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A PIONEER OF NORDIC CONSERVATION: THE ENVIRONMENTAL LITERACY OF A. E. NORDENSKIÖLD (1832-1901)

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Tämä väitöskirja osoittaa, että Nils Adolf Erik Nordenskiöld (1832-1901), Suomessa syntynyt ja Ruotsissa uransa luonut tiedemies ja tutkimusmatkailija, oli ympäristönluku-taitoinen henkilö ennen kuin ympäristönlukutaito käsite syntyi 1960-luvulla. Hän havaitsi vuosien 1858 ja 1883 välillä tekemillään arktisilla tutkimusmatkoilla ihmisten aikaan-saamia tuhoja luonnossa, joiden perusteella hän ryhtyi toimiaan niin, että pystyisi ylläpitämään, säilyttämään ja parantamaan luonnossa vallitsevaa tervettä tasapainoa: toimenpiteitä, jotka ovat ympäristön lukutaidon peruselementtejä. Ajatukset, joita hän ilmaisi teksteissään, kertovat, että hän oli ympäristönlukutaitoinen. Varsinkin hänen vuonna 1880 kirjoittamansa lyhyt tutkielma "Förslag till inrättandet af Riksparker i de nordiska länderna" on tästä hyvä esimerkki. Tämä tutkielma on vuosien kuluessa saanut keskeisen aseman pohjoismaisen luonnonsuojelun historiassa.

Tässä väitöskirjassa ympäristöhistoria, taloushistoria, aatehistoria ja kansatiede, tieteen- ja maailman-katsomushistoria yhdistyvät tutkimusmatkojen, luonnonsuojelun ja arktisten alueiden tutkimukseen. Tämä on ensimmäinen ympäristöhistoriallinen tutkimus Norden-skiöldistä.

Väitöskirjan artikkelit kertovat Nordenskiöldin elämästä ja urasta, hänen kiinnostuksen kohteistaan ja ympäristönlukutaidostaan. Niissä myös analysoidaan, mikä hänen asemansa oli ja on pohjois-maisen luonnonsuojelun historiassa. Luonnonsuojeluliikettä voi nimittää taisteluksi luonnon puolesta. Nordenskiöld halusi taistella uudenlaista infrastruktuuria ja teknistä kehitystä vastaan, jotka uhkasivat alkuperäistä luontoa, ja hän halusi estää ekologiset katastrofit. Siksi hän ehdotti, että perustettaisiin kansallispuistoja, joissa alkuperäinen luonto säilyisi seuraavien sukupolvien iloksi ulkoilma-museoissa. Monet hänen työtoverinsa Ruotsissa, Suomessa ja muissa maissa jakoivat hänen huolensa ja jatkoivat hänen kuolemansa jälkeen työtä luonnonsuojelun hyväksi. Vuonna 1909 Ruotsin ensimmäiset kansallispuistot perustettiin paikkoihin, joita Nordenskiöld suositteli "Förslagissaan": "valtion omistamille maille [...] jotka tuottavat vain vähän tai ei ollenkaan taloudellista hyötyä."

Ympäristön lukutaito käsitettä voidaan tämän väitöskirjan perustelujen mukaan käyttää yhden historiallisen henkilön tutkimuksessa. Nordenskiöldin esimerkki saa meidät myös ymmärtämään, että jokainen yksilö on tärkeä ympäristön historiassa: että jokaisella yksilöllä on oma vaikutuksensa historiaan ja ympäristöön.

Avainsanat: ympäristöhistoria, ympäristönlukutaito, Pohjoismaiden luonnonsuojelun his-toria, arktiset tutkimusmatkat, arktiset tutkimusmatkailijat, Adolf Erik Nordenskiöld (1832-1901).

UNIVERSITY OF TURKU

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NIEMI, SEIJA ASTRID: A Pioneer of Nordic Conservation: The Environmental Literacy of

A. E. Nordenskiöld (1832-1901)

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This doctoral thesis will show that Nils Adolf Erik Nordenskiöld (1832-1901), a Finnish born Swedish scientist and explorer, was an environmentally literate person before the concept of environmental literacy was formulated in the 1960s. During his Arctic expeditions, between 1858 and 1883, Nordenskiöld observed destructive processes in the natural world caused by humans and he took appropriate action to maintain, restore, or improve the health of the systems in nature: features, which are substantive qualifications of environmental literacy. He presented environmentally literate ideas in his writings, especially in his short essay, written in 1880 and entitled “Förslag till inrättandet af Riksparker i de nordiska länderna.” This essay has subsequently gained a reputation as one of the founding texts in the history of early Nordic conservation.

This work brings together scholarship in environmental history, economic history, the history of ideas and ethnology, the history of science and the history of ideologies; the study of explorations, conservation and the Arctic regions. It is the first research to be carried out on Nordenskiöld from the point of view of environmental history.

The articles that make up this dissertation will discuss different sides of Nordenskiöld’s life and career, his interests and environmentally literate expressions. They also analyse his position in the history of Nordic conservation. A conservation movement can be seen as a military-like organisation to protect nature. Nordenskiöld wanted to fight against new kinds of infrastructure and technological innovations, which threatened pristine nature and he wanted to prevent any ecological disasters. This is why he suggested the establishment of national parks in which pristine nature could be saved in open-air museums to be enjoyed by future generations. Many of his colleagues, in Sweden, Finland and abroad, shared his concerns and, continued to argue for conservation after his death. The first nine national parks in Sweden were established in 1909 in places recommended by Nordenskiöld in “Förslag”: “publicly owned land [...] which yield insignificant or no profit”.

This doctoral dissertation proves that the concept of environmental literacy can be used in a case study in a historical perspective. Nordenskiöld’s example helps us to understand the important role of every individual in the history of the environment: the fact that everybody has an impact on history and on the environment.

Keywords: environmental history, environmental literacy, the history of Nordic conservation, Arctic expeditions, Arctic explorers, Adolf Eric Nordenskiöld (1832-1901).

THE ARTICLES OF THIS DOCTORAL DISSERTATION

Environmental Literacy. In *Ethnology in the 21st Century. Transnational Reflections of Past, Present and Future*, edited by Jussi Lehtonen and Salla Tenkanen, 101-111. Turku: Kansa-tiede, Turun yliopisto - European Ethnology, University of Turku, 2010. ISBN 978-951-29-4382-1

How fossils gave the first hints of climate change: The explorer A. E. Nordenskiöld's passion for fossils and northern environmental history. In *Northscapes: History, Technology, and the Making of Northern Environments*, edited by Dolly Jørgensen and Sverker Sörlin, 39-56. Vancouver: University of British Columbia Press, 2013. ISBN 978-0-7748-2572-6

Exploring Environmental Literacy from a Historical Perspective: How observations of the Arctic natural environment by a nineteenth-century scholar resulted in a proposal for establishing national parks in the Nordic countries. In *Environmental History in the Making. Volume I: Explaining*, edited by Estelita Vaz, Cristina Joanaz de Melo and Ligia M. Costa Pinto, 49-69. International: Springer, 2016. ISSN 2211-9027 (electronic), ISBN 978-3-319-41085-2 (eBook)

The Historical Roots of A. E. Nordenskiöld's (1832–1901) Conservational Philosophy. *Scandinavian Journal of History*, Feb. 5, 2018: 1-20. DOI: 10.1080/03468755.2018.1430596

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In 2005, after I had finished my licentiate thesis entitled *Suomalaisen metsäluonnon lukemisen historiaa – Ihmisen ja koivun muuttuva suhde Suomessa 1730-luvulta 1930-luvulle*, I was 58 years old. I started my cultural history studies at the University of Turku in 1996. When I was young, I had no ambitious dreams of having a good job, a good salary or a successful career. After I graduated from high school at the end of the 1960s, I studied for one year in a commercial institute, and qualified in business and administration in order to acquire some kind of profession. I just wanted to be a mother and a housewife, to have wonderful children and a beautiful home. All my dreams came true. I had wonderful children and a beautiful home and a loving husband. When my children grew older and did not need to be looked after so much, I worked from time to time in companies, which my husband or I established. Occasionally we even had lots of money. In the 1990s, my life totally changed. During the deep recession we lost our whole fortune. When our children began to study and left home I asked myself, what I wanted to do with the rest of my life and concluded that I wanted to study history and write non-fiction books. These dreams have come true as well.

After I obtained my licentiate thesis, I decided to try and further my studies by becoming a Doctor in Philosophy. I consulted the supervisor of my licentiate thesis, Professor Timo Myllyntaus at the University of Turku. He promised that he would continue to be my supervisor during my doctoral studies. He suggested that I should write on Adolf Erik Nordenskiöld (1832–1901), the Finnish-Swedish scientist and explorer, who also was a promoter of conservation in the Nordic countries. I myself had thought about writing my thesis about a not-so-well known Finnish businessman, Rudolf Elving (1849–1927), since I had studied his life over the course of many years and had dreamt about writing his biography. Nevertheless, I listened to Professor Myllyntaus and began my research on Nordenskiöld.

Now I have finished my work on Nordenskiöld. In tandem with my doctoral studies I have written seven non-fiction books, which certainly slowed down my work on my doctoral dissertation. A biography of Elving is not to be found among these works, but I am sure that one day it will be published. During the years that I have worked on my doctoral dissertation, I have been extremely lucky to have enjoyed the support of many wonderful people and foundations, to whom I am very grateful. In Finland, I have been supported by the Svenska Litteratursällskapet i Finland r.f., Nordenskiöld-samfundet i Finland, Svenska Kulturfonden, Suomalais-ruotsalainen kulttuurirahasto, Koneen Säätiö, Historia-tieteiden tohtorihjelma, Suomalainen Konkordia-liitto, Turun Yliopistosäätiö, Artturi H. Virkkusen historia-tieteellinen avustusrahasto, Oikeusneuvos F. O. Liliuksen stipendirahasto, Professori Einar W. Juvan stipendirahasto and the Department of Finnish History at The University of Turku. In Sweden, I received a stipend from Letterstedska Föreningen. I also received financial support from the European Society for Environmental History, which enabled me to attend various conferences, symposiums and congresses. My supervisors, first professor

Timo Myllyntaus and Laura Hollsten, and subsequently, Mika Kallioinen and Tuomas Räsänen, have given supportive and constructive advice, for which I am very grateful. I have also had the splendid opportunity to undertake fruitful cooperation with Martti Blåfield, an expert on the life of Nordenskiöld, as well as with Anna-Maija Pietilä-Ventelä, who was the head of the Nordenskiöld Collection at the National Library of Finland in Helsinki. During my several visits to the Centre for History of Science at the Royal Swedish Academy of Sciences in Stockholm, the personnel, especially Anne Miche de Malleray, has always been extremely helpful in providing me with source material from the Nordenskiöld Files. In addition to all the above-mentioned groups and persons, I am very grateful to all my friends and relatives in Finland and abroad, who have supported me with good advice and encouragement during my studies. Warm thanks to my children, their spouses, grandchildren, my brother and his spouse. Without you my job would have been much harder.

Turku 12.6.2018

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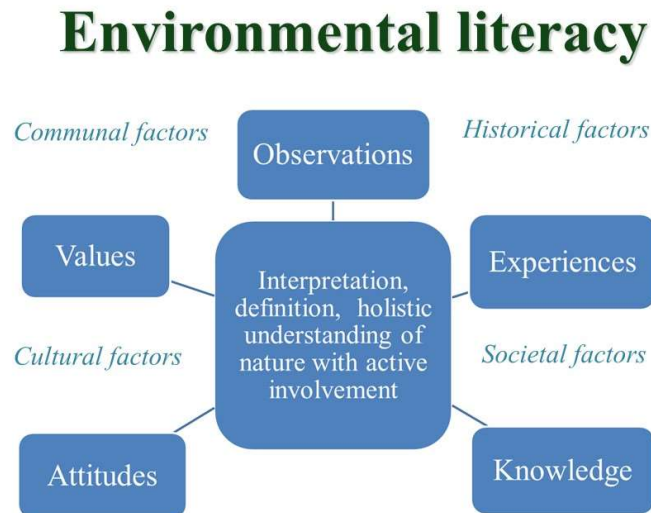
Adolf Erik Nordenskiöld in the 1870s.
From Album 2:5, Center for History of Science, The Royal Swedish Academy of Sciences.

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Introduction

The concept of *environmental literacy* was expounded by Charles E. Roth, an American scholar, in the 1960s. According to him environmental literacy is basically “the capacity to perceive and interpret the relative health of environmental systems and take appropriate action to maintain, restore, or improve the health of those systems.”¹ In other words, a person is capable of perceiving harmful developments in his/her environment, that is, to “read” the environment. A person is also able to react to destructive changes, either by preventing or remedying them, that is, to “write” his/her own environment.



PICTURE 1. Environmental Literacy: The environmental literacy of a person includes his/her way of thinking, knowledge, understanding, attitudes and the values he/she holds towards the environment. It also depends on family factors, as well as the way they have taught to appreciate the surrounding community and society.

In general, environmental literacy is related to environmental education. Researchers in other disciplines, such as geography, have employed environmental literacy in studies on the contemporary environment. For instance, the Finnish geographers Anu Eskonheimo and Minna Hares have applied the concept in their interpretation of values, attitudes, knowledge and experiences of certain regions.²

¹ Roth, *Environmental Literacy: Its root's, Evolution and Directions in the 1990's*, 3.

² Eskonheimo, *Women, Environmental Change*; Hares, *Community Forestry*.

Environmental literacy varies between individuals depending, for example, on age, gender, education, profession, social position, political ideology and dwelling place. A child learns environmental literacy from her or his parents, other adults and through peer enculturation. The development of environmental literacy continues throughout a person's life.³

My hypothesis is that Nils Adolf Erik Nordenskiöld⁴, a Finnish-born Swedish scientist and explorer, was an environmentally literate person before this concept had been formulated. My doctoral thesis is, as far as I am aware, innovative in its use of the concept of environmental literacy in regard to a historical case study. Nordenskiöld perceived destructive processes in the natural world, which had been caused by humans and he took appropriate action to maintain, restore and improve the health of systems in nature. Such conduct contains substantive features of environmental literacy. His environmentally literate ideas are present in his writings, especially in his short essay "Förslag till inrättandet af Riksparker i de nordiska länderna" (A Proposal for Establishing National Parks in the Nordic⁵ Countries) (hereafter "Förslag"), which he wrote in the summer of 1880. Since its publication, "Förslag" has gained a reputation as one of the founding texts of early Nordic conservation.⁶ Furthermore, Nordenskiöld is one of the early links in the chain of awakening of environmental awareness in Europe.

