group of animals that the presence of gills and fins is the only common feature shared by all its members. As in most vertebrates, vision is the dominant sense in the case of fish,[2] but they also make use of their mechano-, electro-, and chemosensory systems to gain information about the environment or to communicate with each other and to keep the shoal together (Jobling 1995: 11).

The fish feeding in open waters tend to take advantage of the sense of sight much more often than the fish that search for food from the muddy bottom. Such bentic feeders, like roach, and bream, resort to olfactory stimuli and the sense of smell, as well as to other chemical cues and the sense of their lateral line organs. Salmon use their outstanding olfactory memory for homing over vast distances. A fine sense of smell also helps to avoid danger if a predatory fish or its wounded victim is smelled (Pihu 2006: 179). Whereas the smelling organs of fish are located at the front of their heads, their chemoreceptors are dispersed all over the body (Jobling 1995: 34–35). Electroreception helps fish to locate prey; fish may even prefer respective signals in the form of a weak electric field to visual and

[2] Studies have proven that fish are able to distinguish colours and that they seem to prefer the colours that match their own body hue. This nuance is used in the design of fishing equipment that must have visual appeal to the prospective catch (Pihu 2006: 177).

chemical stimuli (Jobling 1995: 32). In addition, fish have habitat-specific sense of pressure; they are sensitive to very slight alterations in water temperature and to the alterations in the magnetic field of the Earth. Fish are able to sense minute changes in the air pressure influencing their activity in advance of the humans or of the measuring instruments constructed by humans (Pihu 2006: 182).

The tactile sense is an object of debate among those concerned with the sensitive abilities of fish: are fish able to feel pain? As there are numerous records of fish caught with severe mechanical injuries, it has been argued that they are able to endure severe wounds without dramatic consequences. Fish are able to continue to grow throughout their life, so a pike that has its tail "amputated" by another predator may still continue to grow in a normal tempo. In Finno-Ugric folklore the "invalid" fish have been noted and granted with a special status. Especially the so-called blunt-tail pikes have been attributed supernatural qualities or have been depicted as the special favourites among the underwater people's cattle (i.e., fish shoals) that should not be removed from the water body (Hiiemäe 1999a: 23–25; Hiiemäe 1999c: 19). In 'The Last of the Mohicans', the author states, recalling an unsuccessful catching attempt, that the hook is most probably grown into the flesh of the fish by the time of narrating (Eerme 1935: 50), without any further reflection about the pain the hook may have caused the fish. In contrast, an Estonian elementary school natural history reader from 1934 clearly advocates minimising the suffering of fish by killing them immediately after the catch (Kirss et al. 1934: 53–54). Hemingway's Old Man ponders upon the question whether the fish feels pain, but these thoughts are initiated by his own bodily suffering at the other end of the same line.

It is a common misperception that fish are not able to make or receive any sound. They are able to produce a diverse array of sounds, usually inaccessible to humans, as the sound waves lose more than 99 per cent of their energy in the course of transition from water to air (Pihu 2006: 182). Fish sense the waves conveyed by water with the help of their lateral line organs. Most of the cells that receive and transmit the waves are located underneath the scales along the sides of the fish that appear as a visible line on its body surface, but a number of such cells are located on the head of the fish. Via the acoustic sensory system, fish are able to extract a great amount of information

about their environment (Jobling 1995: 21–23). Noise may even impair the hearing abilities and the fine tissues of fish (Helfman et al. 2009: 81). Bream are known to be especially vulnerable to noise. In Sweden, it has even been prohibited to ring church bells during the bream spawning season (Spuhl-Rotalia 1896: 91).

In conclusion of this brief excursion into the biological foundations of fish *Umwelt* it can be stated that fish possess several species-specific senses and abilities that are inaccessible for human perception and, quite often, also to human imagination, whereas seeing, hearing and tactile sense still provide a common ground for human–fish interaction. However, Timo Maran reminds us that

> In the case of species whose communication systems are not similar and mutually intelligible due to kinship or convergence, inter-species communication resembles more of the way how living beings obtain information about the phenomena of the inanimate world. (Maran 2008: 86)[3]

There is indeed evidence that humans have generally regarded fish as a part of the inanimate environment, as a resource rather than a group of individuals. The dramatic aspect is introduced in nature writing namely by depicting fish as individual(s). But what are the consequences of such a shift in perception? In the following, a more specifically semiotic analysis of the textual representations of human–fish interaction is presented.

5. Signification and communication. Some theoretical remarks

One of the founding fathers of semiotics, Charles Morris, declares in the opening paragraph of his *Foundations of the Theory of Signs*,

> Men are the dominant sign-using animals. Animals other than man do, of course, respond to certain things as signs of something else, but such signs do not attain the complexity and elaboration which is found in human speech, writing, art, testing devices, medical diagnosis, and signaling instruments. (Morris 1972: 17)

In this passage, Morris evidently refers to mediated signs – be they mediated via technical equipment or by means of symbolic

[3] Translated from Estonian by the author of the present chapter.

communication, the usage of which are generally characteristic of human species. However, the fact that other animals, such as fish, are not capable of relating to the signs conveyed by, for example, scientific equipment, does not imply that their intra- or interspecies communication mechanisms should be left unstudied. On the contrary, it is important to do this for the sake of obtaining a better understanding of human sign-use practices as well as those in action in the interspecific communication. Being familiar with the less mediated ways of communication helps us understand the complexities that are brought along to unmediated communication by adding an aspect of arbitrariness to it.

Thomas A. Sebeok states quite simply that animals communicate through different channels or combinations of media. He writes: "Any form of energy propagation can, in fact, be exploited for purposes of message transmission" (Sebeok 2001: 15). The interpretations in different species of the same stream of propagated energy may vary, but a common channel enabling perception can generally be found even between rather distant species.

As the *Umwelten* of all species are constructed and maintained differently, using different perception organs and channels, and driven by different needs, it is not possible to assume that the signals emitted by an individual should be meaningful to any other individual. Therefore, it is necessary to make a distinction between communication and signification (Martinelli 2007: 28). The former describes a situation where there is an intentional sender involved, and both sender and receiver share a considerable amount of the principles determining the form, the rules of codification, and the context of the messages. This sort of interaction is usual in intraspecific communication, such as human language. In the case of signification, the semiosis resembles the way inanimate environment is interpreted by a living creature (Maran 2007: 42; Nöth 2001: 72). In nature writing, instances of communication as well as of signification can be found in the descriptions of human encounters with other animals.

New knowledge can be obtained only as mediated by signs, as a prominent contemporary American semiotician Floyd Merrell argues on the basis of Peirce's semiotic thought. A sign, according to Merrell's view, is an 'interrelated interdependency' of its three constituents, namely representamen, semiotic object, and interpretant.

The formation of each sign starts with the perception of representamen that is associated with a corresponding semiotic object, the combination bringing forth the interpretant that in turn becomes a new representamen along the process of semiosis. He points out that among the basic three types of signs (icon, index, symbol) proposed by Peirce, a certain agreement is required in order to bring forth a sign process with predominantly symbolic qualities. In case of interspecific communication involving humans, such agreements tend to be one-sided, not mutual. For example, it is highly dubious that a hooked fish would perceive its struggle as 'a battle of equals'. Merrell concludes his treatment of the sign processes by a remark that "human communities unfortunately place undue priority on the symbolic mode" (Merrell 2001: 34). This statement provides an ideological starting point for critical assessment of fishing accounts as a subcategory of nature writing.

6. Signification. Different sign types in human–fish interaction

In the following, the fishing accounts in nature writing are described on the basis of the categorisation of signs as outlined by Thomas A. Sebeok in his book *Signs: An Introduction to Semiotics* (1994). The aspects of signs proposed in his book are based on the threefold typology of signs outlined by Charles Sanders Peirce, namely icon, index, and symbol. Sebeok's typology aims at providing a system that would be applicable to a wider area of research than merely human communication; in his own designation, zoosemiotics (Sebeok 1994: 20). Sebeok lists the six "species" of signs to be discussed further in the text: signal, symptom, icon, index, symbol, and name. He reminds us that all signs are relational and that they contain the different sign aspects simultaneously. Each of its aspects may dominate others in any of the particular cases of signifying – "aspects of a sign necessarily co-occur in an environment-sensitive hierarchy" (Sebeok 1994: 21).

As Sebeok (1994: 18) points out, in addition to the actual signs themselves, there is the situation of **zero sign**, when the very absence of a sign is significant – a very frustrating option for a fisherman indeed. Let us recall that *The Old Man and the Sea* starts out with the following sentence: "He was an old man who fished alone in a skiff in

the Gulf Stream and he had gone eighty-four days now without taking a fish" (Hemingway 1962: 7). Zero sign, the very absence of fish, becomes very significant in such context. Eerme's protagonist in 'The Last of the Mohicans' takes precautionary measures: he approaches local men logging on the shore, asking: "You ain't got any fish in that river, have you?" (Eerme 1935: 51). And, indeed, he gets a handful of stories containing good tips in return which guarantee the zero sign situation will not be encountered.

Among the sign types that indicate the presence of fish, the most common one is the **signal**. In the case of signals it is not necessary that the messages sent and interpreted by the participants in the communication should use the same sign system or the same communication channels. According to Sebeok (1994: 22), if a signal is received by the sense organs of another individual, it interweaves the communication cycles of the sender and the receiver regardless of whether the signal was *meant* to be sent or received by the particular individuals engaged in the process. It is the "energy propagation" that is able to transmit any messages.

Given such definition, the tug felt by the fisher's nervous system and conveyed by his/her hand muscles when a fish bites on the hook counts as a signal. Its sending is not intentional on behalf of the fish. There might even not be a fish or a 'sender' at all, but for example an underwater tree stump that has caught the hook in the flow, giving a false signal to an inexperienced fisher. But for the human participant in the situation, it is a signal anyway, received primarily on the motoric level. Eerme describes a dramatic receiving of a signal:

> I had already grown careless and put my hand into my pocket, letting my hook with a bite flow towards the nock in the bank, when all of the sudden I felt an abrupt pull of the line so that I did not even understand what was going on. In the next moment I had lost my balance and fallen into the river from the birch trunk. (Eerme 1935: 53)

This is a fully bodily reception of a signal, plus a confession that its content was not understood at once.

A sign is considered **iconic** when there is a topological similarity between a signifier and its denotata (Sebeok 1994: 28). The lure is an iconic representation of a small fish, and the bite in fly-fishing is an icon of an invertebrate (*Stenofylax stellatus* in Juhani Aho's case; Aho

2011: 178); but not necessarily always referring to any particular species at all, just resembling a generalised human perception of an "insect" (cf. Larissa Budde's chapter in the present volume). Whether size, shape, or movement is the quality by which the iconic similarity is recognised in fish may vary, but in practice, there must be an overlap of the human and fish *Umwelten* in recognising visual iconicity.

Indexicality is proximity, be it visual, auditory, olfactory or other. The simplest instance of an indexical sign related with fish would be the concentric water circles on the surface as the fish jumps out of the water, or the splashing noise it makes while doing so. As Jaan Vahtra demonstrates, even environmental features may act as index of the presence of certain fish: deep muddy lake floor would indicate the presence of pike; shallow stone and gravel bottom stands for the proximity of perch, and in-water plants growing on the gravel bottom near the shore of the lake – for bream and roach (Vahtra 1982: 92–93). In the marine environment, various fish-eating birds often act as indices of fish shoals. Indexicality probably works the other way, too, i.e. the bite cast into the water may be taken as an index of the presence of strangeness or danger (fishing rod and a human agent), as fish can perceive even a slight alteration in the chemical-molecular composition of the water as an index of an intervention from outside of their own realm.

The notion of **symptom** should be used, understood as an instance of index, a non-arbitrary sign that does not require an intentional sender (Sebeok 1994: 49). For example, a fish jumping out of the water is a symptom of its fit condition.

Sebeok also devotes some passages to **fetish sign** that overlaps, according his definition, with several sign categories: these are predominantly indexical signs that signify metonymically (i.e., on *pars pro toto* principle) and that are intermingled with both iconic and symbolic elements (Sebeok 1994: 101). For example, lures may constitute a fetish sign for an enthusiastic fisherman who might have a whole collection of them. In Juhani Aho's fishing miniatures the fetish-like tones may be detected, as epithets such as 'delicious', 'fabulous', 'tender', 'work of art' are used when he discusses artificial flies.

In human artistic interpretations both indexical and iconic representations tend to acquire a strong symbolic character that overrides the previously discussed aspects of signs that Sebeok terms "natural", as opposed to "symbol, which is in the conventional mode, or reflective of a relation that is characterized by an imputed quality" (Sebeok 1994: 81–82).

Name is a sign type that is often regarded as a human phenomenon only, although Sebeok (1986: 82–96) has demonstrated that naming as individual-specific identification occurs in very varied animal groups and may take advantage of olfactory, auditory, or other channels. Sebeok points out that especially animals in captivity tend to be given proper names according to the human rules. Eerme's sample story is titled 'The Last of the Mohicans', which refers to the name of a large ancient trout living in Pärlijõgi (Pearl River), named after a legendary Native American tribe. Such "cultural labelling" creates a possibility for easy memorisation and a certain intimacy between humans and other animals named. On the one hand, such an approach helps to bring our fellow creatures closer to common readers, helps to induce empathy. On the other hand, it colonises, as it were, the *Umwelt* of the non-human species and superimposes the logic of human agency on them.

From naming there is just one step to **symbols**, a type of sign associated exclusively with the human capacity of imagination and abstraction. Fish may act as a symbol in the folkloristic context. In Vahtra's story the great old pike that is finally caught from the lake (the fight includes dragging of the boat by the fish, just as in *The Old Man and the Sea*) acts several times as if it sought support from the deep waters of the lake (Vahtra 1982: 105). A connection can be made with Estonian folklore, where the underwater spirits may be reluctant to release their favourite cattle, or even hinder the fisher's way back to the shore (Hiiemäe 1999a: 24). In Vahtra's story, the older fisherman burns a hole in his shirt and drops his pipe into the water during the first fight with the fish. This can be interpreted as an indication that the lake spirits will not yield up the fish without amends.

The large old trout in 'The Last of the Mohicans' who is reported to have escaped from all nets and rods, including that of the narrator, is personalised and brought closer to the reader; her actions are rendered with respect (Eerme 1935: 47–54). The fish is described as

an equal antagonist to the human's agency. The end of the story engages the fish in a powerful set of symbolic relations. The readers learn together with the shocked narrator that the fish had been *shot* by "men who do not know what they have guns for" (Eerme 1935: 54). A gun does not represent any sign for fish, being simply outside the reach of its *Umwelt*. It can by no means be interpreted as a form of communication. The text suggests clearly that such behaviour from humans is to be interpreted as an assassination of an innocent hero with a name and personality. The utter wrongness is expressed via archetypes: fire and water. Thus, the simple exchange of (deceptive) signals is developed into an epic story about the struggle between elements; not only between two species inhabiting air and water environments respectively, but even between the elements themselves, water and fire. On one hand, stressing the symbolic dimension of human–fish interaction helps us to develop sympathy towards the fish and other underwater creatures, but on the other hand, it might elevate the symbolic aspects of such communication at the expense of the iconic and indexical ones that are more likely to be shared on the purely biological premises of each communication partner involved. Being informed about and able to distinguish between three basic qualitatively different aspects of sign (iconicity, indexicality, and symbolicity) helps us to get a better analytical grip of the source material for further ecocritical assessment.

7. The semiotic mechanisms of human–fish communication

In his writings on zoosemiotics, Thomas A. Sebeok (1990: 111–112) has proposed a linear model together with a six-fold complex of research questions for studying animal communication. Developing Sebeok's six research questions further, Timo Maran (2007: 44–45) has outlined a research program for studying interspecies communication from its pragmatic (related to the particular situation of communication), syntactic (communication codes and messages) and semantic (meaning of signs and context of communication) aspects on the basis of a cyclical model that integrates Uexküll's functional circle, Morris's division of semiosis into syntactis, semantics, and pragmatics, and Sebeok's program for studying animal communication.

We will continue our analysis with Jaan Vahtra's story 'Angling' (1982: 91–107), focusing on the details of the human–fish interaction as described in the story, following the lines drawn by Timo Maran.[4] The first three questions address the pragmatic dimension of the communication, concerning signs as related to their users.

1. What are the communication organs of each species like, and what are the options for sending and receiving signals from the respective other species provided by them?

Since humans and fish inhabit different elements, their sensory organs are somewhat different. Seeing through the water surface is not an easy task, but a fish is capable of spotting shadows right above it. Humans may also spot shadows and water movements indicative of the presence of fish, but it depends greatly on the weather and on the reflections of the surface. The fish central in Vahtra's story is an ancient huge pike. According to ichthyology reference books, pikes predominantly rely on vision and the lateral line organ in their search for food (Pihu 2006: 164; Jobling 1995: 24). Of these two senses, vision is common to both human and pike, and that is also the primary way of making mutual contact, in addition to the tactile signals that follow the moment of hooking. Vahtra describes the encounter as follows,

> "Ay, brother," my uncle shouted and started to prepare the lift-net. "I can already see you – it is not a fish, it is a crocodile!" I stood, excited, besides him, and bored my eyes into the water. Yes, now I saw it, too: there was a huge fish hooked on the line in the water, it moved itself slowly and its big, terrible eyes frightened me. (Vahtra 1982: 97)

In the poem 'Pike', Ted Hughes (1985: 59–60) elaborates on the eye and the watching abilities of a pike so that it finally cumulates into an all-embracing metaphor of something primordial watching over the narrator, even over all the humans ever engaged in reading the poem. The fact that seeing is a sense common to both humans and fish brings about the possibility of mutual gaze – a somewhat uncanny idea that Derrida has addressed in his essay 'The Animal That Therefore I am (More to Follow)' (Derrida 2002: 369–418). Juhani Aho in his *Salmon*

[4] The points to consider have been rephrased from the Estonian original by the author of the present chapter.

Stories also devotes ample space to a study of fish vision, including several drawings illustrating the fish's scope of vision in regard to the human fisher on the shore (Aho 2011: 277–293).

Whether the pike in each case intends to frighten its catchers remains highly dubitable, but its predatory appearance that has developed over the course of evolution evidently still manages to evoke uneasiness in modern human on-lookers. The exchange of signals based on vision proves to be possible.

2. Is communication one- or two-way; on which levels does the feedback occur, do both species use the same channels and the same time frame to forward their signals?

In the case of angling, the signals as well as feedback on either end of the line occur simultaneously as soon as the fish has taken the bait and starts jerking on the line. The signals may seem rather mechanical, but for example Eerme (1935: 12) claims that an experienced fisherman can tell the species by its manner of movement even without seeing it. In a way, both fish and humans use the same channel in this situation, namely the tactile one. The fact that pain may be involved on either end of the line can be regarded as an extension of the tactile. In the case of humans, attending to and responding to the tactile feedback helps to adjust to the situation and move accordingly, in order to catch the fish successfully. Fish, in turn, try to minimise the tactile feedback, i.e. escape from the situation. Tactile signals are characterised by virtually instant delivery and exact location of origin, but by a very small area of dispersion. Such signals do not require much energy input to be brought about, and they are quite reliable (Maran 2008: 78). These parameters apply to both human and fish engaged in tactile contact, making it possible to share the experience to a great degree. *The Old Man and the Sea* provides a good example of such an insight. The experience of hooking is definitely shared by both engaged parties, as well as following the physical struggle.

3. In which respective positions are the *Umwelten* of the humans and the fish, and how are the received signals positioned in them? What is the correspondence between the information sent and the message received? What amount of the information becomes interpreted; how much background information is available to each participant that is not directly encoded in the immediate interaction?