Conservation history is an essential ingredient in the study of environmental history. As the American environmental historian Roderick F. Nash states, "it offers important insights into the national identity and purpose as well as into a people's aesthetic, religious, and ethical convictions. These are what shape the environment; and the shape of the environment, in turn, gives rise to new ideas and policies."⁷ It is worth knowing something about national environmental tastes when attempting to advance conservation policies today. According to Nash, "one of the best places to acquire such information is from an examination of how it was formed."⁸ A study of Nordenskiöld's life opens up a view onto the national tastes of his time. He was a member of the upper class and he was a scientist. The first advocates of conservation in Finland and Sweden were members of these social groups. Their attitudes and values were reflected in Nordenskiöld's attitudes and values, which he expressed in his writings. The Finnish environmental historian Leena Rossi argues

³ Disinger and Roth, *Environmental Literacy*, 4-5; Hares et al. "Environmental Literacy," 5-6; Hsu and Roth, "An Assessment of Environmental Literacy," 229-49.

⁴ In international literature, Nordenskiöld is often called Nils Nordenskiöld since his official name was Nils Adolf Erik. Along with his family and friends, he used the name Adolf and he signed his letters A. E. Nordenskiöld.

⁵ I use the notion of 'Nordic' because, Nordenskiöld used the Swedish word 'nordisk' in his texts, meaning the Scandinavian countries including Finland. In the same way, the word 'Nordic' includes all the Scandinavian countries plus Finland. The notions of 'Scandinavia' and 'northern-Europe' can both be misunderstood, since the word Scandinavia connotes only Sweden, Norway, and Denmark without Finland and Iceland, and Northern-Europe includes Great Britain, Ireland and the Baltic countries. Thus, I consider 'Nordic' is correct in this context although some may find its use anachronistic.

⁶ See, for instance, Conwentz, "Om skydd," 36, 42; Hakala and Välimäki, *Ympäristön tila*, 28; Haraldsson, *Skydda vår natur*, 75; Lundgren, *Staten och naturen*; Myllyntaus, "Suomalaisen ympäristöhistorian," 327; Palmén, "Om naturskydd," 2-3; Sehlin, *Känn ditt land*, 41; Sundin, "Från riksparker," 153-4; Wramner and Nygård, *Från naturskydd*, 15.

⁷ Nash, *American Environmentalism*, 3-4.

⁸ Nash, *American Environmentalism*, 7-8.

that even though every human being has a unique relationship with the environment, this relationship also reflects the environmental relationship of his or her society and of the whole of humankind.⁹

The goal of my dissertation is to discern and study the motivational forces underlying Nordenskiöld's conservational philosophy. I use the concept of environmental literacy as an analytical tool. The principal questions addressed in my thesis are as follows: How did Nordenskiöld research, perceive and experience the environment during his Arctic expeditions? How did he react to his perceptions and observations? Can we call his reactions environmental literacy? What were the roots of his conservational philosophy? What kind of influence did he have on the subsequent conservation movement in Finland and Sweden?

The articles that comprise this thesis will provide answers to these questions. Herein, I study different aspects of Nordenskiöld's life and career, as well as his interests and environmentally literate expressions. I also examine his role in the history of Nordic conservation. A certain degree of repetition is unavoidable in such a doctoral thesis, since the articles have been published in different literary forums for a variety of readers. Three of my articles have been published in peer reviewed edited volumes and one in a peer reviewed journal. The span of time from the publication of my first article to the last one covers several years, so the reader is able to grasp the development of my ideas in my studies.

When I wrote my first article on Nordenskiöld, entitled "Environmental Literacy," in 2008, I was in the process of building up a general view on the concept of environmental literacy from a historical perspective. I introduce the main ideas of the concept of environmental literacy and the basic facts regarding Nordenskiöld's life and his Arctic expeditions. This article is based on a presentation I delivered at an ethnology conference held in Turku in 2008. The article was published in *Ethnology in the 21st Century: Transnational Reflections of Past, Present and Future* in 2010.

My second article focuses Nordenskiöld's geological and mineralogical interests. Fossils fascinated him greatly. Fossils reveal information about the Earth's origins and natural phenomena of ancient environments, as well as about the extinction of animals and vegetation in the past. The discovery of fossil mammals in northern Europe in the nineteenth century indicated that drastic climatic change had taken place over times. Moreover, this demonstrated that fossils play a fundamental role in explaining earlier climate change. My article, "How Fossils Gave the First Hints of Climate Change: The Explorer A. E. Nordenskiöld's Passion for Fossils and Northern Environmental History" (hereafter "How Fossils"), was published in *Northscapes: History, Technology, and the Making of Northern Environments* in 2013. This book contains a series of articles by participants of the Nordic Environmental History Network, which organized several workshops in different Nordic countries between 2009 and 2011.

My third article, "Exploring Environmental Literacy from a Historical Perspective: How Observations of the Arctic Natural Environment by a Nineteenth-century Scholar Resulted in a Proposal for Establishing National Parks in the Nordic countries" (hereafter "Exploring Environmental Literacy"), focuses on Arctic animal species. Nordenskiöld

⁹ Rossi, "Yksilöllä on väliä," 79.

combined his own observations, experiences and environmental knowledge with those of his colleagues and Arctic inhabitants, as well as knowledge he acquired from books in his library. The threat of excessive and destructive hunting and fishing led him to draft proposals for preventing and resolving environmental damage. He was one of the first individuals who “spoke up” for wild nature in Northern Europe. Many of his colleagues shared his concerns and continued his conservational endeavours after his death. This article was published in *Environmental History in the Making. Volume I: Explaining* in 2016. The article is based on my presentation at the Second World Congress of Environmental History (WCEH), in Guimarães, Portugal in July 2014.

In my fourth article, “The Historical Roots of A. E. Nordenskiöld’s (1832-1901) Conservational Philosophy” (hereafter “Historical Roots”), I discuss such subjects as the modernization process and the patriotic influence of the Romantic era. I also analyse the influence of George Catlin, the American painter, author and traveller. He was the first person in the United States to propose the opening of national parks in the 1840s. I also examine the influence of Nordenskiöld on the subsequent conservation movement in Finland and Sweden. The first national parks in Europe were established in Sweden in 1909 and followed the proposals made by Nordenskiöld. This article was published in *Scandinavian Journal of History* in February 2018.

Nordenskiöld is a well-known Nordic explorer and scientist, but little scholarly work has been devoted to studies about him and his Arctic expeditions. His successors, such as Fridtjof Nansen (1861-1930), Roald Amundsen (1872-1928), Robert Peary (1856-1920) and Robert Scott (1868-1912), have received more attention.¹⁰ Nordenskiöld’s life and expeditions are well described in a number of biographies, such as Sven Hedin’s *Adolf Erik Nordenskiöld: en levnadsbeskrivning* (1926), Henrik Ramsay’s *Nordenskiöld, merenkulkija* (1953), and George Kish’s *North-East Passage: Adolf Erik Nordenskiöld, his Life and Times* (1973). More recently, Martti Blåfield published *Nordenskiöld, suomalais-syntyisen tutkimusmatkailijan & tiedemiehen elämä* in the fall of 2016. These biographies are, however, not analytical studies. In addition to biographies, his expeditions and his cartographical collection are well described in various articles.¹¹

Nordenskiöld’s ideas and philosophy influenced his contemporaries. For example, the German scientist Hugo Conwentz (1855-1922) visited Sweden several times at the turn of the nineteenth and twentieth centuries. Conwentz subsequently wrote that these visits significantly influenced his ideas on nature and on conservation. In an article that appeared in the Swedish scientific periodical *Ymer* in 1904, Conwentz credited Nordenskiöld as “the original initiator of the idea of nature conservation” in Scandinavia.¹² His acknowledgement of Nordenskiöld is important, since Conwentz enjoys the status of being the first leading figure in the history of European conservation. In 2006, the Swedish historian Urban

¹⁰ See, for example, Herzig, *Suffering for Science*; Huntford, *Nansen*; Khorkina, “Who were these brave men?”; Lankford, “Arctic Explorer Robert E. Peary’s Other Quest”; Riffenburg, *The Myth of an Explorer*.

¹¹ See, for instance Forselles-Riska, *A. E. Nordenskiöld Collection*; Häkli, *A. E. Nordenskiöld, A Scientist and his Library*; Jaatinen, “Adolf Erik Nordenskiöld”; Kish, “Adolf Erik Nordenskiöld”; Markkanen et al., *Avartuva maailma*; Lindgren, “Nils Adolf Erik Nordenskiöld”; Odelberg, “A. E. Nordenskiöld collection in Stockholm.”

¹² Conwentz, “Om skydd,” 42. The original text reads: “friherre A. E. Nordenskiöld [...] i de skandinaviska länderna var den geniale upphofsmannen till idén om naturskydd”.

Wråkberg, for example, named Conwentz as the key figure in the development of the idea of conservation in Europe.¹³ Wråkberg points to Conwentz's recommendation, made in 1914, to protect nature in Spitsbergen in order to demonstrate his argument. However, in my article "Historical Roots," I argue that the ideas of Nordenskiöld, which were similar to those of Conwentz, preceded the German's by several decades. The German historian Richard Hölzl also gave Conwentz all the credit for introducing the idea of conservation in Europe in an article published in 2006.¹⁴ The ideas that Nordenskiöld formulated in the 1880s are most probably not known to Hölzl when writing his article. The multifaceted problem regarding the question of influence is one of the main topics of my thesis. However, it is necessary to bear in mind the following astute statement by the American environmental historian Michael Williams: "In the world of ideas, it is almost impossible to disentangle the seemingly simple question of who influenced whom, whose ideas were borrowed and improved upon by whom."¹⁵

My doctoral thesis stands at the junction of various branches of historical inquiry. I have explored "the political, social, and economic contexts in which the environmental actions and policies that influenced the environment took shape," as the American historian Richard White has suggested.¹⁶ My work brings together scholarship on environmental history, economic history, the history of ideas and ethnology, the history of science and the history of ideologies. It also incorporates notions from studies related to exploration, conservation and the Arctic. In the line with the esteemed American environmental historian Donald Worster, I aim to find "a deeper awareness of the roots of our contemporary perception of nature."¹⁷ My study on Nordenskiöld ranks as the first work on this important figure from the perspective of environmental history.

¹³ Wråkberg, "Nature Conservationism," 1-23. Spitsbergen is today better known as Svalbard. Spitsbergen is actually one of the greatest island of the archipelago of Svalbard, but since Nordenskiöld used the word Spitsbergen to describe the whole archipelago, I follow his example in my thesis.

¹⁴ Hölzl, "Nature Conservation in the Age of Classical Modernity," 27-52.

¹⁵ Williams, "Thinking about the Forest," 1983, 268-9.

¹⁶ White, "American Environmental History," 334.

¹⁷ Worster, *Nature's Economy*, xvii.

Methods and Concepts

The Backbone of the Thesis: Environmental History

Environmental historians examine the history of the human-nature dialogic relationship. Donald Worster astutely notes that the essential purpose of environmental history is “to explore the ways in which the biophysical world has influenced the course of human history and the ways in which people have thought about and tried to transform their surroundings.”¹⁸

Environmental history has been an independent discipline since the 1970s. The roots of environmental history stem from various disciplines, including geography, the natural sciences, ecology, geology, anthropology and history.¹⁹ Scholars generally agree that the origins of environmental history can be traced to the United States, from where it spread to Europe.²⁰ Whilst it is true that most environmental history research has been carried out in North America, the Finnish environmental historian Timo Myllyntaus argues that Finnish environmental history has a long and independent tradition as well. He divides this tradition into three phases: an embryonic period from the eighteenth century to the mid-twentieth century; a formative phase from the 1950s until the early 1970s and a current stage from the mid-1970s up to the present. Major research themes related to the embryonic period include the climate, forests, water resources and landscapes. Myllyntaus also mentions that, the Finnish professor of economic geography, Ilmari Hustisch, arranged a series of lectures in the end of the 1950s on a theme based on “Man’s Role in Changing the Face of the Earth” symposium that had been held in 1955 in the United States. In short, a new kind of historical research was being conducted at the time in Finland.²¹ A good overview on Finnish environmental history research is presented in *Encountering the Past in Nature* (2001) edited by Myllyntaus and Mikko Saikku.

Myllyntaus also states that even though two-way interactions between society and nature have been present in various works in both Finnish and Scandinavian history for a long time, such an approach has often been strongly anthropocentric. Some evidence exists to suggest that peasants as well as scholars have understood the importance of nature and have placed an emphasis on the responsibility of humans to take care of it.²² I studied these themes in my licentiate thesis, *Suomalaisen metsäluonnon lukemisen historiaa. Ihmisen ja koivun muuttuva suhde 1730-luvulta 1930-luvulle* (hereafter *Suomalaisen metsäluonnon lukemisen historiaa*) in 2005. I demonstrated that long-held accusations against the careless wood consumption of peasants were a groundless myth. The starting point of this myth can be traced back to the seventeenth century when Swedish mine owners, who were also

¹⁸ Worster, “The Wealth of Nature,” 20.

¹⁹ Sörlin and Warde, “Making the Environmental Historical,” 4.

²⁰ See, for example: Sörlin and Warde, “Making the Environmental Historical,” 2, 4-5; Grove, “Environmental History,” 262; Nash, *American Environmentalism*, 6-8.

²¹ Myllyntaus, “Old Wine in New Bottles?,” 180.

²² Myllyntaus, “Old Wine in New Bottles?,” 178, 193.

members of the ruling nobility, feared that they would not have enough fire-wood and timber for their mines and foundries. Hence, they began to accuse peasants of being careless in their use of timber. However, I provided a great deal of evidence that demonstrated that peasants took good care of forests, because they wanted to leave trees and fields in good condition for their descendants.²³ The themes that connect my licentiate and doctoral thesis are environmental history and the concept of environmental literacy. In my doctoral thesis, I study the conservational philosophy of a member of the nobility who lived in the nineteenth century. Nordenskiöld was of the opinion that forests should be preserved for the sake of their beauty and as a repository of hidden history. His reasoning was both aesthetic and ethical.

Mining is considered to be an interesting subject in environmental history studies. In the case of the above-mentioned timber problem of the mine owners, there were also some environmental problems, which the mine owners did not recognize. Heaps of solid waste were piled up near the mine entrance, for example, which resulted in effluent water running into nearby streams and rivers. Smelting also intensified air pollution, with waste gases adding an especially toxic element that was detrimental to most forms of life.²⁴ It should be noted that also Nordenskiöld, being a geologist, never criticized environmental problems produced as a consequence of mining. He did not write about the exploitation of natural resources or waste material in the vicinity of mines. These did not become environmental problems until in the twentieth century.

According to Myllyntaus, environmental history is a complex and attractive discipline. It demands lengthy research periods, a broad geographical scope, trans-disciplinary interaction, problem orientation and the ability to undertake innovative reassessments.²⁵ Today branches of environmental history are widespread in academia and beyond. The study of animals and consumption marks a new trend within the discipline. Many Nordic environmental historians, such as the Finn Laura Hollsten, the Swedes Lars J. Lundgren and Sverker Sörlin, alongside the British academic Paul Warde, consider that the multitude of possibilities within the study of environmental history offer a horizontal panorama rather than a specific view. Hollsten warns environmental historians not to fall into pessimism, despite the environmental history of the world being a long list of misfortunes and catastrophes: deforestation, desertification and the extinction of plant and animal species. At the same time, human beings form part of an ecosystem and are cultural creatures who are capable of destroying their environment. Yet, they can also adjust their relationship to their surrounding environment through choices, technology, imagination and intelligence.²⁶ Sörlin and Warde crystallize the idea of environmental history as a bridge builder between the humanities and other disciplines. It brings together facts from a wide range of disciplines, provides social relevance at a time of environmental crisis and develops a compelling narrative that is the hallmark of historical scholarship.²⁷ Lundgren considers

²³ Niemi, *Suomalaisen metsäluonnon lukemisen historiaa*, 183.

²⁴ Simmons, *Global Environmental History*, 81-2.

²⁵ Myllyntaus, "Environment in Explaining History," 154-5.

²⁶ Hollsten, "Miljöhistorien," 96-8.

²⁷ Sörlin and Wade, "Making the Environment," 11.

that most researchers integrate different factors and phenomena when considering the use of natural resources and environmental effects.²⁸

Worster introduced a three-level system into environmental history studies. The first level deals with understanding nature itself, in terms of how it was organized and functioned in the past. For example, fossils enabled Nordenskiöld to better understand the systems of nature and their functions in previous geological periods.²⁹ The second level incorporates the socioeconomic realm as it interacts with the environment: with tools and work, with the social relations that grow out of that work and with the various modes devised by people to produce goods from natural resources. Nordenskiöld undertook his expeditions during a period of technological, economic and environmental change, when whaling and hunting were being transformed from small-scale enterprises into a large fishing industry. Vessels grew in size and equipment diversified, as the number of creatures that were hunted increased. The inevitable consequence of this was a significant reduction in maritime stocks. Nordenskiöld reported on these changes and suggested solutions regarding how to remedy or prevent damage caused by these alterations to the natural environment. The third level outlined by Worster concerns perceptions, ethics, laws, myths and other structures of meaning that form the dialogue of an individual or group with nature.³⁰ Alongside Worster, Lundgren and Douglas Weiner argue that the power to make decisions, environmental or otherwise, is seldom distributed equally within a society. Thus, these issues often cause political conflict.³¹ The content of Nordenskiöld's "Förslag" became a long-standing contentious issue within the ruling social and political class in Finland. After a considerable amount of time, Finnish society was ready to make new types of decision.

In recent years, individuals have received increased attention within the field of environmental history, for example with biographies of George Perkins Marsh, John Wesley Powell, John Muir and Aldo Leopold. In Finland, Leena Rossi's doctoral thesis from 2016 concentrates on painter Frans Lind's relationship with environmental. According to Rossi, the relationship of every individual with her/his environment is worthy of study.³²

Individuals are in continuous contact with the environment and with the community in which they live. My study on the ideas and actions of Nordenskiöld will examine the influences he absorbed from his family, his education and his social connections.³³ With a knowledge of his attitudes, values and ideas regarding nature in the nineteenth century, we can explain some components of the history of conservation and are able to discern a line of progression in environmental history. The welfare of the environment depends on the personal decisions of every human being. In studying Nordenskiöld's observations and decisions, I discuss the motives that still affect the way in which people treat the environment.

²⁸ Lundgren, "Vad är miljöhistoria?," 214.

²⁹ Nordenskiöld's letter to Nils Gustaf Nordenskiöld, Sept. 9, 1858 in the Frugård Archiv, the National Library of Finland, Helsinki.

³⁰ Worster, "Doing Environmental History," 293.

³¹ Lundgren, "Vad är miljöhistoria?," 208; Weiner, "Death-Defying Attempt," 416; Worster, "Doing Environmental History," 293.

³² Rossi, "Yksilö ja ympäristö," 237.

³³ Roiko-Jokela, "Elämäkerta," 210-20.

It would also be interesting to compare the environmental relationships of different people. An informative study, for example, would be a comparative analysis of Nordenskiöld and the above-mentioned John Wesley Powell. Nordenskiöld undertook surveys of Spitsbergen, Greenland and the Northern coast of Asia between 1858 and 1883. Later in life, he amassed a large collection of historical maps. Powell made two explorations to the Colorado River and its canyons in 1868 and 1871-1872, and, as second director of the US Geological Survey, initiated the national mapping program. Both men were stubborn. They did not believe, for example, in the prevalent preconceptions of impossible deeds. Moreover, they both displayed a fiery interest in solving scientific problems and gathering new knowledge from unknown territories. However, one can also discern differences in their characters, such as in how to carry out scientific expeditions, as well as who to take with them, and how to report their scientific results to the scientific community and/or general public. There would potentially be interesting similarities and differences in their views of the environment.

The Principal Theme: Environmental Literacy

Roth divided environmental literacy into three levels: nominal, functional and operational. I argue, according to Roth's division, that Nordenskiöld had the "ability to recognize many of the basic terms used in communicating about the environment and to provide rough, if unsophisticated, working definitions of their meanings." These are characteristics of the nominal level. He also had "a broader knowledge and understanding of the nature and interactions between human social systems and other natural systems," which are indications of the functional level. Furthermore, he showed "progress beyond functional literacy in both the breadth and depth of understandings and skills," as a person who had reached the operational level.³⁴

In *A Primer for Environmental Literacy*, the American ecologist Frank B. Golley defines environmental literacy as "information on the natural and built environments" that can be provided "in a form that will give general reader an organized way to think about environment."³⁵ Experience is the trigger for environmental literacy. One must go out and perceive, feel, taste and experience one's surroundings in order to attain a growing understanding of nature. Nordenskiöld did precisely such a thing in the Arctic. In addition to Golley, also Professor of Environmental Studies David W. Orr in his book *Ecological Literacy. Education and the Transition to a Postmodern World* (1992) emphasizes the need to experience the landscape via all the senses. Such an approach enables a feeling of place to develop that can distinguish each site and makes a place special and memorable.³⁶ Nordenskiöld felt the Arctic with all his senses and in his accounts of his expeditions it is as though we too can see, hear and smell the polar environment. He also felt that the nature of the Nordic countries was worthy of preservation for future generations.

The ability to inquire and ask questions is the starting point in an analysis of environmental problems. Orr refers to Rachel Carson, who published the groundbreaking book *Silent Spring* in 1962. She had the ability to think broadly, to be aware of what is linked to what and to think beyond conventional categories. In short, she displayed some characteristics of environmental literacy. Rachel Carson was thinking in an ecolate manner by inquiring about the relationship between chlorinated hydrocarbon pesticides and bird populations. She had some direct knowledge of farms and farming practices, as well as a comprehension of ornithology. Orr states: "To think in ecolate fashion presumes a breadth of experience with healthy natural systems, both of which are increasingly rare. It also presumes that the persons be willing and able to 'think at right angles' to their particular specializations, as Aldo Leopold has put it."³⁷ Nordenskiöld made observations on the destruction in the Arctic nature, such as unnecessary killing and exploitation of walrus and eiders and wrote about them in his books and reports and also made suggestions for bettering the state of affairs.

³⁴ Roth, *Environmental Literacy: Its Roots*, 4.

³⁵ Golley, *Primer for Environmental Literacy*, ix-xi.

³⁶ Golley, *Primer for Environmental Literacy*, ix.; Orr, *Ecological Literacy*, ix.

³⁷ Orr, *Ecological Literacy*, 87.

I consider the concept of environmental literacy as something that can be understood within the wider context of spontaneous developments that occur from an early age under the guidance of capable peers. A person adapts his/her way of thinking, knowledge, experiences, and understanding of the environment, as well as his/her attitudes and values towards the environment as part of a long interaction with his/her family, community and society. I think that environmental literacy provides a link to the ancient roots of humanity. Environmental literacy helps people cope with the environment, to survive and to protect sustainable resources. People read their environment in different ways in different cultures. The livelihood of ancient hunter-gatherer cultures depended on accurate knowledge of the surrounding environment. Their basic ecological elements were mobility and flexibility. People were directly integrated into nature and they lived simultaneously with a natural sense of time. Extensive and versatile possibilities to exploit the environment were available. They used their environmental literacy in order to eliminate the ecological crises that had been caused by variations in flora and fauna. Their ecological security depended on the stability of their environment. Human beings and nature enjoyed a reciprocal connection.³⁸ Sometimes these efforts resulted in ecological catastrophes, such as deforestation, desertification and the extinction of animal species. However, I think that without environmental literacy humankind would have vanished from the earth a long time ago.

We can learn environmental literacy at school, college, university and in other institutes. The North American Association for Environmental Education (NAAEE) started a program in 1993 *Leading the Way to Environmental Literacy and Quality: National Guidelines for Environmental Education* with the goal of Environmentally Literate Citizenry. What is more, the Canadian Environmental Literacy Project (CELP) began in 2003.³⁹ The goal of environmental education is to raise citizens who are aware of ethical environmental issues and, who maintain ecological and sustainable values in their lives. It also aims to encourage people to act on behalf of these values.

Environmental literacy is almost an unknown term in Finland, and the country has no such organized programs for environmental education, unlike the USA and Canada. Nevertheless, environmental awareness has been a common subject in Finland at every stage of enculturation and education for decades. The Finnish social scientist Hanna Nordström thinks that we should concentrate on values and feelings in the environmental education, since the former provide the base for all our activities and the latter steer their formation. In other words, we need to advance a strategy that promotes ethical, biological, social and aesthetic values, such as respect for life, empathy, solidarity, justice, self-fulfilment and active involvement.⁴⁰

We can compare our own familiar environment with our native language. We learn our language within a certain time period; we know it well, and it is easy to use one's native language. Similarly, in a familiar environment we are able to easily notice changes and, if we are environmentally literate, we can interpret and correspond with the signals that we

³⁸ Sarmela, *Suomen perinneatlas*, 14-21.

³⁹ McCrea, *Leading the Way to Environmental Literacy*.

⁴⁰ Nordström, "Ympäristökasvatuksen," 136.

notice. A strange environment is like an unknown foreign language; it takes time to comprehend it and to learn to read its signs. On the other hand, if a faraway environment reminds us of our own environment, we can potentially interpret the signals from this remote place as easily as signals of from our home environment. Thus, a definition of environmental history could be following: environment + language + time = environmental history. Furthermore, environmental literacy can be defined in the following manner: environment + literacy (reading + written language) + time = environmental literacy.

The concept of environmental literacy provides a framework within which I situate my analysis of Nordenskiöld's observations and recommendations on nature. More specifically, I focus on his observations and recommendations regarding the Arctic environment: local fauna, its fragile and slowly recovering ecosystem. The constituent source of my analysis is his essay "Förslag," in which he expressed his wish that the northern forests and landscapes should be preserved for future generations as national parks.

History of Early Nordic Conservation

The notion of ‘conservation’ in my dissertation encapsulates the need to protect and preserve the environment on a very basic level. One of the first people to use the term ‘conservation’ was the American forester and politician Giffort Pinchot in 1907.⁴¹ The term was unfamiliar to Nordenskiöld. Indeed, the longstanding debate regarding the differences between ‘conservation’ and ‘preservation’ took place after his death. He used words such as ‘*bevara*’ (to keep, retain, maintain, conserve, preserve), ‘*fridlysa*,’ ‘*fredas*’ (to protect, place under protection), ‘*skydda*’ (to protect, guard, shelter, secure). In terms of destruction in nature, he used words such as ‘*utrotningskrig*’ (a war of extinction, a war of devastation, ravage), ‘*utdöda*’ (to exterminate), ‘*plundring*’ (a war of extermination). However, since the word conservation is commonly used in contemporary texts, I use it in line with the history of conservation. It should be noted that Nordenskiöld did not use the term ‘*national park*’. He used the word ‘*rikspark*’ (‘nation’s park’), but I use the term ‘national park’ in this study, since the term is idiomatic.

Historical studies of Nordic conservation in the last half of the nineteenth century are scarce, with most studies on the subject being limited to the twentieth century.⁴² The number of texts on conservation in its entirety is considerable. The majority of scholarship on conservation and environmental history emanated from either the United States or Britain. A great deal of writing on the subject hails from the Nordic countries, but the readership of these texts is limited. In Finland, for example, Rolf Palmgren published *Naturskydd och kultur* (Conservation and Culture) in the 1920s. In Denmark, Flemming Kiilsgaard Madsen’s *Naturfredningssagens historie i Danmark* (The History of Conservation in Denmark) was published in 1979.

Researchers have discussed the primary forces for instigating ideas related to the conservation of the natural environment. They often provide a mixture of concepts, attitudes, ideas and opinions. In her book *Skydda vår natur! Svenska Naturskyddsföreningens framväxt och tidig utveckling* (1987), for example, Desiree Haraldson mentions that hunting, the natural sciences, forestry, tourism, outdoor life and aesthetic-cultural interests were the triggers that led to the development of conservation as a goal in Nordic countries. In his book *Staten och naturen. Naturskyddspolitik i Sverige 1869-1935* (2009), Lundgren outlines two historical approaches: the conservation of areas and the protection of species. In his essay “Från riksparker till bygdemuseum. Om djurskydds-, naturskydds- och hembygdsrörelsen i sekelskiftets Sverige” (1981), Bo Sundin names another two historical approaches. One method stemmed from scientific interests and another emerged from the animal protection movement.⁴³ In his report on Swedish conservation efforts, expressed in 1907, Sundin names six motives: 1) economical, 2) scientific, 3) aesthetic, 4) historical, 5) cultural, and 6) national. Sundin argues that patriotism was a strong factor behind the Swedish conservation

⁴¹ Stoll, “Sagacious,” 26.