Humans often apply background knowledge in their encounters with fish. For example, the uncle in 'Angling' explains which type of lake/stream floor pikes prefer to inhabit (Vahtra 1982: 96). Knowledge about the prospective culinary qualities of their communication partners characterises humans, but most probably not vice versa. Most caught fish do not have any background information about the anglers, as usually the hooking experience is unique and lethal for them and the memory capacities vary with species. Tests have shown that if a pike manages to get off the hook, it will not grasp a similar lure for several subsequent days. Perch forget about their dramatic experience in minutes, whereas carp can be cautious after a catch-and-release shock for almost a year (Pihu 2006: 241). There are accounts of old and experienced fish that evade all means of capturing; Eerme's story 'The Last of the Mohicans' about a brown trout being one such. In the case of fish, however, it is true that in most encounters with humans, no feedback and subsequent learning really occurs. In Timo Maran's words,

> In many instances of inter-species communication, especially in the case of antagonistic ecological relations (such as predation), the behavioural reaction of the receiver may prove to be lethal for the sender, and as a result, the sender as an individual is deprived of the chance to learn from the cumulative communicational feedback. (Maran 2008: 86)

In the case of humans, there is a peculiar tendency to over-interpret the information provided in the course of the encounter. The behaviour of a captured fish on the line is often interpreted in human terms, such as teasing, fighting, malevolence, etc. – although emotionally, it could be regarded as deception on the part of the humans from the fish's point of view as well. The actual catching of fish is routinely depicted as an eye-to-eye combat; the fish is imagined as an equal agent. It is as if it "knows" where to go in order to cause the greatest possible harm for its human catcher: it heads toward the open sea in *The Old Man and the Sea,* and underneath the boat in Vahtra's tale (1982: 97). The fish's struggle for life and death is casually described from the human viewpoint as a simple instance of exciting communication – at least as long as the human's life is not threatened.

The syntactic dimension is addressed in two points on the agenda. Morris (1972: 29) regards syntactics as the elementary realm of semiosis, as the meaning of signs only evolves in combination with other signs; there is no such thing as a meaning of a single individual sign abstracted from its semiotic context. Syntactics in Morris's sense is concerned with the mutual relations of signs.

4. What is the repertoire of the messages sent to each other by of each communication partner? Are the signals forwarded in an active or in a passive manner (i.e., are they signals or cues); what kind of feedback do they enable?

In the case of angling, the signals are definitely active, and feedback is essential. It would be best for fish to avoid or escape such contact, i.e be passive, but once engaged, active response is required. The sequence of the signals is rather uniform in each instance of capture, but the outcome is determined to result in a failure, be it a failure to survive, or a failure to kill (if the fish escapes). It is a special type of semiosis that is clearly oriented to coming to an end, i.e. to death – unlike most of the communication we as humans are routinely engaged in. It is also peculiar to note that as a rule, such line of reasoning is not common in the angling stories. Fish are not regarded as individuals, but rather as a group, the interaction with which will not cease until the shoals are extinct. Feedback in each particular instance of contact helps one involved party to improve their capturing techniques, and the other party to learn better to avoid the contact in the future. As research has shown, many fish species are capable of learning, although at a slower rate than terrestrial vertebrates (Pihu 2006: 238–239). Imitating behaviour is an important capability of fish that may help them to avoid the same trap, but that may for example also result in an incessant catch of perch for an angler (Eerme 1935: 13).

5. Which codes are in use for making the connection and in interpretation?

In addition to some overlapping in the respective *Umwelten* and a certain amount of shared signs for both parties involved in inter-species communication, there has to be some mutual understanding about the coding of the messages and about how these are related to the emergent meaning in order for a meaningful act of communication to take place. Codes may manifest themselves in relation to a par-

ticular context or an object, thus they are not statically fixed or given. A common knowledge base of previous analogous communication acts helps to establish the necessary codes for communication. In the case of fishing, human cultural codes are superimposed on the communication, enabling the interpretation of the events as acceptable to human culture. It is debatable whether some more experienced fish would be able to detect the (human) code behind the message in the form of a hooked earthworm. It is more likely that merely human codes are applied in angling as a form of communication, thus technically excluding the idea of fish as a communication partner.

Besides pragmatics and syntactics, a consideration of the semantic dimension is to be included, concerned with the relations of the signs to their objects.

6. What is the meaning of the delivered messages for the sender and for the receiver; what functions do the received signals have? What type of ecological relation is manifest in the communication?

As it has been already demonstrated, the meanings of the signals are rather different for each of the parties engaged in angling as inter-species communication. For fish, the signals are predominantly tactile and hostile, whereas humans may interpret them as exciting and arousing. There is not much freedom of interpretation involved if we consider the position of a hooked fish. Using a zoological term, it is a predator–prey relationship, interpreted as a noble combat of equals in the human mirror. For fish, no meta-level of communication exists, whereas for humans a symbolic layer of a magic action, duel, revenge, victory, etc. is easily built on top of the simplest mechanical exchange of signals. The stories used in our analysis provide convincing proof to this claim. Catching a fish is textually turned into a spiritual experience, an initiation rite, a symbolic marking of a certain period in a human's life – as a rule, any textually described situation is over-loaded with human symbolic meanings. It is paradoxical that evading the possible fish perspective is actually what makes the fishing accounts interesting and exciting reading material for humans.

8. Conclusion

Although human contact with fish as a biological class is not as frequent in our daily culture as with many terrestrial vertebrates or even invertebrates, human–fish interaction has been of major importance in terms of human survival (nutrition) from the dawn of *Homo sapiens*. It must be admitted, though, that the cultural significance of fish has not enjoyed much scholarly attention until quite recently. Having chosen nature writing as the point of departure for the present chapter, it has proven difficult to find substantial analyses of textual fish representations from the earlier tradition of ecocritical research. In order to handle the sample fishing narratives from the tradition of Estonian nature writing in a way that would also enable fruitful comparison with similar texts from the literary heritage of other national literatures, the analysis has been grounded in semiotic theory and two models proposed in the framework of zoosemiotics have been implemented in textual analysis.

The present analysis can be summarised in a recognition that, regarded from the semiotic perspective, the depiction of fish and human–fish interaction in nature writing is a strikingly multi-layered phenomenon, including components such as signification, communication, iconic and indexical relations, as well as symbolic relations, different sign types, etc. Research and analysis help to reveal the dynamics of these and other aspects of inter-species' semiosis. It is possible to say that attributing human symbolic meanings to different instances of the human–fish interaction tends to be a universal feature of such texts. It is instructive to attempt to reconstruct the possible "fish perspective" with the help of ichthyological knowledge. A certain overlap in the *Umwelten* of humans and fish (such as the importance of the sense of vision, for example) definitely exists, but we often tend to override the common ground with our own meanings and values. However, we have to bear in mind that human representations have consequences for real animals. At the same time, it must be remembered that we inevitably work within our human constraints, and the results of our studies are conditioned by this semiotic fact.

Bibliography

Aho, Juhani. 2011. *Lohilastuja ja kalakaskuja* [Salmon stories and fishing anecdotes]. Helsinki: Avain.

Armulik, Toomas and Silver Sirp. 2011. *Eesti kalamajandus 2010* [Yearbook of Estonian fishing industries 2010]. Pärnu: Kalamajanduse Teabekeskus.

Buell, Lawrence. 1995. *The Environmental Imagination. Thoreau, Nature Writing, and the Formation of American Culture*. Cambridge, MA and London: The Belknap Press of Harvard University Press.

Bull, Jacob. 2011. 'Encountering Fish, Flows, and Waterscapes through Angling' in *Environment and Planning A*, 43: 2267–2284.

Derrida, Jacques. 2002. 'The Animal That Therefore I am (More to Follow)' in *Critical Inquiry*, 28(2): 369–418.

EE 11 = Raukas, Anto (ed.) 2002. *Eesti Entsüklopeedia. Eesti – üld* [Estonian encyclopaedia. Estonia: general facts]. Tallinn: Eesti Entsüklopeediakirjastus.

Eerme, Karl. 1935. *Õngelatiga mööda Võrumaad. Kalakirjad ja miniatüürid* [Around Võrumaa county with a fishing rod. Fishing stories and miniatures]. Võru.

Finch, Robert and John Elder. 2002. 'Introduction to the 1990 Norton Book of Nature Writing' in Finch, Robert and John Elder (eds) *Nature Writing: The Tradition in English*. New York: W. W. Norton & Company: 21–31.

Fine, Michael L., Howard E. Winn and Bori L. Olla. 1977. 'Communication in Fishes' in Sebeok, Thomas A. (ed.) *How Animals Communicate*. Bloomington: Indiana University Press: 472–518.

Garrard, Greg. 2004. *Ecocriticism*. London and New York: Routledge.

Haapala, Vesa. 2008. 'Aika Huopanalla. Kalastuksen estetiikasta ja etiikasta Juhani Ahon *Lohilastuissa ja kalakaskuissa*' [Time at Huopana. Aesthetics and ethics of fishing in Juhani Aho's *Salmon stories and fishing anecdotes*] in Lahtinen, Toni and Markku Lehtimäki (eds), *Äänekäs kevät. Ekokriittinen kirjallisuudentutkimus* [Spring full of sounds. Ecocritical literary research]: 95–135.

Helfman, Gene S., Bruce B. Collette, Douglas E. Facey and Brian W. Bowen. 2009. *The Diversity of Fishes: Biology, Evolution, and Ecology*. Chichester: Wiley-Blackwell.

Hemingway, Ernest. 1962. *The Old Man and the Sea*. London: The Reprint Society.

Hiiemäe, Mall. 1999a. 'Kakskümmend kaks kala eesti rahvausundis' [Twenty-two fishes in Estonian folk belief] I in *Mäetagused*, 11: 7–33.

—. 1999b. 'Kakskümmend kaks kala eesti rahvausundis' [Twenty-two fishes in Estonian folk belief] II in *Mäetagused*, 12: 7–29.

—. 1999c. 'Kakskümmend kaks kala eesti rahvausundis' [Twenty-two fishes in Estonian folk belief] III in *Mäetagused*, 13: 7–23.

Huggan, Graham and Helen Tiffin. 2010. *Postcolonial Ecocriticism: Literature, Animals, Environment*. London and New York: Routledge.

Hughes, Ted. 1985. *Selected Poems 1957–1982*. London: Faber and Faber.

Huovinen, Veikko. 2011 [1975]. *Pylkkäs-Konsta mehtäämässä ja muita erätarinoita* [Konsta Pylkkänen goes hunting and other wilderness stories]. Helsinki: Otava.

Jobling, Malcolm. 1995. *Environmental Biology of Fishes*. London: Chapman & Hall.

Kasekamp, Andres. 2010. *A History of the Baltic States*. Basingstoke and New York: Palgrave Macmillan.

Kirss, Kaarel, A. Lilberg, Jaan Port and Edur Tasa. 1934. *Suvine loodus. Loodusloolisi saateaineid algkoolile. IV vihik* [Nature in summer. Additional reading in natural history for elementary schools, part IV]. Tartu: Loodus.

Kull, Kalevi (ed.). 2001. *Semiotica*, 134(1/4). Berlin: de Gruyter.

Maran, Timo. 2007. 'Liikidevaheline kommunikatsioon ja Thomas A. Sebeoki uurimisplatvorm' [Inter-species' communication and the research platform of Thomas A. Sebeok] in Rattasepp, Silver and Timo Maran (eds) *Kommunikatsiooni teooria. Schola Biotheoretica* [Theory of communication. Schola Biotheoretica]. Tartu: Eesti Looduseuurijate Selts: 36–47.

—. 2008. *Mimikri semiootika* [Semiotics of mimicry]. Tartu: Tartu Ülikooli Kirjastus.

Martinelli, Dario. 2007. *Zoosemiotics: Proposals for a Handbook*. (Acta Semiotica Fennica XXVI.) Helsinki and Imatra: International Semiotics Institute.

Merrell, Floyd. 2001. 'Charles Sanders Peirce's Concept of the Sign' in Paul Cobley (ed.) *Routledge Companion to Semiotics and Linguistics*. London and New York: Routledge: 28–39.

Mordue, Tom. 2009. 'Angling in Modernity: A Tour through Society, Nature and Embodied Passion' in *Current Issues in Tourism*, 12(5–6): 529–552.

Morris, Charles. 1972 [1938]. *Writings on the General Theory of Signs*. The Hague: Mouton.

Murphy, Patrick D. 1995. *Literature, Nature and Other. Ecofeminist Critiques*. Albany: State University of New York Press.

Nöth, Winfried. 2001. 'Ecosemiotics and the Semiotics of Nature' in *Sign Systems Studies*, 29/1: 71–81.

Ojaveer, Evald, Ervin Pihu and Toomas Saat. 2003. *Fishes of Estonia*. Tallinn: Estonian Academy Publishers.

Pain, Stephen Philip. 2008. 'Inner Representations and Signs in Animals' in Barbieri, Marcello (ed.) *Introduction to Biosemiotics*. Dordrecht: Springer: 409–455.

Phillips, Dana. 1996. 'Is Nature Necessary?' in Glotfelty, Gheryll and Harold Fromm (eds) *The Ecocriticism Reader. Landmarks in Literary Ecology*: 204–222.

Pihu, Ervin. 2006. *Meie kalad olelusvõitluses* [Our fish in the struggle for life]. Tallinn: Kalastaja Raamat.

Sebeok, Thomas A. 1986. 'Naming in Animals, with Reference to Playing. A Hypothesis' in *I Think I Am A Verb: More Contributions to the Doctrine of Signs*. New York: Plenum Press: 82–96.

—. 1990. *Essays in Zoosemiotics.* Toronto: Toronto Semiotic Circle.

—. 1994. *Signs: An Introduction to Semiotics*. Toronto and Buffalo: University of Toronto Press.

—. 2001. 'Nonverbal Communication' in Cobley, Paul (ed.) *Routledge Companion to Semiotics and Linguistics*. London and New York: Routledge: 14–27.

Spuhl-Rotalia, Jaan. 1896. *Kodumaa kalad: Eesti-, Liiwi- ja Kuuramaa wetes ning Läänemeres elutsevate kalade looduslugu, nende püüdmine kunstliste abinõuudega, kaswatamine, kunstlik sugutamine ja kalatiikide asutamine* [Fishes of Homeland: natural history of the fishes inhabiting the waters of Estonia,

Livonia and Curonia and in the Baltic Sea, their catching, hatching, breeding and instructions on establishing fish ponds]. Viljandi.

Talve, Ilmar. 2004. *Eesti kultuurilugu: keskaja algusest Eesti iseseisvuseni* [Estonian cultural history: from medieval ages to the beginning of independent Estonia]. Tartu: Ilmamaa.

Tüür, Kadri. 2007. 'Looduskirjanduse määratlus' [Nature writing: a definition] in Salupere, Silvi and Elin Sütiste (eds.) *Acta Semiotica Estica* 4: 73–96.

Uexküll, Jakob von. 2010 [1934]. *A Foray Into the Worlds of Animals and Humans: With a Theory of Meaning* (tr. J.D. O'Neil). Minneapolis and London: University of Minnestota Press.

Unt, Liina. 2005. 'Meri ja mere pilt' [Sea and marine painting] in Maran, Timo and Kadri Tüür (eds.) *Eesti Looduskultuur* [Estonian culture of nature]. Tartu: Eesti Kirjandusmuuseum: 129–150.

Vahtra, Jaan. 1982. *Metsajärv* [Lake in forest]. Tallinn: Eesti Raamat.

V., E.J. 1939. 'Kala, kes "püüab" kalameest' [Fish that "catches" the fisherman] in *Huvitav žurnaal*, 4: 4–11.

V

Tüür, Kadri, Stern, Karl 2015. Atlantic herring in Estonia:
In the transverse waves of international economy and national
ideology. *Journal of Baltic Studies* 46(3), 393–408.
DOI: dx.doi.org/10.1080/01629778.2015.1073928

Journal of Baltic Studies
Vol. 46, No. 3, September 2015, pp. 393–408

Routledge
Taylor & Francis Group

ATLANTIC HERRING IN ESTONIA: IN THE TRANSVERSE WAVES OF INTERNATIONAL ECONOMY AND NATIONAL IDEOLOGY

Kadri Tüür and Karl Stern

This article examines the background of and reasons for a sudden decrease in the Estonian import of Atlantic herring during the Great Depression in 1932. The economic and ideological factors that influenced the process are discussed, including protectionist trade policy measures, customs regulations and nontariff trade measures. We argue that the attempt to replace herring imports by establishing a national herring fishing fleet was grounded in ideological as well as in nutritional arguments. Such protectionist measures were met with confrontation by Estonian foreign trade partners. The case study highlights a complicated interplay between oceanic resource exploitation politics and national ideologies, locating it in the context of regional environmental historical research.

Keywords: protectionism; international trade; Atlantic herring; food history; fishery; oceanic resource exploitation

As a renowned environmental historian, Helen M. Rozwadowski (2001, 221) has pointed out, oceans are not just an immensely rich environment and a source of livelihood, but they are also a contested playground of national powers and commercial interests. In this article, we combine textual analysis and research on economic history in order to present a case study of Estonia's attempt to develop a national fishing fleet in the northern part of the Atlantic Ocean in the 1930s, the period of the Great Depression and the subsequent years when European nation states, including Estonia, devised and tested different solutions for the unfavorable economic situation. The central object of our study is Atlantic herring as a food and trade object that occupied an important place in Estonia's food economy and that became the subject of the highly controversial policy, leading to the drastic drop in fish imports in 1932. We locate the Estonian case study in the context of European agricultural commodity

Correspondence to: Kadri Tüür, Department of Semiotics, University of Tartu Jakobi 2, 51014 Tartu, Estonia.
Email: tyyr@ut.ee

ISSN 0162-9778 (print)/ISSN 1751-7877 (online)
http://dx.doi.org/10.1080/01629778.2015.1073928

markets, primarily in relation to the United Kingdom as one of the main trade partners of the Republic of Estonia of the time, as well as in relation to international herring fishing activities. Our purpose is to highlight the cultural and ideological constructions of the economic categories of domestic and foreign goods that were implemented in the Atlantic herring case. Such a categorization is an aspect of the foreign trade history that has not yet received attention in the earlier historiography.

It is generally acknowledged that when facing economic depression many countries sank into heavy protectionism in the 1930s. Liberal policies were both unpopular and uncommon, and many European countries, including Estonia, introduced a wide range of nontariff trade measures in efforts to protect their economies (Klesment 2000; Raud 1934/35). European as well as Estonian research on the economic history of this period mainly deals with the extent of and reasons for the protectionist policies in the general context. What has not yet been covered in Estonian research is the detailed analysis of designating a particular group of goods as domestic or foreign in the context of global market competition. Our research presented in this article addresses this issue.

In her monograph on Estonian foreign trade in 1918–1940, Estonian economic historian Maie Pihlamägi notes that the import of Atlantic herring that had comprised 90% of Estonian fish imports during the earlier years dropped drastically in 1932. She suggests that one of the reasons for such a decrease might be a change in the preferences of consumers, who opted for domestic meat and butter instead of the more expensive imported fish (Pihlamägi 2004). Foreign trade statistics seem to support this dynamic: Atlantic herring (and the relatively insignificant quantities of imported Baltic herring and pilchard) formed 1.3% of the whole import volume of the Republic of Estonia in 1931, but only 0.3% in 1932. In 1933, the share of Atlantic herring in Estonian imports rose again, remaining around 1% until 1939. Pihlamägi's argument that there was a relation between imported herring and domestic agricultural products provides a hypothesis to be studied, namely whether domestic products were set into opposition with foreign products and to what extent. Another and by no means less important question concerns the nature of the domestic products that were actually preferred over the imported Atlantic herring. The revision of the categories of domestic and foreign is pertinent here, as according to statistics, Atlantic herring was one of the key import articles in the trade group of food, spices, and drinks. In 1930, grain (both seed and ground), sugar, and herring were the top import articles in this trade group, forming respectively 13.2%, 5.2%, and 1.3% of Estonian import (Pihlamägi 2004). At the same time, local consumers already had an alternative to the consumption of Atlantic herring in the form of locally caught fish.

Our task in this project is to explore the possible reasons for the sudden but short-term drop in herring imports to Estonia in 1932. More specifically, we ask: were the forcefully implemented protectionist politics, combined with the propaganda in favor of domestically produced food items, among the major causes for the decrease in herring imports? The article provides a survey of the trade policy measures, especially the nontariff measures, implemented in Estonia during the Great Depression, that were used in the case of Atlantic herring.

Second, the ideological background for the "domestication" of the Atlantic herring is to be analyzed. This will be done on the basis of the media coverage of the "herring issue," especially in Estonian daily newspapers and in periodicals devoted to the

advancement of the Estonian ocean fishing industry.[1] We will particularly focus on the travelogue of Estonian writer, essayist, and playwright Evald Tammlaan (1904–1945) who documented the first open-sea fishing trip organized by the Estonian company OÜ Kalandus [Fishery Company].

The third important question concerns the reasons why the sudden decrease in herring imports only proved to be short term. The reasons, as we may hypothesize, are again both economic and ideological. We ask whether the consumption of domestic food was propagated in Estonia in the 1930s at the expense of the imported Atlantic herring, and whether such protectionist activities met confrontation from Estonia's foreign trade partners.

The main sources related to the implementation of different trade policy measures in the 1930s are legislative acts and treaties of commerce, published in the state legislative periodical *Riigi Teataja* [State Gazette]. The reasons for their enforcement could be gleaned from archival documents belonging to the materials of several state institutions, such as the Ministry of Commerce, the State Chancellery, and the Parliament, held in the State Archives.[2] The primary source for the statistics of commerce is the periodical *Väliskaubandus* [Foreign Trade Bulletin], the official gazette for the publication of data on Estonian foreign trade.

Herring Imports and Protectionist Trade Policy

Salted Atlantic herring (*Clupea harengus harengus*) has formed a substantial part of European trade since the Middle Ages (Sicking and Abreu-Ferreira 2009; Põltsam 2008). Unlike many other seafood items, salted herring can be transported and stored over long distances and periods of time without losing its nutritional and gustative qualities. As its name indicates, Atlantic herring (*Clupea harengus harengus*) inhabits the waters of the Atlantic Ocean, and it usually grows to be 37 centimeters long, while in the coastal waters of Iceland, it can reach up to 42 centimeters. Individual specimens can weigh up to 0.5 kilograms. Herrings are oily fish whose meat is rich in Omega-3 fatty acids. It is also a source of vitamin D, having thus been an important addition to the predominantly grain-based menus of peasants.

The inhabitants of Estonia did not participate in catching or processing Atlantic herring. Nor did they encounter the species in the Baltic Sea as it prefers saltier waters. Herring reached Estonian consumers as a salted good ready for consumption. Since the seventeenth century, United Kingdom has been the leading European country in terms of herring production, ceding its position to Norway only between the two World Wars (Oras and Sammet 1982, 82; Schwach 2013).

For the Baltic area, the local subspecies of herring, *Clupea harengus membras*, is an important counterpart to the Atlantic herring. It lives east of the Danish Straights. Baltic herring is merely 20 centimeters long and its life lasts but for 6–7 years. The general name for Baltic herring processed for food in Estonian is *silk*; linguistic evidence reveals connections with Latvian and Lithuanian fish-eaters (Atlantic herring in Latvian is *silke* and in Lithuanian *silkė*). Atlantic herring is referred to by its international name, *heeringas*, in Estonian. According to Aliise Moora, the prominent scholar of Estonian food culture, the main food items for Estonian peasants have

traditionally been black bread and Baltic herring. Atlantic herring gradually became an everyday food instead of a festivity food over the course of the nineteenth century (Moora 2007, 346, 368).

With the establishment of independence in 1918, the young Republic of Estonia faced numerous economic problems. One of the important tasks was to look for new export markets for domestic production. The vast market of the Russian Empire virtually disappeared for Estonian products behind the newly established state borders. Estonian foreign trade had to reorientate itself toward western Europe. The British government was among the first foreign countries to show interest in establishing a commercial treaty with the Republic of Estonia as they saw great potential in the transit trade through Estonia to its neighboring countries. The first official trade treaty between Estonia and the United Kingdom was signed in 1920. After that, the United Kingdom took second position after Germany in terms of Estonian foreign trade volume and became the most important export market for Estonian agricultural products until WWII (Pihlamägi 1999, 89–91). The trade and shipping treaty between the United Kingdom and Estonia stated, among other issues, that Estonia should promote employing British vessels, merchant and passenger ships alike (Pärna 1979, 87).

In 1929, 97% of the Atlantic herring imported to Estonia came from the United Kingdom (Pihlamägi 1999, 92). Smaller amounts were imported from other countries, such as Sweden and Norway. Estonian fishermen were engaged locally in coastal fishing, but the exploitation of ocean resources was well beyond their reach in the 1920s. Estonian periodicals monitored the statistics and published overviews of the fish trade on a regular basis. The comparison between the consumption of domestically produced Baltic herring and imported Atlantic herring was one of the central issues discussed (cf. *Päevaleht* [*Daily news*] 1923, 5).

The collapse of the international lending market after 1929 caused an impact on most of Central and Eastern European countries. The financial panic of 1931 drove those countries to restrict international payments by introducing exchange control measures (Irwin 1993, 90–119). The countries that had remained on the gold standard experienced overvaluation of their national currencies, which had a negative effect on their trade balance. In order to maintain a trade balance and preserve the higher value of their national currencies, states started using licensing systems, exchange control, clearing agreements, and other measures. The situation urgently raised the question of what goods Estonia should import and what could be produced domestically.

At that time, approximately 60% of the Estonian people earned their living from the agricultural sector (Valge 2003).[3] Therefore, it is not surprising that protectionist measures were implemented in Estonia especially with regard to agricultural produce. Foodstuffs and spices and drinks amounted to a third of total imports, but the figure dropped noticeably in 1930.

As for herring, in 1925 and 1926, its imports constituted 3.4% of the total value of Estonian imports, indicating its importance in the daily diet of the population of Estonia. Even in 1931, when the world market prices of agricultural produce and fish products had dropped, the figure was 1.3%, but in 1932 it only amounted to 0.3%. After 1932, the proportion of herring imports increased again and even reached the 1931 level at the end of the decade. However, it never returned to the level of the 1920s.

At the end of 1931, the Estonian *Riigikogu* [Parliament] passed the Organization of Goods Import Act that introduced the licensing system in Estonia (RT 1931, 90, 670). The Act stipulated that the government has the right to impose a national exclusive right of import with regard to certain goods, and it was regularly updated. The adoption of such an act was nothing new in the European context (Irwin 1993, 90–119). In essence, the Act gave the government the right to monopolize the import of certain goods. At the end of 1931, the government established control over nearly 40% of imports. The 1932 regulation included the import of herring in the licensing system, which gave the government the right to start regulating herring import quantities and thereby gain an additional mechanism for generating currency savings (RT 1932, 51, 450).

For the purpose of achieving currency savings, exchange control was implemented in Estonia in 1931. Under the conditions of exchange control, the government exercised control over the foreign currency received for the exported goods and decided how to divide it between the importers. The national bank obtained the exclusive right to perform foreign currency transactions. Similarly to the licensing system, the use of exchange control was common in Europe in that period. The largest country to use exchange control was Germany.[4]

The more successful functioning of exchange control was in turn facilitated by the licensing system. The fewer import permits the Ministry of Economic Affairs issued, the smaller the importers' demand for foreign currency from the Bank of Estonia was. A herring importer had to obtain an import permit from the Ministry of Economic Affairs. If currency savings were considered more important than herring imports, enterprises did not receive an import permit.

The licensing system with exchange control gave the state the right to regulate the quantity of imported goods. In the context of trade statistics, that meant a general reduction in foreign trade volumes. In 1932, foreign trade volume fell to 79.5 million kroons from the 132.3 million kroons of 1931, while only in 1929 it had amounted to 240.5 million kroons (see Figure 1).

Under the Organization of Goods Import Act, licenses were issued mainly for the goods that had no alternative in Estonia. As it was believed that domestic foodstuffs could easily substitute Atlantic herring, the import of herring was also decided to be licensed. The British government did not welcome this decision or the implementation of tariff-related measures.

The increase in tariff rates in several countries could be considered as an introductory step toward the world economy sinking into protectionism. In the summer of 1929, tariff rates were increased in Germany, France, and Italy and toward the end of the year also elsewhere in Europe. In 1931, several draft acts were presented to the Estonian *Riigikogu*, proposing radical increases in tariff rates that were considered as self-defense, creating a protective environment for the Estonian industry (ERA.969.3.270, 143; ERA.969.3.267, 13). The desire to increase tariff rates also entailed a monetary and fiscal policy objective.

According to initial plans, the customs duty on herring was to be tripled. The former minimum tariff[5] of 0.022 kroons per gross kilogram was to be replaced with 0.07 kroons (ERA.969.3.267, 143). It was presumed that the increase of the tariff rate would reduce the import of herring and help achieve currency savings. Many also

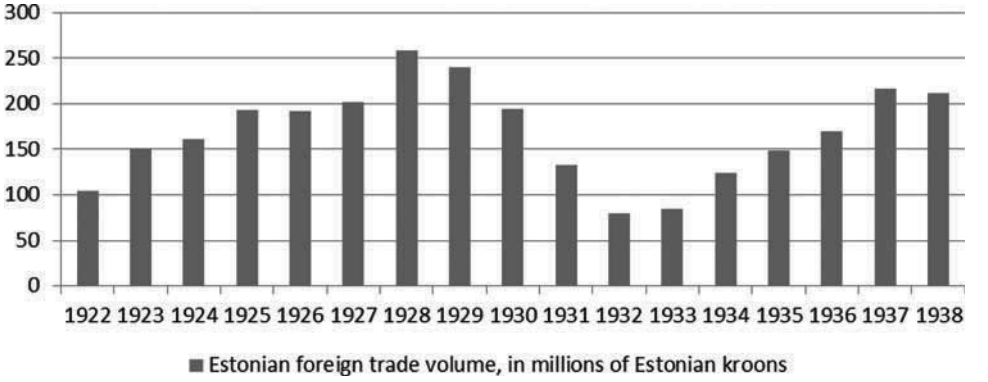

FIGURE 1 Estonian foreign trade volume, in millions of Estonian kroons.

Notes: The decrease in Estonian foreign trade volume clearly shows that the decline in the import of herring characterizes the whole of foreign trade. Foreign trade volumes decreased considerably more than GDP. By estimation, the world GDP decreased by 20% and the foreign trade volume by 40% during the Great Depression (Irwin 1993, 90–119). The downturn in foreign trade was largely caused by protectionism, which had started spreading intensively at the end of the 1920s.

Source: Pihlamägi (2004).

hoped that the higher tariff rate would help replace foreign herring with local Baltic herring and sprat, which were difficult to market elsewhere (ERA.969.3.267, 129). When the Act Amending the Basic Customs Tariffs Act was finally passed, the minimum tariff on herring remained unchanged at 0.022 kroons per gross kilogram (RT 1933, 63, 491). The regulation contains a notice: "Atlantic herring caught by Estonian ships outside the territorial waters of Estonia will not be taxed." As it was considered important by legislators to include such notice in the text of the act, it evidently had caused some controversies and was thus regarded as an important issue to be clarified. It was stated in the explanatory memorandum that despite the relatively large proportion of the import of herring a considerable increase in the customs rate was not considered possible so as not to impair the people's nutrition conditions (ERA.969.3.267, 496).

The Estonian Quest for Herring

Limiting herring imports by means of the licensing system resulted in a remarkable decrease in that particular segment of trade in 1932. A number of people active in the fishery and fishing business were discontent with both the expenses on imports and the prospective removal of salted Atlantic herring from the domestic market, which had for a long time been a traditional part of the Estonian food culture. The state campaign for replacing imported herring with domestically produced food yielded some rather biased opinion stories in local periodicals. Herring was explicitly constructed as the main competitor of "domestic" fish (A.G. 1930, 50)[6] and depicted as a tasteless "stomach filler" (Keller 1928, 237–39). It was pointed out that in Finland educated

people preferred domestic fish to low-quality Atlantic herring that, in contrast, was favored in Estonian parvenu circles (A.H. 1928, 219).[7] It was even suggested that eating salted herring was a Russian custom characteristic of a "backward culture" (Šoberg 1930, 190). In addition to promoting domestic fish, however, Šoberg (1930, 191) also proposes "domestication" of herring fishing by blocking herring imports with high customs tariffs and developing an Estonian herring flotilla, following the example set by Finnish neighbors.

On January 21, 1931, the *Postimees* [Postman] daily – actually delivering false information – stated in a reproaching tone that Estonia imported Atlantic herring for almost 3 million kroons each year.[8] The main message of the article was – domestic production should be favored. Estonian periodicals of the time closely monitored the developments in fish production and sales in Finland, Latvia, Russia, and Poland. In 1930–1931, a sequence of short notices was published in the journal *Laevandus ja Kalaasjandus* [Shipping and Fishery] that quite clearly illustrate the escalating excitement about "taming" the herrings of far-away waters: in the August/September issue of 1930 (*Laevandus ja Kalaasjandus* 1930, 176), it was reported that Finland had sent its herring flotilla consisting of three trawlers and one mother ship to the Atlantic Ocean on June 1, and that they had returned at the beginning of September with more than 10,000 barrels of herring that had been sold in Finland with great success. In the June issue of the next year (*Laevandus ja Kalaasjandus* 1931a, 118), a report about a Polish herring fishing expedition appeared: encouraged by the success of the Finns, Polish fish traders planned to buy four to six trawlers from the Netherlands and set off for their own quest for herring. The continuing success story of the Finns was reported in August/September of 1931 (*Laevandus ja Kalaasjandus* 1931b, 193) – that year, two herring expeditions produced more than 20,000 barrels of herring and the public expressed hopes that soon the whole Finnish herring demand would be covered by domestically produced herring only. "As Finland lacks people competent in herring fishing, both expeditions were led by hired Norwegian experts, but in the nearest future the Finnish fishers expect to be competent enough to catch herring without any foreign help," the report concludes (*Laevandus ja Kalaasjandus* 1931b, 193).

Further public appeals about the need to diminish the import of herring in the context of the global economic crisis at the expense of favoring locally produced fish products were published in *Laevandus ja Kalaasjandus* in 1932 (J.J., 7/8, 14–15[9]; s.n. 11/12, 61–62). It was stressed that "our own" or Estonian specialists in herring fishing should be educated and new opportunities should be created for them, as currently there was neither experience nor expertise in ocean fishing in Estonia. The desire for alimentary sovereignty was an idea that swept across Europe during the interwar period, with Italy being the most famous example (Helstosky 2004, 1–26). The situation led to a daring move, the establishment of an Estonian national ocean flotilla for herring fishing in 1932. It is interesting to point out that the media coverage presented economic and ideological arguments, but no scientific surveys regarding the estimations of herring populations in the northern Atlantic or the general concerns of ocean resource exploitation that were available at that time (Rozwadowski 2002) seem to have been considered in devising the project.

On February 9, 1932a, *Päevaleht* reported without mentioning any names that "some businessmen, mainly mariners, were planning to start fishing for Atlantic herring near Iceland this spring." Forty female fish salters were to be hired from Tallinn, and some Norwegian specialists were to supervise them. The initial plan also included a hired Junkers hydroplane from which the surfacing fish shoals could be spotted.[10]

For the purpose of advancing domestic herring production, OÜ Kalandus [Fishery Company] was established in Tallinn on April 2, 1932 (Luhaveer 1996, 134). It had 18 shareholders, most of them natives of Northern Estonian coastal villages, the region where many young men traditionally chose to earn their living in maritime affairs. This was also the region that was most actively engaged in the illegal spirit trade with Finland in 1919–1932 (Pullat 1993, 183–96). As Prohibition was abandoned in Finland in April 1932, the men and vessels that had previously been engaged in smuggling were ready for new employment opportunities. On March 17, 1932b, *Päevaleht* published a thorough report on the preparations of the first Estonian herring expedition, stating plainly that three former spirit ships were to be rebuilt as herring trawlers. The link between spirit smuggling and herring fishing through legalizing the accumulated capital is also repeated in historiography (Oras and Sammet 1982, 82). The rebuilt trawling vessels were accompanied by a mother ship, *Eestirand,* that was bought specially for that purpose from the United Kingdom.

The necessary coal and salt for the first Estonian herring expedition were also bought from the United Kingdom. Herring nets, winches, and other hauling equipment, boats, and barrels were to be obtained from Norway as well as the hired "foreign specialists" to lead the fishing process and instruct in salting. In addition to Estonian fish salters, some of the "herring maids" also came from Finland. *Päevaleht* (March 17, 1932b) stated that the expedition would prevent spending foreign currency on herring imports and therefore support the protectionist politics of the Estonian government. As we can say in hindsight, the support was not mutual. The establishment of the Estonian herring fleet was also believed to relieve the unemployment caused by the global economic depression.

In order to initiate ocean fishing, an ideological agenda was developed to support the hoped-for economic bonuses. The quest for herring was constructed as an enterprise of national importance in the media. For propaganda purposes, journalist Evald Tammlaan[11] and film operators A. Hirvonen and Zimmermann[12] were hired by the fishery entrepreneurs to accompany the ships and document the whole event. As a result, an hour-length film about herring fishing[13] and a 24-part travelogue of the expedition titled *Yankee Man's Herring Letters* were produced. The travelogue featured preparations and departure of the expedition, the fleet's travel to the fishing grounds, descriptions of the Norwegian and Icelandic ports and countryside, but most importantly, it documented the daily life and work on the board of the ships, the practicalities of herring fishing, and commented about the economic context of the whole enterprise. This comprises abundant, yet often overlooked materials about the background of the Estonian "quest for herring," as well as of the daily experience of the Estonian herring fishers of the 1930s.

No scientists were included in the crew of the first Estonian herring expedition. In 1933, ichthyologist Aleksander Määr from the University of Tartu joined the herring

fleet. His study results have been introduced briefly in local media (*Päevaleht*, September 13, 1933a; October 21, 1933b), but it remains unclear whether his contributions made it to international ocean studies.

The rhetoric used in newspaper reports on the herring flotilla constructs the entrepreneurs and crews as "our Vikings,"[14] who shall venture into the unknown in the quest for the "ocean vagabonds" (i.e., herrings). The mother ship is portrayed as "the hugest ship ever that has sailed the seas under the blue-black-white flag" and the flotilla is depicted as "our small and swaying colony that brings the colors of the Estonian flag to the eternal waves of the vast open seas" (*Päevaleht*, May 29, 1932c). This corresponds to Helen M. Rozwadowski's (2001, 220) observation about the mid-nineteenth century: marine naturalists and other ocean explorers shared the political motive of demonstrating national power.

The mother ship was sent off from Tallinn with a festive mess that was featured in the photo reportage on the front page of *Päevaleht* on June 11, 1932d. The Norwegian instructors were reported to be content with the equipment of the ships; also the light and dry fish barrels of Finnish origin were praised. The fleet arrived at its destination near the Icelandic waters at the beginning of July; a week later news about the first catch, 750 barrels of herring, of the glorious "herring hunters" was reported in *Päevaleht* (July 10, 1932e), followed by the front-page report about the expected arrival of Estonian herring production in Tallinn at the beginning of August. "And those are not some meagre fish, but of the first rate, the so-called king herrings," an anonymous writer announced in *Päevaleht* (July 15, 1932f).

The same news item also raised the question of tariff rates. Hope was expressed that if it was possible to sell cheaper herring with reduced tariff rates, more people could afford buying it. This would lead to considerable improvement of the overall nutritional conditions of the Estonian people. Thence, economic interests were veiled with the rhetoric of social welfare and national health.

The first actual catch of herring is depicted by Tammlaan as a major adventure. As it must have been the first encounter with live Atlantic herring for most of the crew, the excited tone of the reportage is only natural. The first alarm sounds at six in the morning, but the shoals descend before the boats complete besiege. After a couple of hours the maneuver is repeated and the first herring are caught in the nets. Tammlaan writes,

> And all of a sudden, the sea by the ship comes alive. Greenish-blue backs swarm and drop glittering scale spangles. A Norwegian jams an oar straight down – it stands – sways – is erect. It is as if pure silver gleams in the deep blue water. Fat, plump bodies jump into the air. . . . Men run and heap up at the big reservoir: everybody wants to be the first one to touch the first catch. They sure are big, fat fish – makes one wonder – if one remembers the thin, salty skins that one has sometimes mistakenly bought for herring in Estonia. Here the fish are so soft that one may squeeze it through one's fingers upon seizing it, just like a well-ripened plum – so that the fat drips from between the fingers. (*Päevaleht*, July 26, 1932a, 6)

The images of silver color and softness of the fish recur throughout the text. Traditionally, the image of fat is associated with affluence. The excitement of the catch, combined with the promise of the prospective wealth, is combined with a sense of wonder with regard to

the fish as a live shoal: the density of the caught fish in the trawling net, the movement and the plumpness of the bodies, the tactile sensations that the crew members had never experienced before. We also see the continuation of the disparaging rhetoric pointed at the presumably low quality of the imported herrings.