⁴² See, for example Hakala and Välimäki, *Ympäristön tila ja suojelu Suomessa*, 28; Lukkarinen, “Kansallisen maiseman,” 75; Perttula, *Suomen kansallispuistojärjestelmän*, 15; Wramner & Nygård, *Från naturskydd*, 15.

⁴³ Haraldsson, *Skydda vår natur*, 215-6; Lundgren, *Staten och naturen*, 25; Nash, *American Environmentalism*, 52-8; Sundin, “Från riksparker till bygdemuseum,” 153.

movement since the unity of Swedish people and Swedish nature was considered essential. Moors, forests and various natural wonders became national symbols.⁴⁴ In Sundin's analysis, Nordenskiöld embodies a modern scientist whose reasons for advocating nature conservation were rooted in his background in geology and biology. I argue that Nordenskiöld's motives were not scientific but aesthetic, historical, cultural and national in spirit. He wanted to preserve for future generations the beauty of landscapes and the history hidden in forests. He does not focus on Swedish or Finnish nature in particular, but rather emphasizes Nordic nature. In all likelihood, he probably felt himself to be a citizen of both countries.

Historians have divided the history of Nordic conservation into different periods. Elow Söderberg refers to the time before 1909 as the preliminary period of conservation in the area. Up until 1909, the exploitation and pollution of the natural environment (particularly water) went on unheeded. In 1909, Sweden introduced legislation regarding conservation. In the same year, The Swedish Society for Nature Conservation and the first national parks in the country were founded. This second stage in the history of Swedish conservation extended to the beginning of the 1960s.⁴⁵

In Finland, the ecologists Pekka Borg and Hannu Ormio have divided the history of Finnish national parks into three eras: 1) the era of natural romanticism from 1800 until the 1880s; 2) the age of planning and building the national park system from the 1880s until the 1950s and 3) the era of the organized national park system from the 1960s.⁴⁶ The Finnish geographer Ailla-Maria Arajärvi divides the history of conservation into three stages: 1) the stage of classical conservation at the turn of the twentieth century, which was marked by small-scale isolated reserves and natural monuments that were earmarked as samples of nature's most outstanding features; 2) the stage of active conservation after World War II, which stressed the management of nature reserves and 3) the stage of expansive conservation, which began in the 1960s as a result of increased awareness of environmental issues.⁴⁷ I would combine the classifications of Borg and Oramo with that of Arajärvi in order to come up with a five-fold division of the history of conservation in Finland: 1) the era of natural romanticism between 1800 and the 1880s; 2) classical conservation from 1880s to the 1920s; 3) organized conservation from the 1920s to the 1940s; 4) active conservation from the 1950s to the 1960s and 5) expansive conservation from the 1960s onwards. I agree with the parameters of Borg and Oramo's first period. My second period of classical conservation, which Arajärvi calls her first period, begins when the Finnish foresters adopted Nordenskiöld's proposal at a meeting in 1881. This period continued until the 1920s. During the third stage, the first conservational law was enacted in 1928 and the first national parks and the Finnish Conservation Society were founded in 1938.⁴⁸ My fourth and fifth periods are identical to the second and third categories outlined by Arajärvi.

⁴⁴ Sundin, "Environmental Protection," 201-2

⁴⁵ Söderberg, *Miljövärdet*, 3.

⁴⁶ Borg and Ormio, *Perustiedot kansallispuistoista*, 42.

⁴⁷ Arajärvi, *Luonnonsuojelun*, 5.

⁴⁸ Laakkonen, *Harmaat aallot*, 7-8.

Many researchers have referred to Nordenskiöld as a pioneer who started a conversation in Nordic countries about conservation.⁴⁹ The Finnish historian Mika Pekurinen, for example, argues that Nordenskiöld's "Förslag" moved Finnish conservation into a new era. Consequently, debate about the value of single tourist attractions disappeared from the discussion about conservation. Instead, the protection of large areas of pristine nature in national parks and nature reserves began to be seen as an important issue.⁵⁰ Minttu Perttula, a researcher at the State Forest Enterprise in Finland, also refers to Nordenskiöld as the pioneer of conservation ideology in Finland. In Perttula's opinion, he raised the natural environment to the status of being a national treasure as was already the case with cultural heritage.⁵¹ Furthermore, in 2000 Timo Vuorisalo and Pasi Laihonen refer to "the growing interest towards conservation issues among biology and forestry professionals, inspired by an article published by A. E. Nordenskiöld".⁵² Nordenskiöld launched the ideology of conservation in Finland and Sweden in 1880. Several decades passed before his proposal was enacted in full in the conservation and environmental protection policy that we enjoy today. Irrespective of this delay, he is undoubtedly one prominent individual in the history of Nordic conservation.

⁴⁹ See, for example: Haapanen, "Koillismaan luonnonsuojelu 90 vuotta," 35; Hakala and Välimäki, *Ympäristön tila ja suojelu Suomessa*, 28; Haraldsson, *Skydda vår natur*, 75; Häggman, "Kansallismaiseman hoitajat," 193; Lindgren, "Nils Adolf Erik Nordenskiöld," 7; Mäkelä, "Koskemattoman luonnon näyteikkunat," 230; Myllyntaus, "Suomalaisen ympäristöhistorian kehityslinjoja," 327; Sehlin, *Känn ditt land*, 41; Sundin, "Environmental Protection," 200; Vuorisalo and Laihonen, "Biodiversity conservation in the north," 281; Wramner and Nygård, *Från naturskydd*, 15;

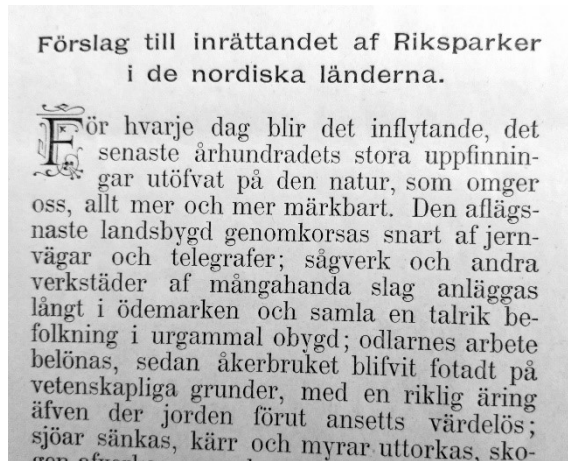
⁵⁰ Pekurinen, "Sivistys velvoittaa," 130.

⁵¹ Perttula, *Suomen kansallispuistojärjestelmän*, 15.

⁵² Vuorisalo and Laihonen, "Biodiversity Conservation in the North," 281.

Sources

When I started my project on Nordenskiöld, I presumed that his writings, documents and correspondence would yield abundant evidence of his environmentally literate opinions in the same way as they are visible in “Förslag.” My presumption was correct, but his opinions were scattered throughout his writings. This ensured that my research was a rather laborious process.



PICTURE 2. Nordenskiöld's “Förslag” was the starting point for my study.



PICTURE 3. “Förslag” was published in *Per Brahes Minne (The Memory of Per Brahe)*, a bicentennial volume in honour of Per Brahe (1602-1680), a seventeenth-century governor-general of Finland.⁵³

⁵³ Finland was part of Sweden from 1155 to 1809. The Governor General represented the king of Sweden in Finland. Count Per Brahe won great favour among the Finnish people and he remains fondly remembered. The proceeds from the sale of the 16-page publication were used to finance a statue of the count. Today, the statue



PICTURE 4. “Förslag” covers less than half of a folio page.

As with the other texts in the booklet, “Förslag” is quite short. It covers less than half of a folio page. However, the substance of the essay has affected subsequent generations in the history of Nordic conservation. It begins with the following words:

The accumulated influence of the great inventions of the last century on the nature around us is becoming increasingly evident by day. The farthermost countryside will soon be crisscrossed by railways and telegraph lines. Sawmills and other kinds of mills are located deep in the wilderness and many people have gathered there in the backwoods [...] The transition brings happiness and welfare for millions and demonstrates the true measure of a country’s development [...] But, at the same time, there is a melancholy feeling that future generations will barely be able to imagine what the land of their fathers was like.⁵⁴

⁵⁴ Nordenskiöld, “Förslag,” 10. The original text reads: “För varje dag blir det inflytande, det senaste århundradets stora uppfinningar utöfvat på den natur, som omger oss, allt mer och mer märkbart. Den aflägsnaste landsbygd genomkorsas snart af järnvägar och telegrafer; sågverk och andra verkstäder af mångahanda slag anläggas långt in i ödemarken [...] Förändringen medför lycka och välstånd för millioner och utgör den rätta måttstocken på ett lands utveckling [...] Men det ligger derjemte något nedtryckande i känslan

stands in a city park in Turku, the oldest town in Finland, next to the monumental cathedral.

Nordenskiöld understood that industrial progress was unavoidable and even economically beneficial. This highlights one of the principal contradictions in his worldview. At one and the same time he was worried about the loss of pristine nature yet shared the utilitarian and modern idea of continuous progress. He saw how infrastructure and modern means of communication extended to far-away regions. However, he also understood that all progress did not necessarily mean good progress. Indeed, he understood that progress may entail a heavy natural toll. In his text, Nordenskiöld proposed the following:

There are extensive areas of publicly owned land in the Nordic countries, many of which yield insignificant or no profit. There would be no significant sacrifice involved in giving over a suitable tract that could be marked out and proclaimed a Nation's park (= Rikspark).⁵⁵

This proposal encouraged his contemporaries to work towards the realization of national parks in Nordic countries. When the first parks were established in Sweden in 1909, they were opened in places that yielded insignificant profit as Nordenskiöld had suggested. His foresight vis-à-vis the creation of national parks reflect his environmental literacy.

“Förslag” is Nordenskiöld's sole reference to national parks. The subject of forests, however, is present in some of his other writings. In *Voyage of the Vega*, for example, he compared the northernmost forests in Siberia and Norway. In Siberia, forests grow further north than in Norway. According to Nordenskiöld this can be explained by the spring floods in Siberian rivers, which bring huge quantities of warm water that are filled with seeds and fruitful soil from the south. In Norway, the ground is mostly bold granite and gneiss rock or fruitless sandy till. Even the appearance of the forests is different. In Siberia the outermost trees are gnarled and half-withered larches (*Larix gmelinii*), which stick out over the tops of the hills like thin grey brushes. In Norway, the forests consist of scraggy birches, which clothe the mountain sides in a very lively green hue.⁵⁶

Johan Markus Hulth listed 178 items in *Nordenskiölds-bibliografi* in 1902. In addition to the accounts of his expeditions, Nordenskiöld wrote about mineralogy, geology, chemistry, cartography and other scientific fields. Hulth named almost 300 translations, summaries, references and alike. In the beginning of his career, Nordenskiöld's interests were primarily related to mineralogy and geology. When he began his expeditions, he wrote mostly about his experiences. When he stopped undertaking expeditions he began to write about cartography. He published two large volumes on cartography: *Facsimile-atlas till kartografiens äldsta historia* (Facsimile-atlas to the early history of cartography) in 1889 and *Periplus* in 1897.⁵⁷

Most of Nordenskiöld's letters, journals, notebooks, log books, drawings, photographs, maps and other documents are stored in the Centre for History of Science at

att våra efterkommande knappast skola kunna göra sig en tydlig föreställning om deras fäders land.”

⁵⁵ Nordenskiöld, “Förslag,” 10. The original text reads: “Nordens länder ega vidsträckta områden kronojord. Mångenstädes lemnar denna föga eller ingen afkastning och utan nämnvärd uppoffring kunde därför en lämplig sträck utväljas och förklaras för Rikspark.”

⁵⁶ Nordenskiöld, *Voyage of Vega I*, 43-4.

⁵⁷ Hult, *Nordenskiölds -bibliografi*.

the Royal Swedish Academy of Sciences in Stockholm. The collection of letters comprises roughly 15,000 items from about 2,500 correspondents, among whom were emperors and kings, captains and admirals, scientists and researchers, business men, common people, relatives and friends.⁵⁸ His early correspondence, from 1848 to 1858, is stored in the National Library of Finland in Helsinki.⁵⁹ The unpublished material in these collections contains information relevant to environmental history, environmental literacy and conservation, although this subject matter is scattered in small pieces throughout documents.

Nordenskiöld's scientific library is one interesting aspect of unity among the sources.⁶⁰ He began to collect books and historical maps in growing numbers while he was preparing his memorandum for the North-east Passage expedition in 1877.⁶¹ At the beginning of my research, one of my ambitions was to trace individuals and texts that could have influenced Nordenskiöld in his environmental thinking. This is why I examined a number of the books in his library. Despite my considerable efforts, I found only one possible example: George Catlin's *Illustrations of the Manners, Customs, and Condition of the North American Indians*. In this book one can find some astonishingly similar ideas to those expressed by Nordenskiöld in "Förslag." I think they cannot be a coincidence. The other books contain various observations and descriptions on nature, but none of the authors express any concern about the destruction of nature or provide any solutions for remedying or preventing environmental damages.

One interesting find in Germany was Ernst Rudorff's article "Über das Verhältnis des modernen Lebens zur Natur" in the 1880 edition of *Preussische Jahrbücher*. Rudorff was an early promoter of conservation in Germany. His ideas are in some respect similar to those espoused by Nordenskiöld. Rudorff was worried about the impact of rail construction in the Rhineland, for example, as he feared it would destroy the beauty of the area that had been a popular tourist attraction since the end of the eighteenth century. He also referred to the picturesque and historical elements of the landscape in a similar manner to Nordenskiöld, but I have not found any direct connection between him and Nordenskiöld.

Nordenskiöld was well acquainted with the established authorities of Arctic expeditions, including Henry Hudson, William Barents and William Scoresby Junior, as well as with lesser known authors. The main interests of explorers from Britain, Germany and the United States were meteorological, hydrological and geographical issues. They made remarks on flora and fauna as well, but without any reference to environmental problems or

⁵⁸ Odelberg, "A. E. Nordenskiöld collection in Stockholm," 39.

⁵⁹ Family letters are stored in the Frugårds Archiv, The National Library of Finland in Helsinki.