Herring Catches and International Pressure

The descriptions of the routine fishing activities in the *Yankee Man's Herring Letters* bear the mark of (partly unfair) competition among the foreign ships that had gathered in the neutral waters close to the Icelandic coast where the herring shoals moved about. Internationally, the ICES had identified problems with overfishing in the North Sea in 1930, and governments were urged to survey new, offshore fishing areas (Rozwadowski 2002, 88). In practice, national fleets were competing with each other rather keenly at the previously known offshore spawning areas. This took place within the boundaries of the internationally agreed fisheries management areas that were delineated based on statistical (and political), not biological logic (Hubbard 2013, 93–4).

The Finnish newspaper *Ajan Sana* had reported Estonian fishers spying on the Finnish trawlers via their radio connections (*Päevaleht*, July 30, 1932g). "The feelings of kindred nations are to be kept separate from the business," as Tammlaan puts it in a subtitle for his reportage (*Päevaleht*, August 6, 1932b). He eloquently describes the "multinational chase" after herring shoals, triggered as soon as any of the ca. 30 ships lingering at the sight of each other have spotted signs of a shoal. "No law prevents such action – it is a free sea," he states. The one who is able to move to the shoal faster is the "winner" and gets the fish. "The sea swarms with boats and nets," he writes. "Curse words in Finnish, Norwegian and Estonian sound over the waves. Ships whistle for the sign of warning; the men in boats call monotonously 'ho-hoi' as they haul the herring nets to the boats" (*Päevaleht*, August 6, 1932b).

From this description, it becomes evident that the endeavor of herring fishing was far from being a heroic national conquest; the reality of the everyday practice on the ocean resembled more of elbowing one's way to herring in a close race between the herring hunters of different nationalities – Finnish, Norwegian, Polish, and Icelandic. According to the reports (*Päevaleht*, July 15, 1932f; September 3, 1932c), Spanish and French herring fleets had already left by that time; the Scottish fleet was fishing somewhat more off the coast, and the Latvians arrived only at the beginning of August.

The more experienced herring catchers probably perceived the ships of the Estonian herring fleet that had had no previous claims in the waters of the North Atlantic as foreign intruders. However, the smaller amount of catch per ship evidently caused more worries to the "herring chasers" than overfishing. The situation probably also contributed to the later collapse of fish stocks, as experienced in Norway (Schwach 2013, 104). Michael Graham explicates the pattern in "the great law of fishing" in 1935, suggesting that fisheries with unrestricted access eventually become unprofitable (Rozwadowski 2002, 91; Hubbard 2013, 91). Regardless of the harsh conditions both in and around the ships, OÜ Kalandus' first herring season was an economic as well as emotional success.

In June 1933, however, the United Kingdom demanded that Estonia promptly remove all obstructions to the import of herring. This demand can be regarded in the context of the general British foreign trade policy that focused especially on these groups of trade articles that had suffered the most notable declines during the Depression (Pihlamägi 2004, 280–82). At the end of the 1920s, herring was the main export article of the United Kingdom to Estonia and Latvia (Rooth 1993, 193). By 1932, the value of fish imports from the United Kingdom had dropped from 2.6 million kroons in 1926 to 0.1 million kroons, that is, the Estonian market was virtually lost for the British herring (Pihlamägi 2004, 273). The dramatic loss in the value of British herring production in 1931–1935 was not comparable to the slight decline in fishing quantities during the same period (*Lecture Notes on the Herring* 1938, 8). As the import of herring to Estonia had diminished disproportionally, the United Kingdom wanted to restore the earlier market situation.

Using diplomatic and economic pressure from the United Kingdom, the two countries concluded the so-called "Herring Agreement" on July 15, 1933. The agreement, signed for 1 year, entered into force on 22 July, that is, the same date on which the herring was expected to be excluded from the list of goods subject to the licensing system. The agreement had an immediate effect on the import of herring. In 1933, the total value of herring imports from the United Kingdom increased to 325,183 kroons. In just a year, from 1932 to 1933, the proportion of Atlantic herring imports to Estonia more than doubled (see Figure 2).

Thus, the increase in the import of herring after 1932 does not necessarily indicate principal alteration of the Estonian trade policy, but rather the United Kingdom as the most important trading partner asserting its wishes. As the export of goods to the United Kingdom formed approximately a third of Estonia's total exports, it would have been difficult for Estonia not to sign the 1933 Herring Agreement. Without the initiative of the United Kingdom, the import of herring could have been considerably

FIGURE 2 The percentage of herring in Estonian imports. The significant drop in herring imports in 1932 is clearly seen in this graph.

Source: Pihlamägi (2004).

more limited. Thence, the brave rhetoric of the national quest for herring in the local media was in reality replaced by the rationale of a foreign trade balance.

Conclusion

Food and its trade dynamics are influenced by both the ideological stance of the nation state and the international economic and political situation. The reasons for sudden leaps in the trade balance of traditional food items, such as Atlantic herring, cannot easily be explained away by changes in consumers' preferences. The reasons why Estonia experienced a sudden decrease in the import of Atlantic herring in 1932 were manifold. The Great Depression with the subsequent wave of protectionism in many countries, including Estonia, was the most evident reason. The Estonian government decided to apply an array of tariff- and nontariff trade measures to protect its domestic market, where foodstuffs, spices, and drinks formed a considerable segment. These measures turned out to have mixed results in the long term. The United Kingdom, as one of the major trade partners and export markets for Estonia, disagreed with a number of measures taken and applied diplomatic pressure to lift them. Licensing and raised tariffs played a central role in Estonia's import of Atlantic herring from the United Kingdom.

At the same time, local calls for national food sovereignty that was framed as the necessity to limit imports of foodstuffs that could be produced locally, on the one hand, consisted of the ideology-laden argument constructing Atlantic herring as an undesirable item in Estonian food culture. Following the same line of argumentation, an Estonian capital-based company, OÜ Kalandus, was established early in 1932, with the aim of founding Estonian ocean fishing using domestic capital and labor. The national media portrayed this first voyage of the fishing fleet as a heroic quest for Atlantic herring and a victorious conquering of distant waters and their riches.

Reality, however, differed from the ideal picture: the international waters off the coast of Iceland swarmed with the similar fleets of other European countries, and the Estonian workforce was inexperienced in encountering live herring. The domestic regulations concerning the tariff rates and the general foreign trade agreements of the Republic of Estonia of that time were not favorable to the enterprise either. As a result of the dynamics in international trade policies, Estonia's quest for Atlantic herring did not prove sustainable. Following the notes from the United Kingdom, it had to open its market to imports. This course of events did not solve the problem of overexploitation of the oceanic resources in the Atlantic Ocean, but the Estonian case study demonstrates how little such concerns weighed in the face of national and commercial interests.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This research was supported by the European Union through the European Regional Development Fund (Centre of Excellence CECT), by the Estonian Research Council

grants Semiotic Modelling of Self-Description Mechanisms: Theory and Applications [IUT2-44], Dynamical Zoosemiotics and Animal Representations [7790], and EEA Norway Grants Animals in changing environments: Cultural mediation and semiotic analysis [EMP 151].

Notes

1. The retrospective analytical bibliography compiled in the Department of Bibliography in the Archival Library of the Estonian Literary Museum, and the portal of Digitized Estonian Newspapers, dea.nlib.ee, have been invaluably useful sources for obtaining material for the present article.
2. We wish to thank the State Archives of Estonia for providing assistance with the documents concerning the Estonian foreign trade regulations of the 1930s.
3. Agriculture included farming, animal husbandry, gardening, fisheries, and forestry.
4. Besides Germany and Estonia, Austria, Bulgaria, Czechoslovakia, Denmark, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Portugal, Romania, Turkey, and Yugoslavia also implemented exchange control in Europe.
5. In the autumn of 1928, Estonia introduced two-tier customs tariffs: general customs tariffs and minimum customs tariffs. The goods of the countries that had concluded a trade agreement with Estonia were subject to the minimum customs tariff, while the products of countries that had not concluded an agreement with Estonia were subject to a set of general tariffs. The minimum customs tariff formed approximately 50% of the general customs tariff. For instance, at the beginning of 1931 the general customs tariff on herring was 0.045 kroons per gross kilogram and the minimum customs tariff 0.022 kroons per gross kilogram. It is more meaningful to focus on the minimum customs tariff, as Estonia had concluded agreements with nearly all of its important trade partners. In 1931, Lithuania, Spain, and Albania were the only European countries with which Estonia did not have a trade agreement.
6. Full name of the author is not registered in the Estonian Biographical Database.
7. Full name of the author is not registered in the Estonian Biographical Database.
8. According to archival sources, however, in 1931, the value of salted herring imported from the United Kingdom amounted to 782,392 kroons (ERA.1831.1.4349, 37) and in 1932 to 103,207 kroons (ERA.1831.1.4355, 34). The total value of the import of herring was approximately 0.8 million kroons in 1931 and approximately 0.1 million kroons in 1932 (Pihlamägi 2004, 216). The price drop that hit food products during the economic crisis naturally also reduced the value of imports, but the 1931 and 1932 herring prices did not considerably differ.
9. Full name of the author is not registered in the Estonian Biographical Database.
10. Four years earlier, a short notice had appeared in *Shipping and Fishery* about the "brilliant results" of using aeroplanes in herring fishing that enabled the behavior and location of the shoals to be monitored from the air and the information to be reported back to the flotilla (1928, 270). Estonian entrepreneurs later substituted the planned plane with "pioneer" motor boats as these were much less expensive and technically less demanding to operate.

11. According to the Estonian Biographical Database Tammlaan published under the pseudonym Jänkimees [Yankee Man], which was a general reference to seamen who had sailed across the Atlantic Ocean (cf. Past 1936).
12. Full names of the authors are not registered in the Estonian Biographical Database.
13. There is an anonymous news item about the festive screening of the film in Tallinn, published in *Päevaleht* on October 5, 1932h, but there is no record of such film in the Estonian Film Archives, nor are known the full names of the operators. There is a chronicle film dating to 1936 that includes less than 2 minutes of footage about the arrival of the herring fleet in the port of Tallinn. See filmi.arhiiv.ee/fis, search: 'heeringa' (accessed April 12, 2012).
14. The conceptualization of Estonians as vikings and Estonia as being part of the Scandinavian area already from times immemorial was a popular idea in the 1930s that was promoted in fiction and nonfiction alike (Kaljundi 2013).

References

Archival Sources

Eesti Riigiarhiiv (ERA)

Fond 969 Majandusministeerium

ERA.969.3.267, 13
ERA.969.3.267, 129
ERA.969.3.267, 143
ERA.969.3.267, 496
ERA.969.3.270, 143

Fond 1831 Riigi Statistika Keskbüroo

ERA.1831.1.4355, 34
ERA.1831.1.4349, 37

Printed Sources

A.G. 1930. "Väliskalakaubandus 1929." *Laevandus ja Kalaasjandus* 3 (46): 49–50.

A.G. 1931. "Kolme Miljoni Krooni Eest Heeringaid Aastas!" *Postimees*, January 21, 4.

A.H. 1928. "Märkeid Soome Kalaasjandusest." *Laevandus ja Kalaasjandus* 9 (29): 218–20.

Helstosky, C. F. 2004. "Fascist Food Politics: Mussolini's Policy of Alimentary Sovereignty." *Journal of Modern Italian Studies* 9 (1): 1–26. doi:10.1080/1354571042000179164.

Hubbard, J. 2013. "Mediating the North Atlantic Environment: Fisheries Biologists, Technology, and Marine Spaces." *Environmental History* 18 (1): 88–100. doi:10.1093/envhis/ems116.

Irwin, D. A. 1993. "Multilateral and Bilateral Trade Policies in the World Trading System: A Historical Perspective." *New Dimensions in Regional Integration*, edited by J. de Melo, and A. Panagariya, 90–119. Cambridge: Cambridge University Press.

Kaljundi, L. 2013. "Väljatung Kui Väljakutse. Eesti Viikingiromaanid ja Mälupoliitika 1930. Aastatel." *Keel ja Kirjandus* 8–9: 623–44.

Keller, A. 1928. "Kalakaupade Osa Meie Väliskaubanduses." *Laevandus ja Kalaasjandus* 10 (30): 237–39.
Klesment, M. 2000. "Eesti Väliskaubanduspoliitikast Kahe Maailmasõja Vahelisel Perioodil (Eesti-Saksa Kaubandussuhete Baasil)." *Ajalooline Ajakiri* 1: 81–88.
Luhaveer, O. ed. 1996. *Mereleksikon*. Tallinn: Eesti Entsüklopeediakirjastus.
Moora, A. 2007. *Eesti Talurahva Vanem Toit*. Tartu: Ilmamaa.
Oras, R., and J. Sammet. 1982. *Lahekäärust Ookeaniavarustele. Eesti Kalanduse Ajaloost*. Tallinn: Valgus.
Past, E. 1936. *Meresõidu Romantikat ja Traagikat*. Tallinn: Tallinna Merekooli Lõpetanud Kaugesõidkuaptenite Ühingu Kirjastus.
Pullat, R. 1993. "Aus der Geschichte des Schmuggelhandels mit Spiritus zwischen Estland und Finnland in den 1920-30er Jahren." *Scripta Mercaturae* 27 (1/2): 183–96.
Pärna, A. 1979. *Meri Ja Mehed. Meresõidust Eestis*. Tallinn: Valgus.
Pihlamägi, M. 2004. *Väikeriik Maailmaturul. Eesti Väliskaubandus 1918–1940*. Tallinn: Argo.
Pihlamägi, M. 1999. "Eesti Kaubandussuhted Suurbritanniaga Aastail 1918–1940." *Acta Historica Tallinnensia* 3: 88–108.
Põltsam, I. 2008. *Liivimaa Väikelinn Varase Uusaja Lävel. Uurimus Uus-Pärnu Ajaloost 16. Sajandi Esimesel Poolel*. Tallinn: TLÜ Kirjastus.
Raud, V. 1934/35. "Rahvusvahelise Kaubanduspoliitika Uusi Meetodeid." *Konjunktuur* 2: 162–68.
Rooth, T. 1993. *British Protectionism and the International Economy*. Cambridge: Cambridge University Press.
Rozwadowski, H. M. 2002. *The Sea Knows No Boundaries: A Century of Marine Science under ICES*. Seattle: University of Washington Press.
Rozwadowski, H. M. 2001. "Technology and Ocean-scape: Defining the Deep Sea in Mid-Nineteenth Century." *History and Technology*. 17: 217–47. doi:10.1080/07341510108581993.
Schwach, V. 2013. "The Sea around Norway: Science, Resource Management, and Environmental Concerns, 1860–1970." *Environmental History* 18 (1): 101–110. doi:10.1093/envhis/ems107.
Sicking, L., and D. Abreu-Ferreira, eds. 2009. *Beyond the Catch: Fisheries of the North Atlantic, the North Sea and the Baltic, 900–1850*. Leiden: Brill.
Šoberg, J. 1930. "Soolaheeringate Sisseveo-tollide Tõstmine on Põhjendatud." *Laevandus ja Kalaasjandus*. 10: 190–191.
Valge, J. 2003. "Uue Majanduse Lätteil. Eesti Sisemajanduse Kogutoodang Aastatel 1923–1938." *Akadeemia* 10–12: 2202–28, 2443–87, 2712–35.

Periodicals

Laevandus ja Kalaasjandus
J.J. 1932. "Meie Valitsuse Imelikud Sammud Eesti Ulgumere Kalastuse Arendamisel." *Laevandus ja Kalaasjandus* 7/8: 14–15.
s.n. 1928. "Heeringapüük Õhulaevade Kaasabil." *Laevandus ja Kalaasjandus* 11: 270.
s.n. 1930. "Soome Atlandi Heeringapüük Õnnestus." *Laevandus ja Kalaasjandus* 8/9: 176.
s.n. 1931a. "Poolakad Lähevad Heeringa Püügile." *Laevandus ja Kalaasjandus* 6: 118.
s.n. 1931b. "Soomlaste Heeringalaevastik Kasvab." *Laevandus ja Kalaasjandus* 8/9: 193.
s.n. 1932. "Veel Heeringast ja Heeringatollist." *Laevandus ja Kalaasjandus* 11/12: 61–62.

Päevaleht

Jänkimees [Tammlaan, E.] 1932a. "Kuidas Püüti Eesti Esimesed Heeringad." *Päevaleht*, July 26, 6.
Jänkimees [Tammlaan, E.] 1932b. "Jänkimehe Heeringakirjad." *Päevaleht*, August 6, 6.
Jänkimees [Tammlaan, E.] 1932c. "Jänkimehe Heeringakirjad." *Päevaleht*, September 3, 5.
s.n. 1923. "Silkude, Heeringate ja Kilude Sisse- ja Väljavedu ja Tarvitamine Eestis." *Päevaleht* October 26, 5.
s.n. 1932a. "Eesti Laev Heeringapüügile." *Päevaleht*, February 9, 4.
s.n. 1932b. "Piirituselaevad Heeringaid Püüdma." *Päevaleht*, March 17, 3.
s.n. 1932c. "20 000 Heeringatündrit Välismaalt, Mida Oleks Võidud Kodumaal Teha." *Päevaleht*, May 29, 7.
s.n. 1932d. "Heeringapüügi Emalaev "Eestirand" Asus Teele." *Päevaleht*, June 11, 1.
s.n. 1932e. "Eesti Heeringalaevastiku Rikkalik Saak." *Päevaleht*, July 10, 3.
s.n. 1932f. "Värsked Heeringad Tulevad Turule." *Päevaleht*, July 15, 1.
s.n. 1932g. "Eesti Heeringalaevad Loevad Soome 'Salakeeli.'" *Päevaleht*, July 30, 2.
s.n. 1932h. "Film Eesti Heeringapüügist." *Päevaleht*, October 5, 5.
s.n. 1933a. "Islandist Tagasi Teaduslike Kollektsioonidega." *Päevaleht*, September 13, 1.
s.n. 1933b. "Kaugvete Kalastus Eesti Tuleviku Ala." *Päevaleht*, October 21, 6.
s.n. 1938. *Lecture Notes on the Herring*. London: Herring Industry Board Publications.

Riigi Teataja, official gazette for the publication of Estonian laws

RT 1931, vol. 90, art 670.
RT 1932, vol. 51, art 450.
RT 1933, vol. 63, art 491.

Kadri Tüür is a PhD student in the Department of Semiotics at the University of Tartu. Her research focuses on Estonian nature writing and its analysis. She has published articles in the areas of ecocriticism and semiotics, co-edited several article collections, and co-organized conferences in the fields of semiotics and literary studies.

Karl Stern is a PhD student in the Department of Contemporary History at the University of Tartu. His research focuses on the application of non-tariff measures in the protectionist trade policies of the Republic of Estonia in the 1930s. He is working in the Internal Market Department of the Ministry of Economic Affairs and Communications.

VI

Tüür, Kadri, Reitalu, Triin 2012. Botanical nature writing:
An ecocritical analysis. *Estonian Journal of Ecology* 61(1), 9–19.
DOI: 10.3176/eco.2012.1.03

Estonian Journal of Ecology, 2012, **61**, 1, 9–19 doi: 10.3176/eco.2012.1.03

Botanical nature writing: an ecocritical analysis

Kadri Tüür[a]✉ and Triin Reitalu[b]

[a] Department of Semiotics, Institute of Philosophy and Semiotics, University of Tartu, Jakobi 2, 51014 Tartu, Estonia
[b] Institute of Geology, Tallinn University of Technology, Ehitajate tee 5, 19086 Tallinn, Estonia
✉ Corresponding author, tyyr@ut.ee

Received 25 January 2011, revised 11 June 2011, accepted 26 June 2011

Abstract. We present an ecocritical analysis of Haide-Ene Rebassoo's book of nature writing *Botaanilisi kilde 17 Hiiumaa suvest* [Botanical Fragments from 17 Summers in Hiiumaa]. The dynamic tripartite model of nature writing is applied on the source material for advancing ecocritical theory, as well as for demonstrating the relevance of ecocriticism in the study of previously under-conceptualized texts often considered popular science. On the basis of the analysis, it is concluded that our source text features scientific, belletristic, and pragmatic dimensions of nature writing, with the main emphasis on botanical scientific knowledge.