⁶⁰ Nordenskiöld was an eager collector of historical books and maps. His scientific library was sold to the National Library of Finland after his death. The Nordenskiöld Collection contains geographical, and cartographical literature, as well as over 3,000 travel books. It also contains a unique collection of about 24,000 historical maps. Since 1997 it has been included among UNESCO's Memory of the World register. The maps are listed in an excellent printed catalogue in five volumes. The list of the books is only available in the electrical system of Helsinki University Library. A printed book would provide more convenient access for researchers into this rich and interesting collection.

⁶¹ Kish, *North-East Passage*, 496-7.

solutions to environmental problems.⁶² John Ross undertook an expedition in 1818, for example, with the goal of finding the Northwest Passage. He was also ordered to study “the geography and hydrography of the Arctic Regions, of which so little is hitherto known, and contribute to the advancement of science and natural knowledge.”⁶³ He and his companion, Captain Sabine from the British Royal Artillery, were keenly attentive to the variations and inclinations of the magnetic needle and the intensity of the magnetic force. They also recorded the temperature of the air and the surface of the sea and frequently tried the temperature of the sea, in various locations and at different depths. They also made observations about the ice, horizon, currents and other important phenomena for navigational purposes. They collected and preserved specimens of the animal, mineral, and vegetable kingdoms and made drawings and descriptions of the large animals.⁶⁴ Nordenskiöld’s views about Arctic environment are discussed in more detail in the articles “Exploring Environmental Literacy” and “Historical Roots.”

⁶² See, for example: Beechey, *Voyage to the Pacific and Bering’s strait*; Osborn, “Exploration of the North Polar Region”; Parry, “Three Voyages [...] a North-West Passage”; Payer, “Austro-Hungarian Polar Expedition”; Richards, “Towards the Pole”; Stone, “North West Passage.”

⁶³ Ross, *Voyage of Discovery*, 9.

⁶⁴ Ross, *Voyage of Discovery*, 9.

Adolf Erik Nordenskiöld:

An environmentally Literate Explorer

Adolf Erik Nordenskiöld was born in 1832 in Helsinki, the capital of the Russian Grand Duchy of Finland⁶⁵. His father, Nils Gustaf Nordenskiöld was the superintendent of the Finnish Mining Board and his mother, Sofia Margareta, came from the von Haartman family. Both families belonged to the small Swedish speaking upper class which ran the duchy.⁶⁶ When Adolf was in his teens, the family moved to Frugård, the country estate of the Nordenskiöld's family in Mäntsälä, in Southern Finland.⁶⁷

The history of Finland was familiar to Nordenskiöld. George Kish, an American geographer and cartographer, who wrote one of Nordenskiöld's biographies, considers that, as in many other aspects of his life, it was his father, who exerted a decisive influence that led to his interest in history and science.⁶⁸ In my article "Historical Roots," I present some other role models, such as the national poet of Finland, Johan Ludvig Runeberg and his friend, the author and historian Zacharias Topelius. From his peers, Nordenskiöld absorbed basic knowledge of nature and the history of his native country. These qualities are evident in "Förslag" in the following passages:

In the near future, which is probably not far distant, it might be difficult to fashion a complete picture of the nature against which our ancestors fought their first battles, which has in itself always encouraged Northerners in their never ending love of freedom, and fostered our courageous fighting troops, which formed the extensive museum in which all our researchers and painters began their studies, and which shapes the fundamental tone of our poets' songs, in our fathers' and in our own view of life.⁶⁹

An environmentally literate person understands how various environmental issues have come to pass. Nordenskiöld understood the difference between contemporary nature, which was in the process of being altered by modern inventions, and ancient nature "against which our ancestors fought" and which was "the extensive museum in which all our

⁶⁵ Finland became a part of the Russian Empire in 1809. Before that, Finland had been a part of Sweden for six hundred years.

⁶⁶ Kish, *North-East Passage*, 9-10. Three of the four estates in the Finnish parliament were represented by Swedish speakers. Niemi, *Suomalaisen metsäluonnon*, 27. Most Finns were members of lower social classes, such as the peasantry in the countryside or the urban common people in the few small towns. Only around two thousand people belonged to Finland's nobility, from a population of approximately one million. However, this small elite exerted a strong influence on Finland's cultural life and within the administration.

⁶⁷ Nils Gustaf Nordenskiöld's letter to his wife Sophia Nordenskiöld, Aug. 29, 1849 in the Frugårds Archiv, The National Library of Finland in Helsinki.

⁶⁸ Kish, *North-East Passage*, 496-7.

⁶⁹ Nordenskiöld, "Förslag", 10. The original text reads: "I en framtid, som sannolikt ej är långt aflägsen, skall det derför blifva svårt att få en fulltonig föreställning om den natur, med hvilken våra stamfäder hade att kämpa deras första strid, som närt nordbons aldrig kufvade frihetskärlek och fostrat dess djerfva krigarskaror, som utgjort det vidsträckta museum der alla våra forskare och konstnärer börjat sina studier, som bildar grundtonen i våra skalders sånger, i våra fäders och vår egen lifsåskådning."

researchers and painters began their studies.” Nordenskiöld understood “the unity of humankind with nature” that forms one of the basic tenets of the concept of environmental literacy.⁷⁰ It was also important to him that future generations should be given the chance to experience the history and beauty of the landscapes “of their fathers.” Sven Hedin has stated, that a true and genuine love for nature run like a red line through Nordenskiöld’s whole literary output.⁷¹

In his student years, Nordenskiöld studied chemistry, natural history, mathematics, and physics at the Imperial Alexander University of Helsinki. His subjects of choice were mineralogy and geology. He took part in organizational activities at the university. He was one of the leading figures among the liberal group of university students and was president of the Wiipurilainen Osakunta, a student fraternity.⁷² In the spring of 1853, he earned his bachelor’s degree and the following autumn he accompanied his father to the Urals on a mineralogical survey to inspect the iron and copper mines of Prince Paul Demidov. The mineral findings he made in Russia became important reference points in his scientific analyses.⁷³

Nils Gustaf and Adolf Erik Nordenskiöld are both respected figures in the history of geology. Indeed, a rare borate named ‘*nordenskiöldine*’ (a mixture of calcium and tin, $(\text{CaSn}(\text{BO}_3)_2)$) was named in honour of Adolf Erik. The mineral was found by the Norwegian Waldemar Christopher Brögger in southern Norway in 1887. The German mineralogist Gustav Adolph Kennigott also named one mineral ‘*nordenskiöldite*’ after Nils Gustav in 1854, but it never received independent status.⁷⁴

Siberia played a pivotal and long-lasting role in Nordenskiöld’s life. In the summer of 1854, after his visit to the Urals, he planned to undertake an exploration to East Siberia, but the Crimean War prevented this plan from coming to fruition. Two years later he applied for a scholarship from the Imperial Alexander University for a geological expedition to Siberia and to the Kamchatka Peninsula, but he did not receive any funds. After twenty years he finally succeeded in executing a successful exploration to the north coast of Asia and also undertook a survey of the Yenisei River in Siberia.⁷⁵

At the end of the 1850s, after his university studies, Nordenskiöld hoped to be nominated as the first professor in mineralogy and geology at the Imperial Alexander University. However, his life took a new direction when at his graduation dinner in May 1857, as the primus doctor, he delivered a speech that the Russian Governor-General of Finland, Count Fredrik Vilhelm von Berg, deemed to be politically too liberal-minded. Nordenskiöld was subsequently exiled from Finland. He found a new home in Stockholm, the capital of Sweden. In 1858, at the age of 26, he was appointed Director of the Mineralogical Department of the Swedish Museum of Natural History, and Professor of

⁷⁰ Disinger and Roth, *Environmental Literacy*, 4-5.

⁷¹ Hedin, *Adolf Erik Nordenskiöld*, 3.

⁷² Teperi, “Wiipurilainen osakunta,” 315, 335-6. Wiipurilainen Osakunta is the oldest of the 15 student associations at the University of Helsinki. The association was founded in 1653. Originally the student associations were founded to “keep an eye on the lively students.” <http://wiipurilainenosakunta.fi/english/>

⁷³ Nordenskiöld, *Nordenskiöld*, 10-2.

⁷⁴ Piispanen, *Etymologia Geoscientica*, 36.

⁷⁵ Nordenskiöld, *Nils Adolf Erik*, 10-1, 16.

Mineralogy at the Swedish Academy of Sciences. He held these positions for the rest of his life.

Nordenskiöld was prevented from travelling to Finland for several years after his exile. In 1860, for example, when his mother died, he was not permitted to attend the funeral. The same year he received Swedish citizenship. In 1861, when Count Berg ceased to be governor-general, Nordenskiöld was allowed to travel to Finland.⁷⁶ Yet, for the rest of his life Nordenskiöld's dream of returning to his native land was unfulfilled. In 1876, for example, he was uncertain as to whether he should continue his Arctic expeditions as a Swedish citizen, or whether he should return to his native country. His brother Otto warned him about the risks that would entail from any return: he would lose his chance to undertake Arctic expeditions. Otto advised him to profit from the possibility of Siberian commerce, after he twice successfully navigated the Yenisei River. Otto wrote that he could retire to Finland when he tired of expeditions.⁷⁷ But he never returned. Consequently, Nordenskiöld's national identity is somewhat liminal: in Finland he is perceived as a Finn and in Sweden as a Swede.

Over the course of twenty-five years, Nordenskiöld undertook ten Arctic expeditions and spent ten summers and two winters in the Arctic. He visited Spitsbergen five times (in 1858, 1861, 1864, 1868 and during the winter of 1872-1873), Greenland two times (in 1870 and 1883), the Yenisei River in Russia twice (in 1875 and 1876) and between 1878 and 1880 he navigated the Northeast Passage and sailed around Europe and Asia. On his first two voyages, the Swedish geologist Otto Torell was the commander.⁷⁸ The following eight expeditions were commanded by Nordenskiöld. The Swedish botanist Gunnar Andersson described Torell and Nordenskiöld as "the reformers of Arctic exploration."⁷⁹ Their pattern of comprehensive investigations eventually became the model for scientific Polar expeditions. However, after Nordenskiöld had married the Finnish-born Anna Mannerheim, in 1863, he wanted to give up his explorer career.⁸⁰ But his plans changed in the following March. His colleagues prepared to continue their scientific research in Spitsbergen, when the supposed leader of the expedition, Karl Chydenius, a Finnish physicist, unexpectedly died. Nordenskiöld was asked to take his place.⁸¹ He accepted the proposition, and after the 1864 year's expedition, he conducted seven more expeditions.

During his expeditions in 1868, 1870 and 1872-1873, Nordenskiöld wanted to find a way to the North Pole. At the time there were still four great polar quests that had not been achieved: 1) the North Pole; 2) the South Pole; 3) the Northeast Passage and 4) the Northwest

⁷⁶ Nordenskiöld, *Nordenskiöld*, 24.

⁷⁷ Otto Nordenskiöld's letter to Nordenskiöld, Jan. 28, 1876, in the Frugårds Archiv, The National Library of Finland in Helsinki.

⁷⁸ *Nordisk Familjebok* 29, 374-76: Otto Martin Torell (1828-1900) was a zoologist, geologist and polar explorer. Torell was the director of Swedish geological research from 1871 until 1897. He was the forerunner of Swedish polar expeditions and one of the first specialists of the geology of the Ice Age. During his expeditions to Switzerland (1856) and to Iceland (1857) he studied the function of glaciers in order to find out whether there had been an Ice Age in Scandinavia.

⁷⁹ Andersson, *A. E. Nordenskiöld*, 11.

⁸⁰ Kish, "Adolf Erik Nordenskiöld," 495; Ramsay, *Nordenskiöld, merenkulkija*, 125.

⁸¹ Kish, *North-East Passage*, 495; Nathorst, "A. E. Nordenskiöld's polarfärder," 142; Nordenskiöld, *Nils Adolf Erik Nordenskiöld*, 25-6.

Passage. In 1868, Nordenskiöld tried to find a way to the North Pole from Spitsbergen. In 1870, he assayed a route from Greenland and in 1872-1873 from Spitsbergen once again. However, various misfortunes befell the expeditions and he finally gave up. Instead, he switched his attention to navigating the Northeast Passage. In 1878, he succeeded in this attempt, and, thus, he managed to solve the first of the four great polar quests.

In recent years, the history of the Arctic has garnered an increasing amount of research from scholars in Nordic countries and elsewhere.⁸² However, these works only mention Nordenskiöld in passing. One exception is the work of John McCannon, who considers Nordenskiöld to be “[a] leading figure on the European side, and one of Arctic history’s undeservedly underappreciated characters.” McCannon also paid attention to some environmental facts, including how Nordenskiöld found one of the earliest proofs of the far-reaching environmental impact of industrial waste. In 1870, in Greenland “Nordenskiöld observed that the ice there was covered in many spots by a curious powdery substance that he named cryoconite” that “turned out to be the residue of coal dust and other particulates belched into the sky by foundries and furnaces far to the south.”⁸³ I discuss Nordenskiöld’s mineralogical and geological findings in more detail in my article “How Fossils” and also later in this chapter.

Nordenskiöld carried out all his expeditions under the Swedish flag. He considered that it was important that the Swedes should succeed in navigating the Northeast Passage. In 1868, he was already of the opinion that “only we [the Swedes] are able to equip a scientific expedition where every man, from the leader to the youngest seaman, is able to encounter calmly and with confidence the distress and dangers of the northern Arctic Sea with its severe climate and drift ice.”⁸⁴ His employers, the Swedish Academy of Sciences and the Swedish Museum of Natural History were closely connected to his expeditions.⁸⁵ The Academy also actively functioned as a lively forum for scientific debate and a coordinator of national scientific initiatives. At the turn of the nineteenth and twentieth centuries, the Academy continued Nordenskiöld’s legacy in conservation by playing an important role in the creation of Sweden’s national parks.⁸⁶

Nordenskiöld was a member or honorary member of dozens of national and international scientific societies. He was awarded various medals and other tributes. One of the first honours, the Founder’s Medal of the Royal Geographical Society, was presented to him after his 1868 expedition to Spitsbergen. He had penetrated further north than any man before aboard the steamship *Sophia*. At the society’s anniversary meeting, held on May 24,

⁸² Bravo and Sörlin, “Narrative and Practice,” 7. See, for example John McCannon’s *History of the Arctic: Nature, Exploration and Exploitation* (2012), David Thomas Murphy’s *German Exploration of the Polar World. A History 1870-1940* (2002), and Roland Huntford’s *Nansen. The Explorer as Hero* (2001). Some interesting articles has also been published, such as Tore Frängsmyr’s “Swedish Polar Exploration,” in *Science in Sweden. The Royal Swedish Academy of Sciences 1739-1989* (1989) and Michael Harbsmeier’s “Bodies and Voices from Ultima Thule” in *Narrating the Arctic. A Cultural History of Nordic Scientific Practices* (2002).