Key words: ecocriticism, botany, nature writing, nature protection.

INTRODUCTION

The background of the present article lies in the American tradition of ecocritical literary studies and in a concept central to it, nature writing. Our purpose is to detect the tradition of nature writing in Estonia and to analyse its characteristic traits on the example of a botany-focused book. In introducing the notion of nature writing (Finch & Elder, 2002) and applying ecocritical reading (Glotfelty & Fromm, 1996) on an exemplary text (Rebassoo, 1975a), we want to test the benefits of literary analysis for texts that have been regarded as popular science in Estonian reception and left without much critical response. There is a whole array of books on natural history that in some regard conform too little to the rules of popular science, but cannot be considered fiction either. The problem is that such texts have been written for decades, but they have not received much critical attention or feedback. The lack of conceptual tools is definitely one reason for this situation.

Ecocritical interest in nature writing provides a context for re-actualizing a wide range of previously under-conceptualized publications. As a recently developed approach in literary theory that focuses on human–environment relationships (Buell, 1995; Love, 2003; Murphy, 2009), ecocriticism has taken nature writing as one of the central types of literature studied with its methods. In the Anglo-American tradition, the notions such as wilderness, experience of sublime,

solitude, pastoral, and apocalypse have been central for the scholars analysing such texts (Garrard, 2009). One of the distinctive traits of the Estonian tradition of nature writing is a strong scientific background of its authors (Tüür & Maran, 2005). Scientific names, data, and explanations are routinely provided as comments to the immediate observations of natural phenomena. At the same time, such texts cannot be approached as academic papers as the writer's subjective persona is ever present in them. The solution we are offering in the present article is to consider such texts as nature writing. The dynamic model of nature writing is introduced and applied, demonstrating some possibilities of ecocritical analysis.

MATERIAL AND METHODS

Source material

The source material for the present study is a book based on botanical fieldwork notes that resembles a diary rather than a research text.

The author Haide-Ene Rebassoo (b. 1935) is an Estonian botanist who has published extensively on Estonian plants, plant communities, their distribution and protection; she has written chapters for encyclopaedic collections and accounts of plants for a wider public (for her bibliography, see Kukk, 1999). The present article focuses on her book titled *Botaanilisi kilde 17 Hiiumaa suvest* [Botanical Fragments from 17 Summers in Hiiumaa] (further referred to as BF), published in 1975. Unlike the majority of the books issued during the Soviet period, this one does not have an annotation on its impressum page. It is merely indicated that 10 000 copies of the book were printed. No reviews of the book appeared in periodicals.

As the title of the book suggests, flora and botanical knowledge are the focus of the text. The time span specified in the title is 17 summers. Each year's accounts are limited to summer, or at least to the vegetation period, as this is the most suitable time for botanical explorations. The setting is specified as the island of Hiiumaa, North-West Estonia. At the beginning of the book, a hand-drawn map of Hiiumaa is presented (Fig. 1), showing the natural features of the island (rivers, swamps, islets) and the approximate locations of the settlements mentioned in the text. The elements of the natural environment are brought to the fore; no roads are marked on the map.

BF has three inserted sections of black and white plant photographs, each section containing 41 to 44 photos, 129 in total. The lyrical captions accompanying the relatively high-quality illustrations indicate that their intended function was not only documenting the plants, but also conveying the beauty of the nature. Fieldwork notebooks served as the main source material for the text. The composition as well as the contents of the book were prepared and proposed to the publisher by the author herself. No major alterations were made in the manuscript during the editing process (Mall Johanson, editor of BF, pers. comm. 02.11.2010).

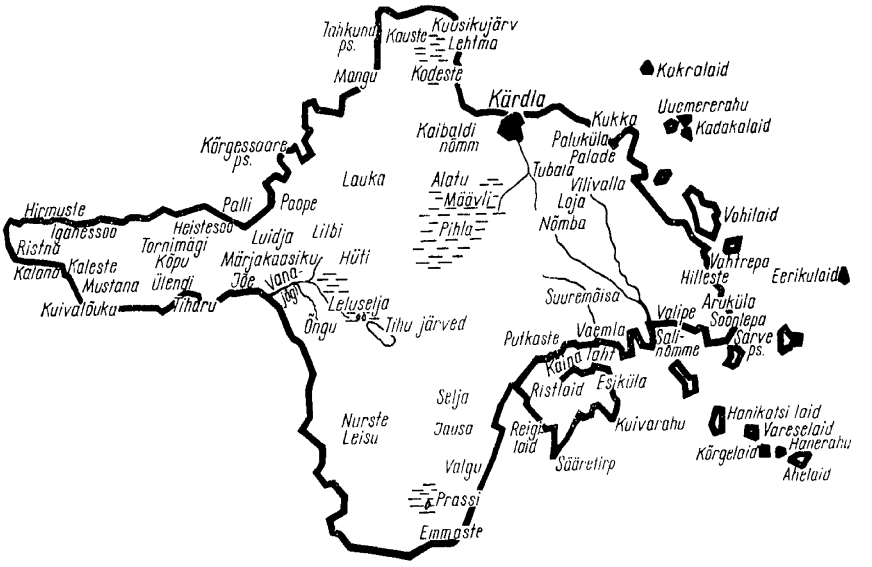

Fig. 1. The map of Hiiumaa from Rebassoo, 1975.

For the most part, the text describes encounters with various plants of Hiiumaa, both ordinary and rare, whether rare because of numbers or a specific quality. Contacts with local cultural history and local community are scarcely referred to. However, the book contains a social dimension in the sense that it carries and forwards the pathos of nature conservation of its time. All these aspects of the book will be discussed in more detail, drawing methodological support from an ecocritical approach, set against scientific (botanical) background.

Methods

In the present article, we examine BF as nature writing, which is a concept stemming from ecocriticism and developed further in concordance with the ecosemiotic approach. Ecocriticism is quite simply explained as 'the study of the relationship between literature and the physical environment' (Glotfelty & Fromm, 1996). *The ISLE reader*, a more recent anthology surveying the development of ecocritical thought up to the 21st century, explains ecocriticism as 'concerned with the environmental implications of literary texts' (Branch & Slovic, 2003), suggesting that any literary work can be read from the 'green' perspective and that analytical frameworks developed in other disciplines can be incorporated into an ecocritical reading.

Ecosemiotics is a recent development in the study of semiotic relations between human culture and living nature (Nöth, 1996; Kull, 1998). It studies the meaning

processes involved in nature experience (Maran, 2010). Combination of ecocritical methods with ecosemiotic ones enables to generalize the models formed on the basis of empirical study of nature writing.

Nature writing has formed the cornerstone and primary source material for ecocriticism since its establishment as a distinctive field of literary study. The texts considered as nature writing are first-person narrative essays (i.e. non-fiction) that, 'while scientifically informed, are also marked by a personal voice and a concern for literary values' (Finch & Elder, 2002). The texts of nature writing, unlike fiction, are not an end in themselves, but serve as means for persuading the reader to visit the same places and see the same species, in order to gain real-life experience similar to that of the author of the text.

Dynamic model of nature writing

Nature writing as a certain type of literary text mediates nature and culture, bringing the processes in nature into the realm of human written culture. In nature writing, the culture–nature interaction is modelled, and its analysis can reveal certain ideological aspects of their cultural context. Nature writing provides invaluable examples of how we grasp, understand, and interpret nature by means unique to human species, i.e. by highly abstract language.

Drawing from the definitions and descriptions provided in ecocriticism (Buell, 1995; Lyon, 1996; Finch & Elder, 2002), three major dimensions define a text as 'nature writing':

(1) The text is based on immediate, scientifically apt observation of some particular location, species, or process in nature.
(2) The experience is formulated as an essayistic text, created with an artistic ambition; often aesthetic aspects of nature are foregrounded.
(3) The pragmatic aims of nature writing are to evoke interest towards nature in the reader and to encourage establishing immediate connections with nature, therefore such texts contain direct references to the objects outside textual reality (i.e. in the natural world).

The first dimension can be associated with the tradition of scientific writing, and its particular manifestations include, for example, indications of exact dates, locations, scientific names of species, and other scientific data. The second dimension is related to belletristic writing, e.g. bringing along autobiographical elements, metaphorical expression, abundance of epithets, and intertextual references that would commonly be avoided in a scientific paper. The third dimension is related to texts as pragmatic commodities or aids for achieving some practical goal such as sharing information on the practical usage of natural objects, instructions on travel routes, wild animal behaviour, maps, photos, and schemes.

The three-fold influences from the described textual fields can be depicted as overlapping circles (Fig. 2). According to this schema, nature writing is formed in the intersection of three marginally overlapping types of texts: scientific texts, belletristic texts, and pragmatic texts (Tüür, 2007).

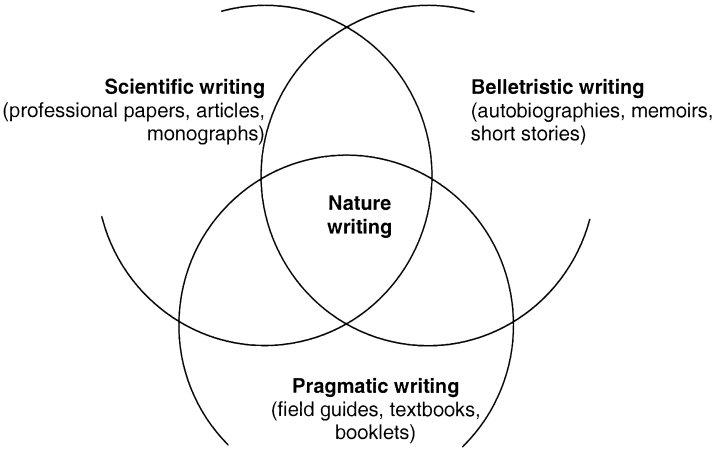

Fig. 2. A dynamic model of nature writing. The three general component fields and the overlapping area on their margins, which constitute the realm of nature writing.

BF AS NATURE WRITING

According to the model of nature writing, a text conforming to such a definition combines aspects of three types of texts, namely, scientific, belletristic, and pragmatic texts. In the following discussion, BR is examined to determine the extent to which it displays each of these characteristics.

Scientific dimension

The first, scientific dimension of nature writing is most obvious in BF, as the subject matter of the book is plants, regarded from a botanical-scientific viewpoint. Other topics are rarely touched upon. Chronological analysis reveals that the author's activities beyond professional scope have probably even been systematically omitted from the book. In some instances, an observation of birds is recorded, but they appear as a function of the plants, namely, as their travelling vehicles. Therefore it is an exceptionally focused piece of nature writing. Setting such a scope for a book has both advantages and disadvantages, as it requires at least some botanical competence (or, some shared passion) from the reader. The aim of an environmental 'thick description', according to Buell (1995), is to give proof of the quality of nature writing to render more nuances in the environment than the reader alone would be able to notice. The detailed attention may be selective, though, and this appears to be quite true in the case of BF.

The author does not restrict herself to only botanical nomenclature – she sometimes tacks adjectives onto some of the plant names, making it difficult for the average reader to distinguish her words from the scientific name. Such 'special'

plants include, for example, poisonous (adjective) *Daphne mezereum*, tender (adjective) *Carex limosa*, pink-blossomed (adjective) *Glaux maritima*, and *Astralus danicus* – a legume with tight purplish blue inflorescences.

The author's focus throughout the book is on single species rather than plant communities. In some cases, a strong inclination to typologization occurs. Towards the beginning of the book, plants are presented in extensive lists, containing up to 20 plant names in one sentence (see, for example, BF: 34). As the flora becomes more familiar to the writer over the summers, lists are gradually replaced by longer descriptions of individual species. In the plant descriptions, strictly scientific vocabulary is used (e.g. spikelet, nut, stipules, whorl, obovate capsule, halophilous, opposite epetiolate ovate leaves, etc.). As a rule, information about the geographical distribution of the species is provided.

The collection and observation of rarities seem to be among Rebassoo's favourite botanical activities. Such interest has strong nature protectionist implications. The monitoring of rare species in Hiiumaa is carried out with consistency during the years described in BF. Rebassoo searches for and pays repeated visits to Hiiumaa's ivy specimens and yew grooves. In the text she compares the vegetation parameters and follows what could be termed 'the time of plants' – the sprouting, vegetation growth dynamics, and disappearance of certain specimens over time. She is fully aware that a plant's time scale differs from that of the humans and only long-term observation allows us to understand vegetation dynamics.

In her PhD thesis completed parallel to making field notes for BF, Rebassoo states, 'The fieldwork methodology has predominantly relied on excursions. The routes were chosen randomly during the first years (1956–1958); later (1959–1965) the routes were chosen so that finding places of certain plant species were (re-)visited; also the questions concerning the genesis of flora and other plant geographical issues were studied by examining a certain limited territory' (Rebassoo, 1967). Random hikes were gradually replaced by repeated visits to certain locations and observations of particular plant specimens, especially the rare ones.

It is especially interesting to observe how the author's scientific nature conservationist ideas explicitly relate the text with the broader social context of its time, and also guide the author's understanding of particular landscapes. The end of the 1950s was the time of re-establishing state-organized nature protection in Estonia (Eilart, 1976). Parallel to her scientific fieldwork, Rebassoo was actively engaged in these activities, helping to find, describe, and evaluate the objects that would be worth protection. Her approach is very much object-, not process-centred, illustrating well the understanding of the notion of 'protection' of that time. In some other writings, she expresses a somewhat wider understanding of nature protection. In an article about nature protection on small islets (Rebassoo, 1975b), she starts out with an extensive list of plants that need protection as relics or species growing at their distributional border, but concludes that plants must always be protected together with their habitat. For this purpose, she suggests that small islets should be taken under protection in their entirety. Although she provides a schema on the natural as well as anthropogenic factors influencing the

development of flora on small islets in the article, her protection proposal does not include any human intervention.

In the semi-natural communities Rebassoo tends to reconstruct an earlier community type of broad-leaved forest in her text, assigning it higher conservation value over the wooded meadows and pasturelands. She regards the extensive herding of cows on the fragile coastal plant ecosystems as a major threat. It is highly probable that over-grazing was a problem on some of the coastal meadows and islet pasturelands in the 1960s–1970s, as Rebassoo eloquently describes in BF, but the importance of grazing for maintaining open landscapes must not be underestimated. Thus, her pathos is in sharp contrast with the contemporary understanding of the semi-natural communities as highly valuable and of the herding as the key component of nature conservation (see Lotman & Lepik, 2004).

In Rebassoo's writings, a more general trend in Estonian nature conservationist ideas becomes visible: a gradual shift from the idea of protecting single objects or (rare) specimens to the protection of habitats. In that regard, BF is an important document about the development of the nature conservationist ideas in Estonia, as Rebassoo expresses them in her text as personally comprehended and emotionally relevant part of one's experience of nature.

Belletristic dimension

The author's voice in the text, expressing her personal ideas and occasionally wording the positive emotions associated with fieldwork, grows stronger as time goes by. Personal contact with the environment and metaphorical usage of words characterize this dimension.

The emotional epithets attached to the described species show the author's attitude to the plant. In addition to the epithets, the author's emotional attitude towards the flora is conveyed in a less subtle way in numerous interjections in the text, such as 'Surprise!' (BF: 69, 80, 81), 'It can not be!' (BF: 77), and 'What a botanical sensation!' (BF: 102). These allude to the author's strong wish to share her joy about the encounters with plants with her reader not only on the referential, but also on the emotional level. This indeed is something that would be left out of scientific research papers, but nature writing, as well as unpublished field notes, allow a scientist to express her feelings in a less restricted way, thus giving a more personal taint to the predominantly scientific activities.

The young and enthusiastic student of botany depicts herself within the text: 'Carrying a backpack and a plant frame I step into a local bus that takes me to the places where I wish to go. I am off to a two months long botanical practicum in Hiiumaa, with the goals of getting thoroughly acquainted with the flora of Hiiumaa, collecting its samples, and gathering material for my BSc thesis.' (BF: 9). Further in the text, she describes measuring distances with steps, using a compass, crossing various types of landscape while following direct transect lines on a diverse landscape, revealing her immediate, bodily presence in the natural environment. The author makes remarks about her wet feet, scratching shrubs,

sinking silt, beaming sun; she also recalls her mouth-watering encounters with Hiiumaa's wild berries, and occasionally gladly notes the absence of mosquitoes. The reader can have no doubt that the author is present in the landscape with all of her senses. This is indeed a dimension that is omitted in scientific papers, but the one that makes the activities of a botanist closer to an average reader.

The usage of the verb 'travel' develops into a wider metaphor in the text. The image of travelling plants is made literally pictorial in the following passage: 'An ancient road from Sarve to Heltermaa harbour passes this site. It must be that *Anagallis arvensis* has grabbed from the horse-drawn cart with all its teeth and claws, and travelled from Sarve to the coast of the sea this way' (BF: 42). Another means of fast transportation for plant seeds, also referred to as 'travelling' in BF, is the flocks of birds of passage that carry various edible plant seeds onto the sea shore and distant small islets in the sea in their bellies.

The metaphor of travelling suits well Rebassoo's own dynamics of activities. She is always on the move, ruthlessly passing difficult landscapes, searching for plants to be monitored, hiking from one fieldwork site to another. Only towards the very end of the book a couple of passages are given when she 'steals the moment', lying down on a moss-covered stone in the middle of a forest, or stopping to collect and eat strawberries (BF: 100–102, 127–128). Each occasion of peace is followed by a certain shame and a slight regret about the moments that slip away fast. This slower pace indicates the author's growing familiarity with the place. Peculiarly enough, it does not mean familiarity with the people living in the place but with the plants.

The author's persona determines the structure of the book to a great degree – for example, the records and omissions in the chronological line of the diary. The rhapsodic oscillations between places at the beginning of the book calm down towards the end, making the text easier to follow. This dynamics could be explained with the growing familiarity of the author with her fieldwork areas: at the beginning of her trips, she feels like a stranger in Hiiumaa, but as her knowledge of the local flora grows and her movement trajectories get more purpose-driven, she allows for more personal comments. Her confidence as a person grows on a professional as well as on the everyday plane. Thus we can see the experience of place conditioning the personal becoming. Nature shapes the author, as well as the dynamics of the text written about her experience of nature.

Pragmatic dimension

Nature writing often includes educational or practical information that is aimed at fulfilling the readers' practical needs that may possibly arise: how to recognize a place or a species, how to find one's way in the particular natural environment, etc.

In BF, illustrations and diary-like structure of the text support the pragmatic dimension. The map (see Fig. 1) provides a tool for the reader to become oriented in the textualized landscape. The photographs attempt to create an intersemiotic whole with textual and visual components supporting each other in the creation of

a new level of meaning (for an analysis of intersemiosis in nature writing, see Tüür, 2004). It is interesting to note that the majority of the photos are plant close-ups, not general landscape views, and the same tendency is prevailing in the text: the descriptions of nature predominantly concentrate on single plants and their details; landscapes, locations, and trajectories are scarcely described. Two possible explanations could be given for such practice: first, it reflected the author's interest in the micro-level of landscapes (the plants); and second, it was safer not to provide detailed information about roads or give panoramic views of the island landscapes that were considered sensitive military information by the then regime because of the presence of military installations on the island.

The dynamics of the general time scale covered in the book, as well as the chronological line of Rebassoo's visits to Hiiumaa, is rather fragmentary (as already suggested in the title). Most visits during the 17 years described were made in June and the first half of July (Fig. 3). Towards the beginning of the book, the covered time periods are longer and concentrated; then the described time periods shrink to merely a couple of days per year, and towards the end of the book the time span is prolonged to incorporate the months of May and September. Such a timeline suggests concordance with the dynamics of the writer's personal relationships with her study area. During her earlier trips, she is a student with a certain task to be accomplished within a certain time frame. As her emotional contacts with the place grow stronger, she starts to represent only the brightest selected moments of her research activities in her 'plant diary'. Diary form convinces the reader of nature writing of the author's incessant spatial and temporal involvement with the described environment (Slovic, 1996). The author's botanical visits gradually increase in time and decrease in spatial amplitude. The described periods of stay in Hiiumaa are prolonged, whereas the number of different places visited during the described stays decreases. The book provides sufficient

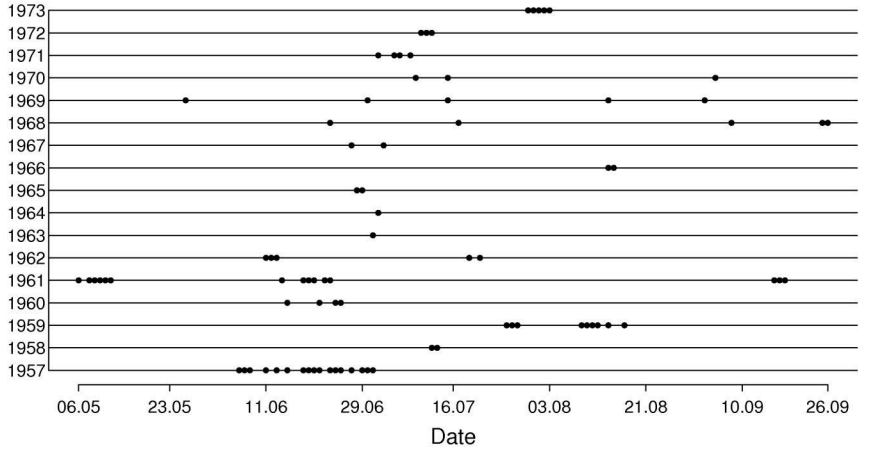

Fig. 3. The timeline in Rebassoo, 1975. Each date featuring an entry in the text is marked with a dot.

information to a reader wishing to follow the footsteps of the author. Much has altered in the plant communities and human communities, as well as in the attitudes and priorities concerning nature protection, but one of the virtues of nature writing is that it is able to demonstrate the historical dimension of natural environments.

CONCLUSION

The theoretical model for analysing nature writing used in the present study was developed mainly in the framework of ecocriticism, the critical study of environment as it appears in written narratives. Nature writing is a type of literature that is formed on the margins of three broader categories of written texts, namely scientific writing, belletristic writing, and pragmatic writing. As such, it has only recently been conceptualized as a distinctive type of texts deserving critical as well as scientific attention. The book *Botaanilisi kilde 17 Hiiumaa suvest* [Botanical Fragments from 17 Summers in Hiiumaa] by Haide-Ene Rebassoo, which has typically been seen as a popular science work, proves to be a productive choice for extracting information about the representation of plants, their study, fieldwork methodology, and the predominant ideas of nature protection of the time period covered in the text. The book provides predominantly scientific information about the vegetation, both typical plants and rarities of Hiiumaa Island, and about the author's research practices during fieldwork. At the same time, emotional epithets, interjections, metaphoric usage of some concepts ('travelling' plants), indication of one's bodily presence, give a strong individual character to the book that likens it to essayistic prose. It is clear that the notes were taken by a writer holding subjective freedom in esteem. Photographs and the map of the island offer the reader practically useful information, but also add to the aesthetic dimension of the book as a whole. The book fits into the three-part dynamic model of nature writing, thus appearing as a proof of the suitability of the model and of the relevance of an ecocritical approach to this type of work.

ACKNOWLEDGEMENTS

The article was written with support from the Estonian Science Foundation (grant No. 7790 to Kadri Tüür). The research was supported by the European Union through the European Regional Development Fund (Centre of Excellence CECT).

REFERENCES

Branch, M. & Slovic, S. (eds). 2003. *The ISLE Reader: Ecocriticism, 1993–2003*. University of Georgia Press, Athens and London.

Buell, L. 1995. *The Environmental Imagination. Thoreau, Nature Writing and the Formation of American Culture*. The Belknap Press of Harvard University Press, Cambridge and London.

Eilart, J. 1976. *Inimene, ökosüsteem ja kultuur. Peatükke looduskaitsest Eestis*. Perioodika, Tallinn.
Finch, R. & Elder, J. 2002. *Nature Writing. The Tradition in English*. W. W. Norton & Company, New York and London.
Garrard, G. 2009. *Ecocriticism*. Routledge, London and New York.
Glotfelty, C. & Fromm, H. (eds). 1996. *The Ecocriticism Reader: Landmarks in Literary Ecology*. University of Georgia Press, Athens and London.
Kukk, T. 1999. *Eesti taimestik*. Teaduste Akadeemia Kirjastus, Tallinn.
Kull, K. 1998. Semiotic ecology: different natures in the semiosphere. *Sign Systems Studies*, **26**, 344–371.
Lotman, K. & Lepik, I. 2004. Coastal meadow as a habitat. In *Coastal Meadow Management. Best Practice Guidelines*, pp. 8–25. Ministry of the Environment of the Republic of Estonia, Tallinn.
Love, G. A. 2003. *Practical Ecocriticism: Literature, Biology, and the Environment*. University of Virginia Press, Charlottesville, Virginia.
Lyon, T. 1996. A taxonomy of nature writing. In *The Ecocriticism Reader: Landmarks in Literary Ecology* (Glotfelty, C. & Fromm, H., eds), pp. 276–281. University of Georgia Press, Athens and London.
Maran, T. 2010. An ecosemiotic approach to nature writing. *PAN: Philosophy, Activism, Nature*, **7**, 79–87.
Murphy, P. D. 2009. *Ecocritical Explorations in Literary and Cultural Studies*. Lexington Books/ Rowman and Littlefield, Lanham.
Nöth, W. 1996. Ökosemiotik. *Zeitschrift für Semiotik*, **18**, 7–18.
Rebassoo, H.-E. 1967. *Hiiumaa floora ja selle genees*. Valgus, Tallinn.
Rebassoo, H.-E. 1975a. *Botaanilisi kilde 17 Hiiumaa suvest*. Valgus, Tallinn.
Rebassoo, H.-E. 1975b. Botaaniliste objektide looduskaitsest Eesti väikestel meresaartel. In *Eesti loodusharulduste kaitseks* (Kumari, E., ed.), pp. 104–113. Valgus, Tallinn.
Slovic, S. 1996. Nature writing and environmental psychology: the interiority of outdoor experience. In *The Ecocriticism Reader: Landmarks in Literary Ecology* (Glotfelty, C. & Fromm, H., eds), pp. 351–370. University of Georgia Press, Athens and London.
Tüür, K. 2004. Nature writing and intersemiosis. In *Intertextuality and Intersemiosis* (Grishakova, M. & Lehtimäki, M., eds), pp. 151–167. Tartu Ülikooli Kirjastus, Tartu.
Tüür, K. 2007. Looduskirjanduse määratlus. *Acta Semiotica Estica IV*, 73–96.
Tüür, K. & Maran, T. 2005. Eesti looduskirjanduse lugu. In *Eesti Looduskultuur* (Maran, T. & Tüür, K., eds), pp. 237–270. Eesti Kirjandusmuuseum, Tartu.

Botaaniline looduskirjandus: kirjandusökoloogiline analüüs

Kadri Tüür ja Triin Reitalu

Artiklis on esitatud kirjandusökoloogiline analüüs looduskirjanduse traditsiooni kuuluva Haide-Ene Rebassoo teose "Botaanilisi kilde 17 Hiiumaa suvest" näitel. Looduskirjanduse dünaamilist mudelit on rakendatud kirjandusökoloogilise metodoloogia edasiarendamiseks, aga ka kirjandusökoloogilise lähenemise sobivuse näitamiseks varem alamõtestatud looduskirjandusteoste uurimisel. Analüüsi tulemusena saab järeldada, et allikmaterjal sisaldab nii teaduslikku, ilukirjanduslikku kui ka tarbelist mõõdet; rõhk on taimeteaduslikul teadmisel.

APPENDIX 1. ANNOTATED BIBLIOGRAPHY

Annotated bibliography of the books of nature writing used in the scholarly articles included in the present thesis, in chronological sequence.

Spuhl-Rotalia, Jaan 1896. *Kodumaa kalad: Eesti-, Liiwi- ja Kuuramaa wetes ning Läänemeres elutsevate kalade looduslugu, nende püüdmine kunstliste abinõuudega, kaswatamine, kunstlik sugutamine ja kalatiikide asutamine* [Fishes of Homeland: natural history of the fishes inhabiting the waters of Estonia, Livonia and Curonia and in the Baltic Sea, their catching, hatching, breeding and instructions on establishing fish ponds]. Viljandi: A. Peet.
Jaan Spuhl, pseodonym Rotalia (1859–1916) was a pedagogue and garderner, and a pioneer of Estonian-language nature writing, with an emphasis on instructive texts (entering the field from the direction of commodity texts). He established orchards on Vormsi island and in Haapsalu town, and issued the magazine "Majapidaja" (*Housekeeper*) in early 20th century. His book on fishes of homeland is the first Estonian language field guide to fish. It includes culinary suggestions alongside identification cues for each species, as well as cultural information regarding the behaviour of fish and human–fish interactions.

Aho, Juhani 1921. *Lohilastuja ja kalakaskuja* [Salmon stories and fishing anecdotes]. Porvoo: Werner Söderström.
Juhani Aho, citizen name until 1907 Johannes Brofeldt (1861–1921) was an important Finnish national writer, most known for his realist novels, psychological stories, and impressionist nature miniatures. He was the first professional writer in Finland. His collection of fishing anecdotes is a series of personal essays about the passion and about the tension that lure one to fly-fishing. His nature representations echo the author's national romanticist affection for homeland. Aho was an avid fisherman throughout his life, and he initiated the protection of Huopanankoski rapids for the purpose of recreational fishing.

Tammlaan, Evald 1932. *Jänkimehe heeringakirjad* [Yankee Man's herring letters]. Tallinn: Eesti Päevaleht.
Evald Tammlaan, citizen name until 1936 Stein, pseudonym Jänkimees (1904–1945) was a journalist, maritime writer, and playwright. He participated in a number of ocean voyages on sailing yachts, cargo vessels, and herring fishing ships. Based on these trips, he published extensive sequel feature stories in daily newspapers. His writings are characterised by eloquent style and strong compassion to the blue-collar workers at seas. His nature observations are vivid and written in a suggestive manner. "Herring letters" is a rare document casting light to the everyday life of the Atlantic herring fishers of Estonian origin in the 1930s. He died at a concentration camp during WW II.

Toom, Alma 1932. *Vilsandi linnuriik* [Vilsandi bird kingdom]. Tartu: Loodus.
Alma Toom, also spelled Thom (1903–1944 or 1945) was a schoolteacher on Vilsandi islet, and the spouse of the overseer of the Vilsandi bird protection area, Artur Toom. She wrote her only published book, "Vilsandi bird kingdom", based on her husband's oral stories narrated to the visitors of the bird islets. Publishing of the book was supported by outstanding Estonian naturalists who at that time worked at University of Tartu Kuusnõmme biology station – Johannes Piiper, Johannes Käis, Henrik Koppel.

The book gives an overviw of the cultural history and the natural history of the inhabitants of Vilsandi and the surrounding islets, with the emphasis on several species of waterfowl and observations of their behaviour. It is one of the finest pieces of Estonian nature writing from the first half of the 20th century, and the only one written by a woman author from that period. During WW II she was deported to detention in Nagorsk, Kirov oblast, Russia. The exact place and time of her death remain unknown.

Zedtwitz, Franz Xaver Graf 1933. *Vogelkinder der Vaikariffe* [Birdlings of Vaikas]. Berlin: Scherl.
Franz Xaver Graf Zedtwitz (1906–1942) was a German biologist and nature writer. He wrote several books in German about wild animals and game hunting. According to Artur Toom, he had seen the book by Alma Toom in Berlin, and decided to come and visit the bird islets to write his own book about the same place next year. There are many structural similarities in the books by Toom and Zedtwitz – the temporal disposition, the discussed species and their sequence. The photographs in Zedtwitz's book are taken by the author himself, whereas the illustrations in Toom's book have been taken by photographers Brandt and Ecke. According to Estonian library records it can be deduced that the book was known and read in Estonia, as for historical reasons, German was at that time one of the main languages of education and research here. Zedtwitz was killed during WW II.

Mälk, August 1934. *Jutte lindudest* [Bird stories]. Tallinn: Eesti Õpetajate Liidu noorsookirjanduse toimkond.
August Mälk (1900–1987) was a renown Estonian prose writer. His main works are novels about the life of coastal people. Native of Saaremaa, he often visited Vilsandi, and in 1932 he spent several weeks as a guest of Artur Toom, going to bird observsation trips at Vaika bird islets. As no publishing house was willing to publish the resulting book, it was issued by the author himself. The waterfowl species depicted in "Bird stories" coincide with the ones that were discussed in Toom's and in Zedtwitz's books – quite naturally, as they all carried out their nature observations in the same place and all decicded to focus on the breeding season in their stories. Mälk uses more personification and anthropomorphisation of birds in his book than the other mentioned authors, explaining it with the need to appeal to the readers. In 1938, the book was issued in Swedish translation, and several of its stories have later been included in Estonian literature texbooks for schools.

Kirss, Kaarel, Lilberg, A., Port, Jaan, Tasa, Edur 1934. *Suvine loodus. Loodusloolisi saateaineid algkoolile* [Nature in summer. Reading material for natural history classes in elementary school]. Tartu: Loodus.
The young Republic of Estonia put a strong emphasis on developing school textbooks in Estonian language. This concerned all levels of education – from university textbooks to elementary school readers. "Nature in summer" is an example of this trend. It contains original pieces by renown Estonian authors, such as Henrik Visnapuu, Gustav Suits, Anton Hansen Tammsaare, but also translations of outstanding nature writing in other languages, for example by Ernest Seton-Thompson, Carl Evald, Hermann Wagner, Herman Löns, Jean-Henri Fabre and others. The piece titled "By the river" by Henrik Visnapuu (1889–1951) who is popularly known as a lyrical poet, provides an exceptionally vivid insight into the Umwelt of a roach that is being caught by hook and line. The book as a whole is a valuable historical document of the formation of the tradition of nature writing in Estonian, as well as a good read, also by contemporary standards.

Piiper, Johannes 1935. *Pilte ja hääli kodumaa loodusest* [Pictures and sounds from the nature of homeland]. Tartu: Noor-Eesti.
Johannes Piiper (1882–1973) is the central figure in the history of Estonian nature writing. He graduated as a biologist from the University of St. Petersburg and obtained his doctoral degree in ornithology from University of London. For more than half a century, he worked as a professor of biology in University of Tartu. One of his most remarkable academic publications is "Biological Letters" (1910–1911), the first attempt to explain cell biology and evolutionary biology in Estonian. Parallel to academic work, he was an avid naturalist, led Kuusnõmme field biology station, and initiated founding of Estonian Ornithological Society. His "Pictures and Sounds from the Nature of Homeland" established the tradition of Estonian nature writing and set its standards for a long time. Piiper combines very detailed observations of a field biologist with a strong sense for aesthetic experience and elaborate descriptions. His stories ("pictures") are based on his fieldwork notebooks, where he noted down not only the spotted species, but also the impressions and feelings that accompanied each field trip.

Eerme (Ehrmann), Karl 1935. *Õngelatiga mööda Võrumaad* [Around Võrumaa with a fishing rod]. Võru: Noor-Eesti.
Karl Eerme, citizen name until 1937 Ehrmann (1905–1975) was an Estonian journalist and documentary prose writer; also published poems and plays. His writings focuses on the (stereo)typically male experience of the world. His interest in fishing started as a result of befriending Jaan Vahtra, an artist native of Võrumaa, who also illustrated "Around Võrumaa with fishing rod". The two men also co-operated in publishing a book about Taevaskoda and Valgemetsa, places of remarkable natural beauty in Southern Estonia in 1940. Eerme's publications render stories about popular places for recreation, including recreational fishing, but also about calm fishing nights by remote rivers of Võrumaa.

Vahtra, Jaan 1940. *Metsajärv* [Forest Lake]. Tartu: Noor-Eesti.
Jaan Vahtra (1882–1947) was an artist, nature writer and journalist. He has written extensively about his native Võrumaa in Southern Estonia, mostly in the form of memoirs. "Forest lake", as well as his story "Angling" that was published as a separate book in 1946, is rooted in Vahtra's childhood experiences from growing up in a remote farm in forests. Vahtra's stories demonstrate intimate knowledge of nature, as well as the archaic beliefs and oral lore related to nature. As an artist, he has illustrated numerous books by Estonian literary classics, but also books of nature writing.

Hemingway, Ernest 1952. *Old Man and the Sea*. New York: Scribner.
Ernest Hemingway's (1899–1961) "Old man and the sea" is considered one of the finest pieces the world-renown writer and Nobelist has written. Upon publishing, the book won Pulitzer prize in 1953. The story of an old man's epic fishing trip and his fight with a huge marlin and a band of sharks is perhaps one the most iconic stories on human–fish interactions. In an interview for the Time magazine, he has said: "I tried to make a real old man, a real boy, a real sea and a real fish and real sharks. But if I made them good and true enough they would mean many things."[26] Here, the story has been used as a comparison material for the pieces of Estonian nature writing where human–fish interactions are discussed.

[26] Time no 24, Dec. 13, 1954.

Jüssi, Fred 1966. *Kajakad kutsuvad* [Call of the gulls]. Tallinn: Eesti Raamat.
Jüssi Fred 1986. *Jäälõhkuja* [Wagtail]. Tallinn: Valgus.
Fred Jüssi (1935) is the Grand Old Man of Estonian nature writing and the groundlayer of the contemporary tradition of Estonian nature writing. Besides his work as a naturalist, nature writer and conservationist, Jüssi has worked as a broadcaster of nature programs in Estonian Radio, recorded nature sounds, and issued a number of LPs and CDs with nature sounds with his commentaries. "Call of the gulls" is the first bok of nature writing published by Jüssi, and it was the first one in Estonia to set the tradition of combining text and photographs in representing nature in an artistic manner. Since that time, lyrical texts combined with photographs have been the trademark of Estonian nature writing. The second collection of nature writing by Jüssi, "Wagtail", is central to articles I and III of the present thesis, and a translation of his piece "Sounds" by the author of the present work can be found as an appendix to article I. Jüssi's depiction of our fellow species is always empathetic, full of gentle humour and personal touch, but also precise in regard to biological facts.

Rebassoo, Haide-Ene 1972. *Laidude raamat* [Book of islets]. Tallinn: Valgus.
Rebassoo, Haide-Ene 1975. *Botaanilisi kilde 17 Hiiumaa suvest* [Botanical fragments from 17 summers in Hiiumaa]. Tallinn: Valgus.
Haide-Ene Rebassoo (1935) is the most outstanding Estonian woman nature writer of the second half of the 20th century. Similar to Alma Toom who was the only woman author in nature writing before the WWII, Rebassoo held a similar position during the Soviet time. A botanist by training, her books focus on plants, plant communities, plant dispersal, and the limits of growth of certain plant species. Places of special interest in her writing are islands and islets located at Moonsund archipelago, a relatively shallow marine area by the western coast of Estonia. She also discusses the issues of nature protection in her works. Rebassoo combines the qualities of a deeply engaged scientist and a lyrical observer.

Põldmaa, Kustas 1973. *Koduvetel* [On home waters]. Tallinn: Valgus.
Kustas Põldmaa, citizen name until 1935 Gustav Põldmann (1897–1977) was a life-long schoolteacher and a prolific nature writer whose texts appeared in periodicals and as separate books since 1921. The dominant characteristic of Põldmaa's writing is pedagocical approach. Many of his stories have first been used as instructive reading material for schoolchildren. His stories sometimes slip into sentimentality, but they are invaluable for the ethnographic and folkloristic information they contain. His writing continues the style of the readers for natural history classes in elementary school, where certain biotopes or seasons are explained, species by species, including both biological facts and aesthetic observations.