⁸³ McCannon, *History of the Arctic*, 167.

⁸⁴ Manuscript by Nordenskiöld, June 1868, *Om den under Professor A. E. Nordenskiölds ledning nyligen afgångna Svenska polarexpeditionen*, in Centre for the History of Science at the Royal Swedish Academy of Sciences in Stockholm, F02a:7.

⁸⁵ Nordenskiöld, *Nordenskiöld*, 10; Nordenskiöld, “Redogörelse [...] 1875,” 6-7.

⁸⁶ Frängsmyr, “Introduction,” 18.

1869, Sir Roderick I. Murchinson, the president of the society, summed up Nordenskiöld's achievements: an improvement in geographical knowledge of Spitsbergen and considerable additions within the zoological, botanical, geological and meteorological studies of the Arctic regions.⁸⁷ In the years to come, his path-breaking research in several fields of science substantially widened our knowledge of the Arctic.

Roth and Disinger regard developmental learning throughout the human life cycle as one of the basic issues from which environmental literacy derives its focus.⁸⁸ Nordenskiöld's environmental literacy developed in interaction with the physical environment and with other individuals. He adapted his way of thinking and experiencing his environment from his family, ancestors, colleagues and friends. He observed and experienced the nature of the Arctic on board ships, ferries, and boats, as well as on ice and on land. When on land, he usually walked by foot. During his expeditions, he sailed on various kinds of vessel. Some were just small fishing boats, whilst others were exclusively outfitted for Arctic explorations. According to Nordenskiöld, two significant agents were necessary for navigation in an icy sea: a steam engine and sufficient protection against icy conditions. He also knew, from experience, that even the strongest ship could be crushed if it accidentally happened upon two immense ice fields that were clashing.⁸⁹

Ice is one of the most crucial factors when seeking to explore the Arctic. Identification of the various shapes, movements and consistency of ice was crucial in order to survive. Nordenskiöld studied the development of icebergs, for example, and compiled a list of different forms of sea ice. He divided Arctic sea ice into six categories: 1) icebergs; 2) glacier ice-blocks; 3) pieces of ice from the ice-foot that forms along the seacoast or the banks of rivers; 4) river ice; 5) bay ice and 6) sea ice.⁹⁰ He divided glacial outlets into three categories: first thick ice-sheets that split up and break into icebergs of giant like dimensions. Second, broad glaciers that slowly advance over the sea with an even perpendicular face, from which considerable ice-blocks, but no true icebergs, occasionally fall down. Third, smaller glaciers that advance so slowly that the ice in the brim melts away as fast as the whole mass glides forward. These glaciers terminate at a beach with a long ice-slope covered with clay, sand, and gravel.⁹¹ Nordenskiöld published his findings in scientific books and journals in several countries and in many languages.

The examination of fossils was a relatively recent field of study in Nordenskiöld's era. The first petrifications in the Arctic were only discovered a few decades prior to his expeditions. Nordenskiöld compared the various sediments on the ground with evidence gleaned from the pages of books devoted to the geological history of the polar region. They reveal important and useful knowledge about the history of the Earth. He became highly skilled in locating the best places to find fossils.⁹² In my article "How Fossils," I analyse how fossils were of interest to Nordenskiöld and his father and were an important topic of

⁸⁷ Kish, "Adolf Erik Nordenskiöld," 487.

⁸⁸ Disinger and Roth, *Environmental Literacy*, 4-5.

⁸⁹ Nordenskiöld, *Den andra dicksonska expeditionen*, 18.

⁹⁰ Nordenskiöld, *Voyage of Vega I*, 422-6.

⁹¹ Nordenskiöld, *Voyage of Vega I*, 181.

⁹² Nordenskiöld, *Den andra dicksonska expeditionen*, 261-2; Nordenskiöld, *Spetsbergens geologi*, 33.

discussion in their correspondence. In 1858, Adolf wrote to his father and explained that fossils provided him with a means to better understand the systems of nature and its functions in previous geological periods.⁹³ He sent most of his fossil findings to the Swiss professor Oswald Heer. Heer's opinion was that Nordenskiöld's Arctic fossil findings significantly widened the scope of our knowledge of the past.⁹⁴ In a debate about glacial in *Geological Magazine* in 1875, Nordenskiöld was referred to in regards to his work on fossils.⁹⁵ He was also involved in the debate about the properties of kryokonite, which he had discovered with Sven Berggren during their trip to the Greenland ice cap in 1870. They first observed the brown multicellular alga substance partly on the ice and partly among fine gravel. He named this dust 'kryokonite,' (ice dust). Nordenskiöld deduced that kryokonite is the worst enemy of ice caps. The dark mass absorbs a much larger amount of the sun's warming rays than the white ice and burrows deep holes all over the ice, which accelerates the melting process.⁹⁶

Meteorites and cosmic dust, which fall to the surface of the earth, were among Nordenskiöld's geological interests.⁹⁷ On the west coast of Disko Island, during his first expedition to Greenland in 1870, he saw a group of huge stones, which he presumed were meteorites. The following year, three stones were delivered to Sweden. The largest is still on display in front of the National Museum of Natural History. He arranged for the two smaller stones to be delivered to Copenhagen and Helsinki. Both are on display to this day.⁹⁸ During the Vega expedition, near Cape Chelyuskin, he found small yellow specks in the snow, which proved to be crystallised grains of sand. He had earlier found similar small black metallic particles containing iron, cobalt and nickel. He considered this dust to be of cosmic origin. He calculated that the quantity of this kind of dust that was dispersed around the planet would range 0.1 to 1 milligramme per square metre per year. Thus, there could be up to five hundred million kilogrammes of the substance across the whole globe. Such a mass must play a significant role in the geological history of the globe. Nordenskiöld later wrote an article on the subject, entitled "Om den geologiska betydelsen af kosmiska ämnens nedfallande till jordytan särskildt med afseende på den Kant-Laplace'ska teorien."⁹⁹

The cosmic dust theory, as with some other ideas and hypotheses advanced by Nordenskiöld, were not accepted by contemporary scholars. But, in time, some of his theories have turned out to be worthy of further development, such as the origin and composition of kryokonite, which is today called cryoconite. Several studies have been made on the subject.¹⁰⁰ In general, he was a sharp-eyed and distinguished geologist, though he left

⁹³ Nordenskiöld's letter to Nils Gustaf Nordenskiöld, September 9, 1858, in the Frugård Archiv, the National Library of Finland, Helsinki.

⁹⁴ Heer, *Die schwedischen Expeditionen*, 41-2, 44-5; Heer, *Flora fossilis arctica*, 1.

⁹⁵ Hutton, "Cold of Glacial Epoch," 580-3.

⁹⁶ Nordenskiöld, "Grönland 1870," 998-9; Nordenskiöld, "Nordenskiöld Greenland Expedition," 10-3, and 39-42, 40.

⁹⁷ Nordenskiöld, *Voyage of Vega I*, 324-31.

⁹⁸ Kish, *North-East Passage*, 92; Ramsay, *Nordenskiöld merenkulkija*, 130-1.

⁹⁹ Nordenskiöld, "Om kosmiska ämnens nedfallande," 127-227.

¹⁰⁰ Andersson, *A. E. Nordenskiöld*, 13. On cryoconite, see for example: Fountain et al., "Temporal Variations in Physical and Chemical Features of Cryoconite Holes,"; Fountain et al, "Evolution of Cryoconite Holes," 35-45; Wharton et al., "Cryoconite Holes on Galdiers," 499-503.

no significant imprint in Swedish or Finnish geology.¹⁰¹ Nordenskiöld was easily roused and always ready to try new creative ideas. Intuition was his guiding star. It helped him to consider possibilities when others saw only failure: “you will see that everything will turn out well in the end,” was one of his favourite expressions.¹⁰²

Nordenskiöld met various indigenous people during his expeditions. He seems to have ignored their skills in understanding natural phenomena. For example, he never discussed the ways in which the Chukchis on the north-eastern coast of Asia, with whom he was in contact during the winter stay of the *Vega*, perceived their environment. To him, they were just ethnographic objects of study. He met them as a European “white man of the nineteenth century,” who held western attitudes and values. He called the native inhabitants either Chukchies, indigenous people, inhabitants of the country, men, women, wives, children, girls and boys or even creatures, folk and savages. Nevertheless, the history, physiology, culture, language and artefacts of the Chukchies interested him and his colleagues and they made notes about their dresses, way of life, appearance, equipment and weapons.¹⁰³ Nordenskiöld enforced strict rules when interacting with the Chukchies. He was adamant that nobody in his party collect objects for his own private use. Everything had to be under strict scientific control.¹⁰⁴ However, scientific fieldwork was not always performed in an ethical way. On one occasion, for example, the skull of a buried body was shamelessly transported to Sweden for further scientific research.¹⁰⁵

Some remains of old places of tents on the shore of the Chukchi Sea reminded Nordenskiöld of the site of a house that he had seen at the base of Jacobshaven ice-fjord in north-western Greenland. The house had been abandoned one or two centuries earlier, but sharply defined footprints could still be seen moving away from the ruin in different directions. Therefore, Nordenskiöld thought that the encampments in the vicinity of their anchorage in Siberia were older than they would be inclined to think when they first observed them. The harsh quality of the Arctic climate preserves remains surprisingly well over the course of time. This means that the impact of humans remains in the nature of the Arctic region much longer than in warmer regions.¹⁰⁶

Nordenskiöld’s observations and experience of nature also had practical consequences. His observations about how floating drift ice was able to calm stormy seas and therefore facilitated safe sailing conditions within or behind the ice, led him to come up with the idea of floating breakwaters.¹⁰⁷ When he saw that the ice in the Arctic Ocean in the summer was very weak, he concluded that a powerful steamer could easily break through it. This finding led to another technological innovation: the ice-breaker.¹⁰⁸ The invention of

¹⁰¹ Ramsay, *Nordenskiöld, merenkulkija*, 124.

¹⁰² Miekkaavaara, “Nordenskiöld Jäämerellä,” 108; Beckman, *Minnesbilder*, 23-5; Nordenskiöld, *Voyage of Vega 1*, 25.

¹⁰³ Nordenskiöld, *Voyage of Vega 2*, 75-150.

¹⁰⁴ Nordenskiöld, *Voyage of Vega 1*, 472.

¹⁰⁵ Nordenskiöld, *Voyage of Vega 1*, 490.

¹⁰⁶ Nordenskiöld, *Voyage of Vega 1*, 438.

¹⁰⁷ Nordenskiöld, “Om flytande vågbrytare,” 1-2.

¹⁰⁸ Robert Runeberg’s letter to Nordenskiöld, April 14, 1893, in the Centre for the History of Science at the Royal Swedish Academy of Sciences in Stockholm, E01:24 Ru-Sc; Stepan Makaroff’s letters to Nordenskiöld, July 13, 1897 and Aug. 4, 1897, E01:16 M-Me.

drilled wells was a result of his observation of geological formations that contain water deep beneath the earth. When he was asked to procure good drinking water for the pilots and officers at pilot stations and lighthouses on islands along the Swedish coast in 1890s, he remembered that his father had once remarked that the water in the iron mines beneath the sea bottom was not salty. In Spitsbergen he observed that there is always running water between the geological layers at the depth of between 30 to 60 metres under the surface. When he conducted tests, he found that it was possible to obtain between 500 and 2,000 litres of good drinking water per hour by means of light pumping. According to him, this quantity of water would be suitable for household purposes, but not for large scale agriculture.¹⁰⁹

In 1883, Nordenskiöld departed Sweden for Greenland on what would be his last Arctic expedition. This voyage had two objectives: 1) to penetrate the ice cap in order find out whether Greenland was covered by ice, or whether, as he supposed, there was an open, green interior and 2) to find old Viking village sites that he presumed to be on the eastern coast. With five scientists and two Lapps,¹¹⁰ he penetrated 50 kilometres into the ice cap. The Lapps proceeded on skis for a further 230 kilometres, but they found no open land. Neither did the expedition find any sites of Viking settlements on the eastern coast. From Egedesminde (today Aasiaat), he wrote to his wife Anna: "I will now quit my Arctic journeys [...] I have missed you and our children beyond any description [...] It is clear I will never again leave home on long voyages."¹¹¹

Adolf and Anna Nordenskiöld had four children: Maria, Gustav, Anna and Erland. The eldest daughter was born when her father was on an expedition in Spitsbergen in 1864. The youngest son was born in 1877, the year before the Vega voyage. Nordenskiöld gladly spent time with his children. He took them for walks, to the theatre and to the opera. In his letters, he described things he knew his family would be interested in.¹¹² The Nordenskiölds lived in an apartment in the building of the old National Museum of Natural History in Drottninggatan. Later they moved to a new apartment. In 1882, Nordenskiöld purchased the country estate of Dalbyö. It was located approximately from Stockholm. According to George Kish, it was reminiscent of the country homes Adolf and Anna once knew in Finland. Dalbyö remained their most cherished possession for the remainder of their lives.¹¹³ Gustav and Erland chose careers in science: the former took up geology as his vocation and the latter ethnography. Two of the children died prematurely. Maria died in 1886 and Gustav died in 1895. Both passed away as a result of tuberculosis.¹¹⁴

In 1893, Nordenskiöld was appointed to the Swedish Academy. In 1899, he was one of the nine members of an international delegation that tried to appeal to Tsar Nicholas II on behalf of Finland, which was suffering at the time from the implementation of Russification

¹⁰⁹ Nordenskiöld, "Om bormingar," 270-2, 283-4.

¹¹⁰ In his texts Nordenskiöld used the word 'Lapp' to describe the people of the North Scandinavia. The word 'Sámi' would be the right word today.

¹¹¹ Nordenskiöld' letter to Anna Nordenskiöld, September 16, 1883 in the Centre for the History of Science at the Royal Swedish Academy of Sciences in Stockholm, B01:3.