Jõgisalu, Harri 1974. *Nõiutud allikas* [Enchanted spring]. Tallinn: Eesti Raamat.
Harri Jõgisalu (1922–2014) was a schoolteacher, just as Kustas Põldmaa, and in a similar manner he considered students as his main target group of readers. His nature stories are intertwined with local lore and local history information. He relies on memoirs of elderly folks, and on his own observations that he has collected during his trips to his native Läänemaa and to Estonian small islands and islets in Livonian bay (Kihnu, Sorgu, Manilaid). The wisdom of old people practicing traditional, slow pace, agricultural lifestyle, is admired and explained in Jõgisalu's texts. The sense of wonder towards the minute details of our natural environment combined with clear and lyrical style make Jõgisalu's work an admirable reading for all age groups.

Huovinen, Veikko 1975. *Pylkkäs-Konsta mehtäämässä ja muita erätarinoita* [Konsta Pylkkänen goes hunting and other wilderness stories]. Helsinki: Otava.
Veikko Huovinen (1927–2009) was a Finnish writer renown for his forest stories. A forester by education, he lived at his native Sotkamo and considered himself a mediator between the simple people living and working in the woods, and the upper class, educated people and literati of the cities. "Wilderness stories" collection depicts a man's life in the woods, his activities, thoughts, and aspirations. Though the life circle of the protagonist sticking to his native region may seem limited, the meaningful connections that he manages to create therein, are countless.

Leito, Tiit Leito 1984. *Aastaring laidudel* [A year on the islets]. Tallinn: Valgus.
Tiit Leito (1949) is an Estonian ornithologist, nature conservationist, and a long-time island warden at the islets of the Moonsund archipelago near Hiiumaa island. An avid photographer, he has compiled a number of nature photography books, where the photographs are accompanied with his own texts or, in some cases, texts by other authors, such as Tõnu Õnnepalu. The tradition of text-and-photo books was started in Estonian nature writing by Fred Jüssi; the first to combine nature photography with texts by other authors was Edgar Kask (1930) in his book "Värviliste liblikate lend" [The flight of colourful butteflies] in 1978.[27] In his islet book of nature writing Leito describes the nature on the islets, as well as the sea around them, following the seasonal cycle of the year.

Lepasaar, Juhan 1989. *Laaneteedel* [On the forest roads]. Tallinn: Valgus.
Juhan Lepasaar (1921) is a native of Alutaguse woods. WW II abrupted his education and he had to serve a sentence of seven years in a Siberian copper mine during Stalinist repressions. The forests of his native region have been his home, workplace, and a source of inspiration for nature writing. His forest stories that have been published in several collections, including "On the forest roads", exhibit a deep knowledge of forests, marshlands, and wild animals, but also of the remote forest villages and the world view of their inhabitants. His stories are a rare and beautiful document of the vanishing life in remote forest areas.

Õnnepalu, Tõnu 2015. *Lõpetuse ingel. Märkmeid sügissaarelt* [Angel of conclusion. Notes from an autumn island]. Tallinn: Kultuurileht.
Tõnu Õnnepalu (1962) is an internationally renown Estonian writer, one of our most widely known and translated contemporary prosaists. A botanist by training, he has worked as a teacher on Hiiumaa island before becoming a professional writer. In addition to poetry and fiction, he has published essays and columns, and many of his books bear an autobiographical mark. Life in Hiiuma, inhabiting old coastal houses and walking on the seashore are recurrent themes in Õnnepalu's texts. "Angel of conclusion", however, is set in Vilsandi islet where the author spent some weeks during the autumn bird migration season. Besides the writer's thoughts about theatre and literature, environment, birds, and the geography of the islet form the backbone of the essay.

[27] See Timo Maran's detailed discussion of the writings of Edgar Kask in article II.

APPENDIX 2. BOOK EXHIBITION MATERIALS

Materials of the book exhibition "Framing nature: The story of Estonian nature writing" in Tartu University Library, during the EASLCE biennial conference „Framing Nature: Signs, Stories, and Ecologies of Meaning", April 29–May 3, 2014.

Exhibition texts

Looduse piiritlemine: eesti looduskirjanduse lugu

Käesolev näitus pealkirjaga "Looduse piiritlemine: eesti looduskirjanduse lugu" esitab läbilõike eesti looduskirjanduse iseloomulikumatest suundadest. Eestikeelse loodusesseistika algus ulatub 150 aasta taha, kuid siin näitusel on väljas valdavalt 20. sajandi teisel poolel ja 21. sajandil ilmunud teosed, nende hulgas ka mitmeid varasemal ajal ilmunud raamatute uustrükke. Lisaks algupäranditele on näitusele valitud ka olulisemaid tõlketeoseid, mille ilmumine on eesti loodusmõtet mõjutanud ja looduskirjanduse viljelejaid innustanud.

Näituse juhatavad sisse pildialbumid ja reisikirjeldused. Seejärel tuleb valik kirjandust lindude teemal, aga ka veekogude, vee-elustiku ja putukate kohta. Üks vitriin on tervenisti loomalugude päralt. Eesti looduskirjanduse tuumala moodustavad ökosüsteemi-kesksed tekstid, mille autorid – Johannes Piiper, Fred Jüssi, Rein Kuresoo ja teised – väljendavad selgesti ka oma eetilisi ja esteetilisi hoiakuid. Näituse lõpetab valik algupärast ja tõlkekirjandust looduse ja kultuuri vastastikuste seoste teemal.

Looduskirjanduse üks funktsioone, mille poolest ta ilukirjandusest erineb, on suunata lugeja tekstist läbi, sellessesamasse looduskeskkonda, millest lood räägivad. Loodame, et siin näitusel kohtute nii ammust ajast tuttavate teostega kui avastate enda jaoks uusi raamatuid, mille kaudu minna ja avastada ka uusi paiku ja liike Eestimaa looduses.

Näituse koostas: Kadri Tüür

Abiks olid: Kadi Kass, Ave Pino, Aliine Matisen, Eve Valper, Ilona Smuškina ja Toomas Pruus

Framing nature: the story of Estonian nature writing

This exhibition, titled 'Framing nature: the story of Estonian nature writing' presents a cross-section of the more characteristic trends in Estonian nature writing. The tradition of Estonian nature writing dates back to 150 years ago. This exhibition, however, presents mostly works published in the latter half of the 20th and early 21st century, including recent reissues of books published earlier. In addition to original works, the exhibition also presents significant translated works the publication of which has influenced ecological thought and inspired ecological writers in Estonia.

The exhibition begins with picture albums and travel writings, followed by a selection of literature on birds, bodies of water, underwater life, and insects. One display case is entirely dedicated to animal stories. The core of Estonian nature writing comprises of texts centred on ecosystems, the authors of which – Johannes Piiper, Fred Jüssi, Rein Kuresoo and others – clearly express their ethical and aesthetic attitudes. The exhibition closes with a selection of original and translated works on the theme of mutual relations between nature and culture.

One of the functions of nature writing that distinguishes it from literary fiction is to guide the reader through the text into that natural environment that the stories tell about. We hope that in this exhibition you meet works that are both long familiar, and also

discover for yourself new books through which to go and discover new places and species in Estonian nature.
The exhibition was compiled by Kadri Tüür, with the help of Kadi Kass, Ave Pino, Aliine Matisen, Eve Valper, Ilona Smuškina, and Toomas Pruus.
Texts translated by Silver Rattasepp

I Kaunis Eesti
Kõige silmapaistvama osa eesti looduskirjandusest moodustavad kaasajal loodusfoto-albumid, kus loodusesseistika on saateks pildile püütud loodushetkedele – või vastupidi, kuidas just ühegi autori rõhuasetused on seatud. Tiit Leito on oma loodusfotode juurde laenanud tekste Tõnu Õnnepalult. Viimane on rahvusvaheliselt tuntud kirjanik, hariduselt aga hoopis bioloog. Fred Jüssi Ajamustrite raamat viib meid tühjaks jäänud metsatalude ja seal leiduvate puuesemete juurde. Kas tunnete ära, mis on pildil?

Looduskirjanduse üheks oluliseks ülesandeks selle alguseaegadest peale on olnud ärgitada inimestes huvi ja armastust oma kodumaa looduse vastu. Esimese eestikeelse matkakirjelduse avaldas tuntud luuletaja Villem Ridala 1921. aastal – Soomes õppinuna oli ta skandinaavialiku matkakultuuri üheks "maaletoojaks" Eestisse. Matkamist propageeris oma teostes ka pedagoog ja lastekirjanik Jüri Parijõgi. Tänapäeva retkekirjeldused on enamasti seotud maastikku rajatud matkataristuga (matkarajad, linnutornid) või tutvustavad mõne professionaalse retkejuhi lemmikmarsruute. Eesti juhtiv majandusleht "Äripäev" on andnud välja matkaraamatu, kus muuhulgas soovitatakse oma võõramaalastest äripartnerid rabamatkale viia, et nendega seal sundimatus õhkkonnas koostööplaane pidada.

Beautiful Estonia
The most notable part of Estonian nature writing today consists of nature photo albums, in which the essays complement the photographed moments of nature – or vice versa, depending on the personal emphasis of the various authors. Tiit Leito has borrowed texts by Tõnu Õnnepalu to accompany his nature photography. The latter is an internationally renowned author, but a biologist by education. Fred Jüssi's book on temporal patterns takes us to empty forest farmsteads and the wooden items found within. Do you recognize what the image depicts?

Ever since its first appearance, one of the more important tasks of nature writing has been to encourage interest and love in people towards their homeland's nature. The first Estonian hiking description was published by the famed poet Villem Ridala in 1921 – having studied in Finland, he introduced the Scandinavian hiking culture to Estonia. Hiking was also advocated for by the educator and children's literature writer Jüri Parijõgi. Today's descriptions of travels are usually connected to hiking infrastructure built into the landscape (hike trails, bird watching towers) or acquaint readers with the favourite routes of a professional hiking guide. The leading economic newspaper "Äripäev" has published a hiking book, which among other things recommends one to take foreign business partners to a bog trip, in order to discuss cooperation in a more informal environment.

II Õhus ja vees
Eestis on väga tugev ornitoloogilise looduskirjanduse traditsioon. Üheks põhjuseks on kindlasti siinsed head linnualad, eriti Matsalu looduskaitseala ning Vilsandi ja Vaika saared Lääne-Eestis, mida on sõnas ja pildis tutvustanud teiste hulgas Fred Jüssi, Alma Thom (meie esimene nais-looduskirjanik), August Mälk, Erik Kumari.

Oma ornitoloogilise fookusega autobiograafilises teoses “Lindude laht” avaldas Eesti 20. sajandi silmapaistvaim linnuteadlane Erik Kumari muuhulgas loo “Minu sõber veetallaja”, mis loob otsese seose Rootsi ornitoloogi, esseisti ja loodusfilmimeistri Bengt Bergi tuntud looga “Minu sõber roostepugu-tüll”. Linnutundmise kultuuri edendvad ka raamat lindudest rahvapärimuses ning linnuhäälte CD-ga varustatud “Linnuaabits”. Mitmeid eesti looduskirjanikke on inspireerinud 1923. aastal vene keelest eesti keelde tõlgitud linnuraamat Peterburi õpetlase Dmitri Kaigorodovi sulest.

1930. aastatel ilmus mitmeid värviliste pilditahvlitega suureformaadilisi trükiseid sarjas “Ilu kunstis ja looduses”. Tänapäeval on akvarellid asendunud objektiividega. Eestis on putukate pildistamisele spetsialiseerunud doktorikraadiga entomoloog, tegevteadlane Urmas Tartes.

Siseveekogude, sealhulgas allikate kaitse alla võtmist propageeris 1930. aastail esimese Eesti looduskaitseinspektorina teotsenud Gustav Vilbaste. Tema lapselaps kirjutas allikate kultuuriloolisest tähendusest raamatu. Siseveekogudest kalastaja ning naturalisti pilgu läbi on kirjutanud pedagoog Kustas Põldmaa ja ajakirjanik Karl Eerme. Viimase raamatu illustreeris tema alaline kalapüügikaaslane, kunstnik Jaan Vahtra.

In the air, on the water

Estonia has a very strong tradition of ornithological nature writing. One of the reasons for this is undoubtedly the good local bird areas, especially the Matsalu nature reserve as well as Vilsandi and Vaika islands in Western Estonia, which have been rendered in both words and pictures by Fred Jüssi, Alma Thom (our first woman nature writer), August Mälk, Erik Kumari, and others.

In his autobiographical book with an ornithological focus, “Bay of Birds”, the most prominent Estonian ornithologist of the 20th century, Erik Kumari published the story “My friend the red-necked phalarope”, which creates a direct connection with the Swedish ornithologist, essayist and master of nature film, Bengt Berg’s well-known story “My friend the dotterel”. The culture of bird knowledge is also advanced by the book on birds in folk tradition and the “Bird Primer” that comes with a CD of bird vocalisations. Many Estonian nature writers have been inspired by the 1923 translation of a Russian book on birds penned by the scholar from St. Petersburg, Dmitri Kaigorodov.

The 1930s saw the publication of several large-format books printed in colour in the series “Beauty in art and nature”. Today, cameras have replaced watercolours. In Estonia, the entomologist Urmas Tartes specialises in photographing insects.

The preservation of inland bodies of water, including springs, was advocated for during the 1930s by Gustav Vilbaste, the very first Estonian nature protection inspector. His grandchild wrote a book on the significance of springs for cultural history. The educator Kustas Põldmaa and the journalist Karl Eerme have written on inland bodies of water through the eyes of a fisherman and naturalist. The last book was illustrated by Eerme’s permanent fishing companion, the artist Jaan Vahtra.

III Karismaatiline megafauna

Loomalood paeluvad nii lapsi kui täiskasvanuid. Peeter Ernitsa lood igapäevaselt meie kõrval elavate loomade igapäevatoimetustest on esmalt avaldatud erinevates Eesti päevalehtedes. Loomad on osa meie koduümbrusest, seega ka koduloost, nagu näitavad oma raamatuis pedagoog Harri Jõgisalu ja metsamees Lembit Tihkan. Nii on iseenesestmõistetav, et inimesed võiksid tunda ka loomade poolt maha jäetud kirju – jälgi ja tegutsemismärke.

Lemmikliikideks on – tõenäoliselt ka välismaiste eeskujude, nagu Hermann Lönsi, Ernest Seton-Thompsoni ja Jack Londoni teoste tõlgete toel – hundid ja rebased, aga ka kohalikud siilid, saarmad, mägrad ja ilvesed; koduloomadest konkurentsitult koerad. Loomalugusid on kirjutanud eesti kirjandusklassikud Jaan Kaplinski, Aadu Hint, Friedebert Tuglas, Karl Ristikivi ja Anton Hansen Tammsaare. Viimane on tõlkinud eesti keelde ka kaheosalise koguteose "Looduse imed". Jack Londoni "Valgekihva" illustratsioonide autoriks on üks eesti 20. sajandi parimaid graafikuid, Günther Reindorff.

Charismatic megafauna

Animal stories fascinate both children and adults. Peeter Ernits's stories about the everyday activities of animals who live daily next to us were first published in various Estonian dailies. Animals are part of our home environment, and as such are part of local history, as shown in the books by the educator Harri Jõgisalu and the forester Lembit Tihkan. As such, it is natural that people should also be aware of the inscriptions – footprints and signs of activity – left by various animals.

The favourite species are – possibly because of the influence of translations of works by such writers as Hermann Löns, Ernest Seton-Thompson and Jack London – wolves and foxes, but also local hedgehogs, otters, badgers and lynxes; among domestic animals, dogs are unrivalled. Animal stories have been written by canonical Estonian writers such as Jaan Kaplinski, Aadu Hint, Friedebert Tuglas, Karl Ristikivi and Anton Hansen Tammsaare. The latter has also translated into Estonian the two-part anthology "Wonders of nature". The author of the illustrations to Jack London's "White Fang" is one of Estonia's best graphic artists of the 20th century, Günther Reindorff.

IV: Loodus on lähedal

Üksikute liikide kooselus kujunevad ökosüsteemid, mille toimimise loogikat seletab meie looduskirjanduse tuumala. Eesti looduskirjanduse traditsioonile alusepanija, ornitoloogiaprofessor Johannes Piiper ühendas oma 20. sajandi esimesel poolel kirjutatud loodusesseistikas teadusliku vaatlustäpsuse ja noor-eestiliku püüdluse esteetilisusele. Tema mantlipärijaks võime pidada tänaselgi päeval aktiivset loodusemeest Fred Jüssit, kes sai tuntuks eelkõige oma loodushäälte salvestuste ja neid esitlevate raadiosaadetega, kuid kes on ka meisterlik kirjutaja. Erinevatest looduskooslustest on kirjutanud bioloogid Haide-Ene Rebassoo, Rein Kuresoo, Viktor Masing, Rein Saluri. Omapärane identiteediloomeline mõttepäevik on teoloogi ja filosoofi Uku Masingu "Mälestusi taimedest".

Eesti looduskirjanduse arenguloo taustal on veel huvitav märkida, et Ameerika looduskirjanduse keskne teos, Henry David Thoreau "Walden" tõlgiti eesti keelde alles 1994. aastal. Võrdluseks – Rachel Carsoni "Hääletu kevad" ilmus eesti keeles juba 1968.

Lastele leidub loodusraamatuid seinast seina – alates teaduslikku vaatlust õpetavatest aimeraamatutest kuni ökomüstikani. Kuid ka sissevaateid taimede siseehitusse saab huvitava kunstnikutöö abil ulmeliseks seikluseks vormistada, nagu seda on teinud Oleg Mellov.

Nature is near

Ecosystems are formed through the cohabitation of individual species, the logic of which is explained by the core of our nature writing. In his nature essays of the early part of the 20th century, the professor of ornithology, Johannes Piiper, who laid the foundation to the tradition of Estonian nature writing, united the precision of scientific observation and the aspiration towards the aesthetic characteristic of the Young

Estonian literary group. His successor is Fred Jüssi, a naturalist who is active to this day and who became famous mostly as a result of his recordings of the sounds of nature and the radio shows presenting them, but who is also a masterful writer. Various ecosystems have been described by the biologists Haide-Ene Rebassoo, Rein Kuresoo, Viktor Masing, Rein Saluri. A singular identity-forming thought-diary is the "Remembrances of plants" by the theologian and philosopher Uku Masing.

In the context of the historical development of Estonian nature writing it is noteworthy that the central work of American nature writing, Henry David Thoreau's "Walden" was only translated into Estonian in 1994. By way of comparison: Rachel Carson's "Silent Spring" was translated already in 1968.

For children, there are very many and widely different books on nature, from popular books that teach scientific observation to ecological mysticism. But with good artistic work, even insights into the inner structure of plants can be turned into a fantastic adventure as has been done by Oleg Mellov.

V: Teoreetilisi vaateid

Professor Piiper oli ka eestikeelse rakubioloogia teerajaja. Tema "Biologialised kirjad" (1910–11) on esimene katse arendada vastavat oskussõnavara. Kuna nõukogude ajal oli teoreetiline bioloogia tugevasti politiseeritud (vt brošüüri "Mida õpetab mitšuurinlik bioloogia elust"), eelistasid paljud loodusteadlased tegeleda rakendusuuringute ja välibioloogiaga, mis on samuti eestikeelse arengus rolli mänginud.

Charles Darwini välibioloogilise merereisi kirjeldus avaldati vene keele vahendusel tehtud tõlkena 1949. Tema peateos "Liikide tekkimine", mille tõlkis Mart Niklus 1950. aastail meelsusvangina GULAGis, ilmus aga põhjalikult toimetatud tekstina alles 2012. aastal. Eestimaiste teoreetiliste bioloogide töödest osutagem veel Jakob von Uexkülli ja Karl Ernst von Baeri eesti keelde tõlgitud teadustöödele, samuti käsitlusele epigeneetika pooldajana tuntud Baeri suhetest darvinismiga.