¹¹² Kish, *North-East Passage*, 266.

¹¹³ Kish, *North-East Passage*, 231.

¹¹⁴ Blåfield, *Nordenskiöld*, 361; Kish, *North-East Passage*, 266-8.

policies by the tsarist authorities. The tsar refused to receive the delegation, which greatly disappointed Nordenskiöld. In 1901, Nordenskiöld died at the age of 69 at Dalbyö.

Sweden celebrates Vega Day (Vegadagen) on April 24th every year in honour of the day when Nordenskiöld returned to Stockholm onboard his famed ship. The day was recognized in 1902 by the Swedish Society for Anthropology and Geography (Svenska Sällskapet för Antropologi och Geografi). On this day, Vega Medal (Vegamedaljen) is presented to a distinguished geographer.¹¹⁵ The Nordenskiöld Society in Finland (Norden-skiöld-Samfundet i Finland) was established in 1939 in order to honour his memory and to promote scientific research. His name is also immortalized in Irkutsk, Siberia, on the outside wall of an old building among nineteen friezes bear the names of well-known explorers of Siberia, including Steller, Wrangel, Humboldt, Gmelin, Pallas and Bering.¹¹⁶

¹¹⁵ <http://www.ssag.se/index.php?sida=historia>, 12/2012.

¹¹⁶ Observed by the author in Irkutsk in 2007.

Nordenskiöld's Conservational Philosophy

The Australian economic historian Christopher Lloyd thinks that the forces of deep social time, which ebb and flow beneath the visible world of events and processes, link the past, present and future. These forces, “like those of deep geological and biological time, have to be examined if we are to understand the conjunctures of economies, politics, geographies and societies with their manifold determinations of episodes, processes, and events of various kinds, of which wars are but the most savage and destructive kinds.” Wars are crises: they are disruptions, destructive discontinuities and sometimes creative destructions, from which new eras begin and new paths are delineated.¹¹⁷ The expansion of the conservation movement can be called a war for nature. This expansion is one force beneath the visible world of events and processes that link the past, present and future. Some of the roots of the ideology of conservation derive from the progress made in regards to infrastructure and technological innovations, which threatened the environment and against which Nordenskiöld wanted to do something to prevent an ecological disaster. His preventative method developed into the idea of national parks, which would protect nature from the assault of technology and would save pristine nature in open-air museums for the joy of future generations.

Animal protection emerged as one of the first manifestations of a new conservation ideology in Europe. Laws against cruelty to animals were enacted in Great Britain in 1822, for example, and in France in 1824.¹¹⁸ The protection of insectivorous birds in the 1860s marked an early step towards environmental awareness.¹¹⁹ From his first expedition in 1858, Nordenskiöld expressed his opinions and concerns about Arctic animals, such as whales, walrus and eiders. In “Förslag,” animals are mentioned only in some sentences, including the following: “in national parks [...] all but the more dangerous animals could roam safe from the hunter's bullet all the year round.”¹²⁰ Nordenskiöld disliked animals being housed in zoos, which he regarded as animal prisons. He felt that they were forcibly brought to their enclosures in order to merely titillate the thrill-seeking public. He thought that it was worthless to replicate such institutions in the Nordic countries, where the climate was too harsh. Instead, Nordenskiöld suggested that some of the money reserved for zoos could be invested in constructing and maintaining national parks.¹²¹

At the beginning of “Förslag,” Nordenskiöld lists modern inventions, such as the railway, telegraph lines and various mills that were being built in the farthest areas of countryside. This new infrastructure served the rapidly expanding wood-processing industry in the Nordic countries. These manufacturing plants were manifestations of the modernization process: the transition from a traditional agricultural society to a modern

¹¹⁷ Lloyd, “Present, and Future,” 81.

¹¹⁸ *Meyers Konversations-Lexikon*, Sechzehnter Band, 885; Scharp, *Djuren och vi*, 46, 50, 90.

¹¹⁹ Lundin, *Staten och naturen*, 25-33.

¹²⁰ Nordenskiöld, “Förslag,” 10. The original text reads: “alla djur, som ej vore verkliga skadedjur, året om kunde gå trygga för jägarens lod.”

¹²¹ Nordenskiöld, “Förslag,” 10.

industrial one. Marc Cioc, Björn-Ola Linnér and Matt Osborn have stated that “Europeans [...] were themselves deep in the throes of industrialization and therefore silent witnesses to one of the greatest transformations in human history.”¹²² Nordenskiöld wanted to preserve Nordic forests, but he also understood their economic value. That is why he recommended that national parks should be established in remote regions that were of less economic value.

Laws in Europe have long regulated the use of forests. In many European countries certain wooded areas were reserved for the monarch and nobility as private hunting grounds.¹²³ In Sweden, some scientists and authors began to be concerned in the eighteenth century about the negative impact of the peasantry on native forests. The professor of economics at the Academy of Turku, Pehr Kalm (1716-1779), for example, recommended restrictions on the exploitation of forests by the peasantry. He also suggested that foresters should be hired and that new saplings should be planted. In the nineteenth century, Zacharias Topelius recommended that new trees should be planted in Finland.¹²⁴ Nordenskiöld, Topelius and Kalm observed alterations in the environment and proposed to improvements to remedy this situation. While Kalm and Topelius preferred conservation for the sake of utility, Nordenskiöld recommended the establishment of national parks for the sake of beauty and history.

The Australian professor of history, Gregory Barton, notes that “a history of modern environmentalism is a history of the relationship of people with their environment, particularly the history of advocacy and preservation.”¹²⁵ He lists number of reasons why the preservation of forests has been an important topic within environmental history. In addition to timber supply and revenue, which are issues that have demanded the attention of governments, climate theories that explain how forest lands are affected by rainfall, along with soil preservation, water flow, animal life, and the preservation of a variety of forest flora and fauna made forestry the most pressing environmental issue in the late nineteenth and early twentieth centuries.¹²⁶ However, Barton does not mention arguments related to forests as repositories of national history or of the beauty of native nature, which were important motives for Nordenskiöld’s conservational ideas. Economic and natural scientific motives top Barton’s list of priorities.

The British anthropologist Tim Ingold states that new ideas do not flow in a historical vacuum, but rather respond to the dominant moral, political and economic concerns of the time.¹²⁷ In the second half of the nineteenth century, nationalism and

¹²² Cioc et al., “Environmental History in Northern Europe,” 396.

¹²³ Scharp, *Djuren och vi*, 14-5; Madsen, *Naturfredningssagens*, 10-1; *Kongl. Maj:ts Nådiga Förordning Om Skogarne i Riket. Gifwen Helsingborg den i Augusti 1805*. In Denmark, the economic value of the forests was also the first reason for the governmental reserves in 1805. After some decades, the scientific reasoning effected in the preservation as well, for instance, of the bog Gammelmosen in 1844. Conwentz, “Om skydd,” 39: In Poland, the Białowieża Forest was, in the 15th century, a property of the king. The forest was declared a hunting reserve in 1541 for the protection of the European bison.

¹²⁴ Kalm, *Oförgräpelig tanckar*, 44; Topelius, *Maamme kirja*, 102. This book was used as a textbook in elementary schools in Finland for several decades. It is well known as a source of patriotic pride for many generations.

¹²⁵ Barton, *Empire Forestry*, 9.

¹²⁶ Barton, *Empire Forestry*, 9.

¹²⁷ Ingold, “General Introduction,” xiii.

patriotism were extremely influential concepts throughout Europe. Nordenskiöld was born in Finland, where landscapes mostly feature dark green forests spotted with thousands of lakes and rivers. When the spirit of nationalism awoke in Finland, these forests came to embody the most noble and most original Finnish character. In Sweden, the contemporaneous emergence of a new form of patriotism also arose from the unity of the Swedish people and nature. Moors, forests and various natural wonders became national symbols.¹²⁸ In Germany, the nineteenth-century Romantic cult of nature invested the landscape with an abundance of symbolic meaning as well.¹²⁹ Thomas Lekan names the Rhineland's scenic beauty and Roman and medieval ruins as inspiring motif for the early nineteenth-century literary and aesthetic movement known as Rhine Romanticism (*Rheineromantik*).¹³⁰ In my article "Historical Roots," I discuss ideas of European Romanticism, which are interwoven in Nordenskiöld's conservational philosophy.

Richard H. Grove lists individuals from the late eighteenth century who "had a deep sense of historical perspective on environmental change and very often a wide and very scholarly appreciation of the historical evidence for rapid environmental change over time." Grove names such characters as Hugh Gleghorn, who pioneered forest conservation in India, George Perkins Marsh, the American historian of global environmental change, and Alexander von Humboldt, especially in regard to his "Cosmos" treatise.¹³¹ Nordenskiöld can easily be listed among these pioneers. Gleghorn's writings may have even been familiar to him. In his library, there is a copy of the report of the 1851 annual meeting of The British Association for the Advancement of Science, in which Gleghorn wrote about the destruction of Indian tropical forests.¹³² These pages have been cut open for reading so we can assume that the content was familiar to Nordenskiöld before he wrote "Förslag."

The first national park in the world, Yellowstone National Park, was founded in 1872 in the United States. Most historians, who have studied the history of Nordic conservation, refer to Nordenskiöld's "Förslag" essay and suggest that Yellowstone Park acted as the template for Nordenskiöld's vision of a '*rikspark*.' However, no authors back up this argument with any concrete evidence to support such a claim.¹³³ As I make clear in my article "Historical Roots," Lundgren is one of the few scholars who has looked somewhat more thoroughly into the possible sources behind Nordenskiöld's "Förslag." Lundgren repeats the same arguments as other historians, vis-à-vis the influence of Yellowstone and George Perkins Marsh, but also asks why Nordenskiöld did not promote his proposal more energetically. He suggests that the conservation issue for Nordenskiöld was perhaps merely one interest among many. According to Lundgren, Nordenskiöld saw no need for a national park in northern Sweden, since nature in many places in this area remained in an almost pristine state.¹³⁴ I consider that Nordenskiöld's Finnish friend Anton Blomqvist, might have

¹²⁸ Sundin, "Naturparker," 201-2.

¹²⁹ Lekan, *Imagining the Nation*, 1.

¹³⁰ Lekan, *Imagining the Nation*, 9.

¹³¹ Grove, "Environmental History," 261-82.

¹³² Cleghorn et al. "Report of the Committee," 78-102.

¹³³ See for instance: Högdahl, *Naturskydd i Sverige*, 6; Pekurinen, "Sivistys velvoittaa," 130; Sundin, "Environmental Protection," 201; *Svenska naturskyddsföreningen*, 6.

¹³⁴ Lundgren, *Staten och naturen*, 43-5.

spurred him to write his essay and then promoted it. After Nordenskiöld completed the brief work, he seemingly put the idea to one side, whilst Blomqvist promoted the idea of national park in Finland. I discuss this subject in more detail in the chapter “Interactions with Contemporaries” as well as in my article “Historical Roots.”

In addition to Yellowstone National Park, George Perkins Marsh’s *Man and Nature* is named as a key inspiration for Nordenskiöld.¹³⁵ It is true that Nordenskiöld’s thoughts resemble those of Marsh, but I argue that the ideas of George Catlin (1796-1872) in *Illustrations of the Manners, Customs, and Condition of the North American Indians* (1845) were a real inspiration for Nordenskiöld. Catlin was the first advocate of national parks in the USA. He wrote his book after he had travelled five times around the American West during the 1830s. While travelling, he experienced the unique nature of the land and the lifestyle of the Plains Indians. He foresaw the plight of the indigenous Native Americans and, thus, suggested that they be helped, along with bison “by some great protecting policy of government [...] in a magnificent park [...] *A nation's Park* containing man and beast, in all the wild and freshness of their nature’s beauty.”¹³⁶ Catlin’s book is in Nordenskiöld’s library. It is impossible to know whether he read this text before he wrote “Förslag”, but Catlin’s ideas are identical to those later advocated by Nordenskiöld. For example, I think that Nordenskiöld translated Catlin’s words phrase ‘*a nation’s Park*’ into the Swedish ‘*rikspark*’, which he used in his text. Catlin was concerned about Native American culture: their lifestyle, customs, traditions, social practices, folkways and material artefacts. Similarly, Nordenskiöld was concerned about the culture of Nordic people. Unlike Catlin, who was not so interested in natural scenery, Nordenskiöld wanted to preserve the beauty of the Nordic landscape. He combined an appreciation of natural beauty alongside the historical and cultural relationship between landscapes and people in “Förslag.”

In addition to Catlin, Nordenskiöld may have adapted some conservational ideas when he was a jury member at Centennial Exposition in Philadelphia in 1876.¹³⁷ He may have been able to enjoy discussions with like-minded individuals at this event about how to protect nature, as I suggest in my article “Historical Roots.” The Dutch historian Henny J. Van der Wind considers that it was only Scandinavia and the German-speaking countries that adopted the idea of national parks after they had been introduced in the United States, although he adds that in Germany the focus was more on the preservation of plants, animals and cultivated landscapes. He also points out that the development of conservation as an important aspect of national policy varied from country to country. There were obvious differences in Europe in terms of priorities, as well as in the precise definition of nature conservation and in the practices and forms of institution devoted to the new concept. The Dutch nature conservation movement, for instance, borrowed a great deal from Germany, Great Britain and the United States of America.¹³⁸

Nordenskiöld wrote “Förslag” because he wanted to make his fellow citizens aware of the on-going destruction of nature. He regularly wrote down his first-hand observations

¹³⁵ Blåfield, “A. E. Nordenskiöld ja kansallispuistoaaate,” 60

¹³⁶ Catlin, *Illustrations*, 256.

¹³⁷ Nordenskiöld, *Nils Adolf Erik Nordenskiöld*, 37.

¹³⁸ van der Wind, “Rise of the Nature Conservation Movement.”

of the serious destructions of the Arctic environment in his notebooks and published them in his texts. What he witnessed in the Arctic made him aware of the vulnerability of the environment. He understood that something had to be done in order to prevent catastrophes in nature. He was also worried about how to combine welfare progress with the aesthetic values of nature. His solution was the establishment of national parks.

Interactions with Contemporaries

Arthur F. McEvoy suggests that a person's world view develops through interaction with social and material environments and that "those views change as people continually make the world over in response to changing ways of understanding it."¹³⁹ Nordenskiöld inherited his attitudes and values from his family. He expressed a variety of opinions and observations in numerous letters to his father. As a scientist, he worked and shared experiences with his colleagues in the fields of zoology, botany, meteorology and in other natural sciences. He corresponded with a wide network of national and international colleagues, who influenced his thoughts and attitudes. At the same time, he influenced his friends and colleagues over the course of his life.