Praegu ilmub Eestis sarjadena perioodiliselt olulisi tõlketeoseid, mis mõtestavad globaalseid keskkonnakriise. Eesti autorid on traditsiooniliselt jäänud pigem loodus- ja liigikaitse ning looduskasutuse teemade juurde, mõtestades eeskätt inimeste ja looduse suhteid lokaalses mõõtkavas.

Theoretical perspectives

Professor Piiper was also a pioneer of Estonian-language cell biology. His "Biological letters" (1910–11) was the first attempt in developing a suitable terminology. Since during the Soviet period theoretical biology was heavily politicised (see the brochure "What does Michurinist biology teach us about life"), many natural scientists preferred to practice applied science or field biology, both of which also had a positive impact on Estonian nature writing.

Charles Darwin's description of his biological voyage was published in 1949 in a translation based on a Russian source. His magnum opus, "On the Origin of Species" was translated by Mart Niklus in the 1950s as a political prisoner in GULAG, but was published as a thoroughly edited text only in 2012. Translated books by Jakob von Uexküll and Karl Ernst von Baer should also be mentioned as part of Estonian works on theoretical biology, as well as the discussion on Darwinism by Baer who himself supported the epigenetic view.

Today, important translated works are periodically published in various book series, which attempt to interpret global environmental crises. Estonian authors have tradi-

tionally limited themselves to issues of nature and species preservation and nature use, interpreting mainly the relations between human beings and nature in the local scale.

List of books

I Kaunis Eesti

Järva, Jaanus 2008. Looduse aasta. Retked Alam-Pedjal. Tallinn: Varrak
Leito, Tiit, Õnnepalu, Tõnu 1999. Vete sinisel piiril. Tartu: Eesti Loodusfoto
Jüssi, Fred 2003. Ajamustrid. Haabneeme: Pilgrim

Eesti kaunis loodus. 1958. Tallinn: Eesti Riiklik Kirjastus
Savisaar, Remo 2008. Loodus kutsub. Tallinn: Varrak
Ridala, Villem 1921. Ringi mööda kodumaad. Tallinn: Kirjastus Ühisus "Maa"
Parijõgi, Jüri 1937. Alutaguse metsades. Matkamälestusi. Tartu: K/Ü Loodus
Muusikus, Ingmar, Püttsepp, Juhani 2012. Sammud omas Eestis. Tallinn: Loodusajakiri
Kaldur, Marko 2004. Rännates läbi Eestimaa. Tallinn: Äripäeva kirjastus
Ots, Margus, Paal, Uku 2008. Eesti linnuvatleja teejuht. Tallinn: Tänapäev

II Õhus ja vees

Jüssi, Fred 1966. Kajakad kutsuvad. Tallinn: Eesti Raamat
Thom, Alma 1932. Vilsandi linnuriik. Tartu: K./Ü. "Loodus"
Mälk, August 1982. Jutte lindudest. Tallinn: Eesti Raamat
Kaigorodov, Dmitri 1923. Lindude riigist. Tallinn: Varrak
Kumari, Eerik 1966. Lindude laht. Tallinn: Valgus
Mäger, Mart 1994. Linnud rahva keeles ja meeles. Tallinn: Koolibri
Jüssi, Fred 2007. Linnuaabits. Tallinn: Ajakirjade Kirjastus

Tartes, Urmas, Põder, Jaak 2008. Legendiloomad: pisikesed loomad maailma kultuuriloos. Tallinn: Varrak
Kauri, Hans 1938. Lendlev värvi-ime (liblikad). Tartu-Tallinn: Loodus
Vilbaste, Gustav 1937. Kodumaa allikaist. Tallinn
Vilbaste, Kristel 2013. Eesti allikad. Tallinn: Varrak
Põldmaa, Kustas 1973. Koduvetel. Tallinn: Valgus
Ehrmann (Eerme), Karl 1935. Õngelatiga mööda Võrumaad. Kalakirjad ja miniatüürid. Võru: Noor-Eesti Kirjastus

III Karismaatiline megafauna

Püttsepp, Juhani 2009. Väikese hundi lood. Tallinn: Päike ja Pilv
Jõgisalu, Harri, Tihkan, Lembit 2004. Kohtumised... Tallinn: Ilo
Ernits, Peeter 2003. Mõned mu naabrid. Tallinn: Varrak
Ernits, Peeter 2005. Kivialused ja teised. Tallinn: Maalehe Raamat
Ernits, Peeter 2013. Jäljeaabits. Tallinn: Cum laude
Jüssi, Fred 1977. Rebasetund. Tallinn: Valgus
Jakobson, Carl Robert 1981. Lugemisraamat loodusest. Tallinn: Eesti Raamat

Hindrey, Karl August 1935. Meie metsloomad. Tartu: EKS
Roht, Richard1951. Jutte loomadest. Tallinn: Eesti Riiklik Kirjastus
Löns, Hermann 1919. Kuldkael. Tallinn: Rahvaülikool
London, Jack 1941. Valgekihv. Tallinn: Pedagoogiline Kirjandus
Hint, Aadu 1975. Angerja teekond. Tallinn: Eesti Raamat

Tammsaare, Anton Hansen 1974. Meie rebane. Tallinn: Eesti Raamat
Ristikivi, Karl 1983. Semud. Sellid. Tallinn: Eesti Raamat
Taar, Agnes 1936. Mustlase koer. Tartu: Noor-Eesti
Tammlaan, Evald 1940. Laevakoer Tuhk. Tartu: Loodus
Jaik, Juhan 1944. Nõiutud Tuks. Tallinn: Eesti kirjastus

IV Loodus on lähedal
Jüssi, Fred 1986. Jäälõhkuja. Tallinn: Valgus
Rebassoo, Haide-Ene 1975. Botaanilisi kilde 17 Hiiumaa suvest. Tallinn: Valgus
Kuresoo, Rein 2001. Loodus on lähedal. Tallinn: Maalehe Raamat
Masing, Uku 1996. Mälestusi taimedest. Tartu: Ilmamaa
Thoreau, Henry David 1994. Walden. Tallinn: Hortus Litterarum
Piiper, Johannes 1975. Pilte ja hääli Eesti loodusest. Loodussõbra muljeid maalt ja merelt. Tallinn: Eesti Raamat

Masing, Viktor 1984. Sinasõprus tammega. Tallinn: Valgus
Jüssi, Fred 1984. Estonian Birds and Animals. Tallinn: Kunst
Üllaste, Pilvi 1978. Avatud pähklipuu. Tallinn: Valgus
Petrone, Epp 2009. Siis kui seened veel rääkisid. Tartu: Petrone Print
Štšerbatõh, Valeri 2012. Metsloomalood. Haapsalu: Läänemaa linnuklubi
Saluri, Rein 1981. Linnud. Tallinn: Eesti Raamat
Kaplinski, Jaan 1977. Kes mida sööb, kes keda sööb. Tallinn: Eesti Raamat

V Teoreetilisi vaateid
Piiper, Johannes 1910–1911. Biologialised kirjad I–II. Tallinn: Eesti Kirjastuse-Ühisus
Haberman, Harald 1954. Mida õpetab mitšuurinlik bioloogia elust. Tallinn: Eesti Riiklik Kirjastus
Darwin, Charles 1949. Loodusuurija reis ümber maailma purjekal “Beagle”. Tartu: Teaduslik Kirjandus
Darwin, Charles 2012. Liikide tekkimine loodusliku valiku teel. Tartu: Eesti Looduseuurijate Selts
Uexküll, Jakob von 2013. Omailmad. Tartu: Ilmamaa
Valt, Maie 1977. K. E. Von Baer ja darvinism. Tallinn: Valgus
Baer, Karl Ernst von 1976. Eestlaste endeemilistest haigustest. Tallinn: Perioodika

Ponting, Clive 2002. Maailma roheline ajalugu: keskkond ja suurte tsivilisatsioonide kokkuvarisemine. Tallinn: Varrak
Lovelock, James 2007. Gaia kättemaks: miks Maa meie tegevusele vastu astub – ja kuidas me suudaksime siiski inimkonna päästa? Tallinn: Varrak
Eilart, Jaan 1976. Inimene, ökosüsteem ja kultuur. Tallinn: Perioodika
Kalle, Raivo, Sõukand, Renata 2013. Eesti looduslikud toidutaimed. Tallinn: Varrak
Viires, Ants 1975. Puud ja inimesed. Tallinn [või selle kordustrükk, 2000]
Maran, Timo, Tüür, Kadri 2005. Eesti looduskultuur. Tartu: Eesti Kirjandusmuuseum
Carson, Rachel 1968. Hääletu kevad. Tallinn: Valgus

Photo 1. Looduse piiritlemine: eesti looduskirjanduse lugu. Framing nature: the story of Estonian nature writing. General view of the exhibition.

Photo 2. Kaunis Eesti. Beautiful Estonia.

Photo 3. Õhus ja vees. In the air, on the water.

Photo 4. Karismaatiline megafauna. Charismatic megafauna.

Photo 5. Loodus on lähedal. Nature is near.

Photo 6. Teoreetilisi vaateid. Theoretical perspectives.

All photos by Kadri Tüür.

CURRICULUM VITAE

Name: Kadri Tüür
Date of birth: 15.12.1975
E-mail: tyyr@ut.ee
Address: University of Tartu, Institute for cultural research and fine arts, Department of literature and theatre studies, Ülikooli 16, 51014, Tartu, Estonia

Career

2014–...	Estonian Centre for Environmental History, Tallinn University, coordinator
2012–...	University of Tartu, Institute for cultural research and fine arts, Department of literature and theater studies, researcher
2010–2014	Estonian Literary Museum, project manager / researcher
2005–2010	Muhu Museum, director
2003–2005	Estonian Literary Museum, researcher

Education

2003–2015	doctoral studies in Semiotics and Culture Studies, University of Tartu
2000–2003	MA in Semiotics and Theory of Culture, University of Tartu
1999–2002	MA in Comparative Literature, University of Turku, Finland
1994–1999	BA in Estonian Literature, University of Tartu

Fields of research

Estonian nature writing, Estonian literature, ecocriticism, biosemiotics, ecosemiotics, environmental history

Major publications

Maran, Timo; Tüür, Kadri 2017. From birds and trees to texts: An ecosemiotic look at Estonian nature writing. In: John Parham, Louise Westling (eds.), *A Global History of Literature and the Environment*. Cambridge: Cambridge University Press, 286−300.

Tüür, Kadri 2016. Semiotics of textual animal representations. In: Timo Maran, Morten Tønnessen, Silver Rattasepp (eds.), *Animal Umwelten in a Changing World: Zoosemiotic Perspectives*. Tartu Semiotics Library, 18. Tartu: University of Tartu Press, 222−239.

Tüür, Kadri, Stern, Karl 2015. Atlantic herring in Estonia: In the transverse waves of international economy and national ideology. *Journal of Baltic Studies* 46(3), 393–408.
DOI: dx.doi.org/10.1080/01629778.2015.1073928

Tüür, Kadri 2014. Like a fish out of water: Literary representations of fish. In: Kadri Tüür, Morten Tønnessen (eds.), *The Semiotics of Animal Representations*. NCL, 10. Amsterdam, New York: Rodopi, 263–288.

Talivee, Elle-Mari, Tüür, Kadri 2013. Libahunt: loom, inimene või naine? [The Werewolf: an Animal, a Man, or a Woman?] *Looming*, 6, 857−867.

Tüür, Kadri, Reitalu, Triin 2012. Botanical nature writing: An ecocritical analysis. *Estonian Journal of Ecology* 61(1), 9–19.
DOI: 10.3176/eco.2012.1.03

Tüür, Kadri 2009. Bird sounds in nature writing: Human perspective on animal communication. *Sign Systems Studies* 37(3/4), 226–255.
DOI: http://dx.doi.org/10.12697/SSS.2009.37.3–4.11

Tüür, Kadri 2008. Water's three states in an Antarctic traveller's imagination. *Concentric: Literary and Cultural Studies*, 34 (1), 113−133.

Pilv, Aare, Tüür, Kadri 2002. *Sündmus.Koht*. [Event.Place.] Tallinn: Underi ja Tuglase Kirjanduskeskus.

Edited volumes

Tüür, Kadri, Tønnessen, Morten (eds.) 2014. *The Semiotics of Animal Representations*. Amsterdam, New York: Rodopi.

Lukas, Liina, Plath, Ulrike, Tüür, Kadri (eds.) 2011. *Umweltphilosophie und Landschaftsdenken im baltischen Kulturraum / Environmental Philosophy and Landscape Thinking*. collegium litterarum, 24. Tallinn: Underi ja Tuglase Kirjanduskeskus.

Maran, Timo, Tüür, Kadri (toim.) 2005. *Eesti looduskultuur*. [Estonian Culture of Nature.] Tartu: Eesti Kirjandusmuuseum.

Maran, Timo, Tüür, Kadri (toim., koost.) 2000. *Tekst ja loodus*. [Text and Nature.] Tartu: Eesti Kirjanduse Selts.

Co-editor of the journal *Studia Vernacula* since 2013.

ELULOOKIRJELDUS

Nimi: Kadri Tüür
Sünniaeg: 15.12.1975
E-post: tyyr@ut.ee
Aadress: Tartu Ülikool, Kultuuriteaduste ja kunstide instituut, kirjanduse ja teatriteaduse osakond, Ülikooli 16, 51014, Tartu, Eesti

Teenistuskäik

2014–... Keskkonnaajaloo Keskus, Tallinna Ülikool, koordinaator
2012–... Tartu Ülikool, Kultuuriteaduste ja kunstide instituut, kirjanduse ja teatriteaduse osakond, eesti kirjanduse õppetool, teadur
2010–2014 Eesti Kirjandusmuuseum, projektijuht / teadur
2005–2010 Muhu Muuseum, juhataja
2003–2005 Eesti Kirjandusmuuseum, teadur

Haridus

2003–2015 doktorantuur Tartu Ülikoolis semiootika ja kultuuriteooria erialal
2000–2003 MA, Tartu Ülikool, semiootika ja kulturoloogia
1999–2002 MA, Turu Ülikool, võrdlev kirjandusteadus
1994–1999 BA, Tartu Ülikool, eesti kirjandus

Uurimisvaldkonnad

Eesti looduskirjandus, eesti kirjandus, ökokriitika, biosemiootika, ökosemiootika, keskkonnaajalugu

Peamised publikatsioonid

Maran, Timo; Tüür, Kadri 2017. From birds and trees to texts: An ecosemiotic look at Estonian nature writing. In: John Parham, Louise Westling (eds.), *A Global History of Literature and the Environment*. Cambridge: Cambridge University Press, 286−300.

Tüür, Kadri 2016. Semiotics of textual animal representations. In: Timo Maran, Morten Tønnessen, Silver Rattasepp (eds.), *Animal Umwelten in a Changing World: Zoosemiotic Perspectives*. Tartu Semiotics Library, 18. Tartu: University of Tartu Press, 222–239.

Tüür, Kadri, Stern, Karl 2015. Atlantic herring in Estonia: In the transverse waves of international economy and national ideology. *Journal of Baltic Studies* 46(3), 393–408.
DOI: dx.doi.org/10.1080/01629778.2015.1073928

Tüür, Kadri 2014. Like a fish out of water: Literary representations of fish. In: Kadri Tüür, Morten Tønnessen (eds.), *The Semiotics of Animal Representations*. NCL, 10. Amsterdam, New York: Rodopi, 263–288.

Talivee, Elle-Mari, Tüür, Kadri 2013. Libahunt: loom, inimene või naine? *Looming*, 6, 857−867.

Tüür, Kadri, Reitalu, Triin 2012. Botanical nature writing: An ecocritical analysis. *Estonian Journal of Ecology* 61(1), 9–19. DOI: 10.3176/eco.2012.1.03

Tüür, Kadri 2009. Bird sounds in nature writing: Human perspective on animal communication. *Sign Systems Studies* 37(3/4), 226–255. DOI: http://dx.doi.org/10.12697/SSS.2009.37.3–4.11

Tüür, Kadri 2008. Water's three states in an Antarctic traveller's imagination. *Concentric: Literary and Cultural Studies*, 34 (1), 113−133.

Pilv, Aare, Tüür, Kadri 2002. *Sündmus.Koht*. [Event.Place.] Tallinn: Underi ja Tuglase Kirjanduskeskus.

Toimetatud kogumikud

Tüür, Kadri, Tønnessen, Morten (eds.) 2014. *The Semiotics of Animal Representations*. Amsterdam, New York: Rodopi.

Lukas, Liina, Plath, Ulrike, Tüür, Kadri (eds.) 2011. *Umweltphilosophie und Landschaftsdenken im baltischen Kulturraum / Environmental Philosophy and Landscape Thinking*. collegium litterarum, 24. Tallinn: Underi ja Tuglase Kirjanduskeskus.

Maran, Timo, Tüür, Kadri (toim.) 2005. *Eesti looduskultuur*. Tartu: Eesti Kirjandusmuuseum.

Maran, Timo, Tüür, Kadri (toim. ja koost.) 2000. *Tekst ja loodus*. Tartu: Eesti Kirjanduse Selts.

Ajakirja *Studia Vernacula* kaastoimetaja aastast 2013.

DISSERTATIONES SEMIOTICAE UNIVERSITATIS TARTUENSIS

1. **Михаил Ю. Лотман.** Структура и типология русского стиха. Тарту, 2000.
2. **Елена Григорьева.** Эмблема: структура и прагматика. Тарту, 2000.
3. **Valdur Mikita.** Kreatiivsuskäsitluste võrdlus semiootikas ja psühholoogias. Tartu, 2000.
4. **Ирина Аврамец.** Поэтика новеллы Достоевского. Тарту, 2001.
5. **Ян Левченко.** История и фикция в текстах В. Шкловского и Б. Эйхенбаума в 1920-е гг. Тарту, 2003.
6. **Anti Randviir.** Mapping the world: towards a sociosemiotic approach to culture. Tartu, 2004.
7. **Timo Maran.** Mimikri kui kommunikatsiooni-semiootiline fenomen. Tartu, 2005.
8. **Элеонора Рудаковская-Борисова.** Семиотика пищи в произведениях Андрея Платонова. Tartu, 2005.
9. **Andres Luure.** Duality and sextets: a new structure of categories. Tartu, 2006.
10. **Peeter Linnap.** Fotoloogia. Tartu, 2006.
11. **Daniele Monticelli.** Wholeness and its remainders: theoretical procedures of totalization and detotalization in semiotics, philosophy and politics. Tartu, 2008.
12. **Andreas Ventsel.** Towards semiotic theory of hegemony. Tartu, 2009.
13. **Elin Sütiste.** Tõlke mõiste dünaamikast tõlketeaduses ja eesti tõlkeloos. Tartu, 2009.
14. **Renata Sõukand.** Herbal landscape. Tartu, 2010.
15. **Kati Lindström.** Delineating Landscape Semiotics: Towards the Semiotic Study of Landscape Processes. Tartu, 2011.
16. **Morten Tønnessen.** Umwelt transition and Uexküllian phenomenology. An ecosemiotic analysis of Norwegian wolf management. Tartu, 2011. 231 p.
17. **Anu Sarv.** Õppejõu enesereflеksioon ja professionaalne identiteet. Tartu, 2013, 141 lk.
18. **Vadim Verenich.** Semiotic models of legel argumentation. Tartu, 2014, 249 lk.
19. **Maarja Ojamaa.** The transmedial aspect of cultural autocommunication. Tartu, 2015, 173 p.
20. **Tiit Remm.** Sociocultural Space: Spatial Modelling and the Sociocultural World. Tartu, 2015, 142 p.
21. **Riin Magnus.** The Semiotic Grounds of Animal Assistance: Sign Use of Guide Dogs and Their Visually Impaired Handlers. Tartu, 2015, 154 p.
22. **Davide Weible.** Exaptation: Towards a Semiotic Account of a Biological Phenomenon. Tartu, 2016, 144 p.

23. **Mari-Liis Madisson.** The Semiotic Construction of Identities in Hypermedia Environments: The Analysis of Online Communication of the Estonian Extreme Right. Tartu, 2016, 195 p.
24. **Claudio Julio Rodríguez Higuera.** The Place of Semantics in Biosemiotics: Conceptualization of a Minimal Model of Semiosic Capabilities. Tartu, 2016, 148 p.