During his expeditions, it is likely that he discussed issues related to the protection of nature and animals with his colleagues. Some members of his scientific teams on the expeditions wrote essays and books about the extinction of species and the need to protect animals and forests. For instance, the geologist Alfred Gabriel Nathorst (1850-1921) published a book entitled *Hafva djuren rättighet att lefva?* (Have the Animals Right to Live?) in 1907. The zoologist Gustaf Isak Kolthoff (1845-1913) was a known authority among specialists of Nordic birdlife. The botanist Axel Nikolaus Lundström (1847-1905) was concerned about the well-being of Nordic forests. The zoologist August Vilhelm Malm (1821-1882) helped to establish the first Swedish society for the protection of small birds in Gothenburg in 1869. The natural scientist Anders Johan Malmgren (1834-1897) was an eager promoter of better fishing. He was a particular advocate of closed fishing season for salmon and for restocking valuable fish in Finnish waters. The zoologist Fredrik Adam Smitt (1839-1904) was known as an eager promoter of better fisheries. They most likely had a mutual interest in warding off the threat of extinction for certain species and for the need to protect animals and forests. Nordenskiöld and his colleagues perceived their environment in a new way. They were the initiators of new values, ethics and scientific theories. It is still important for contemporary natural scientists to cherish nature. With their books and articles, Nordenskiöld and his friends influenced the public and disseminated their ideas widely.

The above-mentioned society founded by Malm with the help of the school teacher C. G. Svensson, was called *Småfoglarnas vänner* (Friends of Small Birds). In 1870, Topelius founded *Vårföreningen i Finland* (The Finnish Spring Society), which was a small birds' protection society for the children. The inspiration for this society most likely came from Sweden.¹⁴⁰ In Great Britain children were also recruited to promise to undertake a pledge that they would be kind to birds and animals in societies like *Band of Mercy*, established in 1875.¹⁴¹

At the turn of the nineteenth and twentieth centuries, foresters and geographers associated with the university in Helsinki promoted the idea of national parks. In Sweden, it

¹³⁹ McEvoy, "Toward an Interactive Theory of Nature and Culture," 215.

¹⁴⁰ Vuorisalo and Laihonon, "Biodiversity Conservation in the North," 281, 293; Topelius, *Elämäkerrallisia muistiinpanoja*, 287-8; Scharp, *Djuren och vi*, 98.

¹⁴¹ Milton, "Taking the Pledge."

was principally botanists, zoologists, and geologists, associated with universities in Lund and Uppsala and with the Academy of Sciences and the Museum of Natural History, who took the initiative in promoting conservation.¹⁴² In Sweden, Pehr Arvid Säve (1811-1887), a school teacher from Visby, is often regarded as the first advocate of conservation. This opinion is based on an article he wrote in 1877, entitled “Sista paret ut!” (The last pair out!). He recommended the enactment of a new law in order to ratify the relationship between mankind and animals.¹⁴³ Historians have overlooked the fact that he also discussed the observations made by Nordenskiöld on his expeditions to Spitsbergen in 1861 and 1864 in regard to the destruction of Arctic animals and proposals for enacting laws to protect them.¹⁴⁴

In Finland, Nordenskiöld’s “Förslag” is considered to be the country’s first noteworthy work devoted to the theme of conservation. The essay was reprinted in 1881 in *Finska forstföreningens meddelanden* (Bulletin of the Society of Finnish Foresters) at the instigation of Anton Blomqvist.¹⁴⁵ The following year, Blomqvist spoke about the subject at the annual meeting of the Society of Finnish Foresters. He proposed that a single national park should be created according to the text of Nordenskiöld’s essay. The one-park pattern was repeated by both Finnish and Swedish scholars in the years to come though Nordenskiöld recommended several parks in the title of the article.

In 1891, Ragnar Hult, the chairman of the Finnish Geographical Society, put forward Nordenskiöld’s national park idea at a meeting of the society. He also published an article on the subject, which was cited in several newspapers.¹⁴⁶ He added some realistic and scientific details to Nordenskiöld’s original idea. However, no concrete action occurred in the wake of his talk. In 1898, the botanist Professor J. P. Norrlin raised the topic at a meeting of *Societas pro Fauna et Flora Fennica*, again with no concrete results.¹⁴⁷ Hult and Norrlin connected natural scientific study with the idea of national parks, although Nordenskiöld’s concern in “Förslag” was not strictly scientific. However, the lines “Learned people should therefore be prouder of advancements in this sphere than of victories in the fields of power” can be interpreted as a reference to science.¹⁴⁸

In 1903, the Finnish Senate began to introduce laws to protect forests for future generations and for scientific study.¹⁴⁹ In 1905, a committee began to handle the question of national parks in Finland.¹⁵⁰ The area around Ounastunturi, Pallastunturi and Yllästunturi in northern Finland was thought to be a suitable place for a national park. In 1914, a nature

¹⁴² Frängsmyr, “Introduction,” 18: The Royal Academy of Sciences in Stockholm worked actively for environmental protection and it had an important role in the creation of Sweden’s national parks.

¹⁴³ Söderberg, *Miljövården under 100 år*, 4: *Svenska Naturskyddsföreningen 50 år*, 5; Säve, “Sista paret ut!,” 83.

¹⁴⁴ Säve, “Sista paret ut!,” 76.

¹⁴⁵ Otto Nordenskiöld’s letter to Nordenskiöld Nov. 16, 1880, and Nordenskiöld’s letter to Otto Nordenskiöld Nov. 21, 1880, in the Frugårds Archiv, The National Library of Finland in Helsinki.

¹⁴⁶ Hult, “Nationalpark i Finland;” *Hufvudstadsbaludet* 4.5.1891, 2; *Finland*, 12.1.1892, 1.

¹⁴⁷ Palmén, *Om naturskydd*. 2; Palmgren, *Naturskydd och kultur I*. 161-4, 174; Myllyntaus, “Suomalaisen ympäristöhistorian,” 321-31.

¹⁴⁸ Nordenskiöld, “Förslag,” 10. The original text reads: Mer stolta böra derför alla bildade folk vara öfver framsteg på detta område än öfver segrar på våldets stråt.

¹⁴⁹ Mäkelä, “Koskemattoman luonnon,” 26; Nyysönen, “Luonnonkansa,” 100.

¹⁵⁰ Häyren, “Nationalparker i Finland,” 690; Palmén, *Om naturskydd*, 3; Montell, “Den tilltänkta nationalparken,” 10-7.

reserve was established at Mallatunturi in Lapland.¹⁵¹ However, the subsequently uncertain political situation ensured that these plans stalled. Finland became independent in 1917, was embroiled in a civil war in 1918 and the efforts to build a new republic stretched the capacities of the young state. Thus, it took until 1938 to fulfil Nordenskiöld's idea of establishing national parks in Finland. The first two national parks were situated in Lapland: one around the Pyhä and the other around the Pallas and Ounas fells.

In 1887, the ideas of "Förslag" were mentioned for the first time in public in Sweden in the encyclopaedia *Nordisk familjebok*, under the heading of 'nationalpark (rikspark)'.¹⁵² According to the encyclopaedia, Nordenskiöld had suggested that "the state should set aside some remote district of a fell area for a national park which, after hundreds of years, would give an illustrative picture of Swedish contemporary plant and animal world, of the physiognomy of the wilderness and cultivated land."¹⁵³ The word 'nationalpark (rikspark)' was defined as "a region which a state has reserved to rescue the natural characteristics of that country from the hands of private owners and from damage and to create a long-lasting monument of the nature of the fatherland."¹⁵⁴ The encyclopaedia gave three examples: Yellowstone National Park and Mariposa Grove (today the southern-most part of Yosemite National Park), in the United States, and Banff National Park in Canada.

In 1904, three years after Nordenskiöld's death, the issue of national parks became a topic of public discussion in Sweden, when Hugo Conwentz, a German botanist and important initiator of conservation in Prussia, visited the country.¹⁵⁵ According to Sundin, Conwentz's lectures and subsequent article "were the primary impetus for a motion in [the Swedish] parliament by Karl Starbäck proposing an inquiry into appropriate measures for protecting Sweden's nature and natural landmarks."¹⁵⁶ Starbäck's proposal won parliamentary support and became firmly established in the Academy of Sciences. The Academy executed the proposed inquiry. In September 1904, the first Committee for the Protection of Nature appointed A.G. Nathorst, a friend of Nordenskiöld, as one of its members. The committee stressed the importance of educating the public. Lessons in schools and institutes were to give greater weight to the need to care for and protect nature.¹⁵⁷ Today, this recommendation would be called a proposal for environmental education.

The first national parks in Sweden—Abisko, Hamra, Garphytte, Gotska Sandö, Peljekaise, Sarek, Sonfjällets, Stora Sjöfallet, and Ängsö—were established in 1909.¹⁵⁸ They are situated in northern and central Sweden. They are all in places that are consistent with

¹⁵¹ Nyssönen, "Luonnonkansa," 100.

¹⁵² *Nordisk familjebok*, 11, 854. In *Nordisk familjebok*, 13, 1176, under the heading 'Rikspark' is only a reference to 'Nationalpark'.

¹⁵³ *Nordisk familjebok*, 11, 854: The original text reads: "staten borde anslå någon obygd i trakten af fjällryggen till en nationalpark, hvilken skulle kunna ännu efter århundraden gifva en åskådlig bild af Sveriges nuvarande växt- och djurverld, vildmarks- och odlingsfysionomi."

¹⁵⁴ *Nordisk familjebok*, 11, 854: The original text reads: "Nationalpark (rikspark), ett inom ett land for statens räkning afsöndradt område, hvars naturmärkvärdigheter hållas fredade för enskildas besittning och åverkan för att kunna utgöra likasom ett bestående monument af fosterlandets natur."

¹⁵⁵ Conwentz, "Om skydd," 2-42.

¹⁵⁶ Sundin, "Environmental Protection," 202.

¹⁵⁷ Sundin, "Environmental Protection," 203.

¹⁵⁸ *Nordisk familjebok*, 19, 543.

Nordenskiöld's recommendation in "Förslag" that they should be "publicly owned land [...] which yield insignificant or no profit."

One interesting topic, with which Nordenskiöld was also preoccupied, was the status of Spitsbergen, in respect to its natural resources, flora and fauna and sovereignty. In 1871, he attempted to ensure that Spitsbergen could be claimed by the Swedish crown, but the Russian government protested. In the summer of 1896, Count Ludvig Douglas (1849-1916), the Foreign Minister of Sweden, contacted Nordenskiöld and asked for his opinion regarding an international treaty for Spitsbergen and a bill on closed hunting seasons for certain animals in the area. I have not found evidence that Nordenskiöld answered to this request. In 1914, Hugo Conwentz began an initiative to protect the landscape, flora and wildlife of Spitsbergen. In 1920, the Treaty Concerning the Archipelago of Spitsbergen was signed by a group of western nations, including Sweden. According to the second article of this document, Spitsbergen was to fall under Norwegian control.¹⁵⁹ Before the signing of this treaty, Spitsbergen had not been formally claimed by any nation state.¹⁶⁰

It would be an interesting topic to undertake a closer study of Nordenskiöld's thoughts and ideas on Spitsbergen in general. Nordenskiöld was one of the founders of AB Isfjord, for example, which was established in order to take advantage of certain phosphate beds that he had discovered on his third expedition to Spitsbergen in 1864. However, it was closed after being badly managed after only one winter in the spring of 1872.¹⁶¹

¹⁵⁹ Wråkberg, "Nature Conservationism," 1-23.

¹⁶⁰ Conway, *No Man's Land*.

¹⁶¹ Nordenskiöld, *Nils Adolf Erik Nordenskiöld*, 32.

Adolf Erik Nordenskiöld, a Pioneer of Nordic Conservation

At present, environmental education is an important way to teach people to act in an appropriate manner to protect their natural surroundings. Environmentally literate skills are an essential result of good environmental education. Measures to ensure that citizens are environmentally literate about the causes and consequences of environmental damage are a necessary component of any strategy to resolve environmental problems. If people understand critical issues on a personal level, they are more willing to support the protection of environmental quality, biodiversity and the natural ecosystem.

My doctoral thesis is a study of the environmental literacy of a nineteenth-century explorer and scientist and his conservational ideas, which were innovative at the time. The most influential legacy bequeathed by Adolf Erik Nordenskiöld was the stipulation in his will to save forested landscapes for the sake of their beauty and the history that is hidden in them for future generations. His reasons were aesthetic and ethical. He had not studied environmental literacy or received any form of environmental education at school or at any other institution. However, he held ecological and environmental values and attitudes, which are today the goal of environmental education. These values steered him to act for ethical, biological, social and aesthetic goals, such as the need to respect and cherish life, as well as promoting empathy, solidarity, justice, self-fulfilment and the need for active involvement.

In my articles, I describe Nordenskiöld's research, perceptions and experiences regarding the environment and his conservational ideas. I think that the examples I cite prove that he reacted to his perceptions and observations as an environmentally literate person. He operated on the three levels of environmental literacy: nominal, functional and operational. He acquired a comprehensive understanding of the environment by means of active experience and by making observations, as well as through the acquisition of knowledge, values and attitudes, which are the basic elements of environmental literacy. He reached the operational level of environmental literacy when he progressed beyond functional literacy by understanding the threat of human destruction in nature and by proposing methods to remedy or prevent damages. His environmentally literate skills enabled him to perceive new possibilities and to accomplish deeds that at first seemed impossible.

I have also described the roots of his conservational philosophy and his subsequent influence on the conservation movement in Finland and Sweden. Animal protection is one of the red lines that runs through the history of conservation. The first signs of Nordenskiöld's environmental literacy are visible in the notes of his first expedition to Spitsbergen in 1858, when he observed the threat posed to eider colonies caused by rapacious hunters. During his career as an explorer he commented on various kinds of destruction in the animal world of the Arctic. These remarks are sporadic compared to the other scientific topics he addressed in regard to his expeditions. However, his remarks vis-à-vis destruction and extinction give us a picture of a man who was concerned about what was happening in the Arctic and in nature in general as a result of human impact. He combined what he observed with the scientific facts he knew. He was a synthesizer who collected and reflected

the ideas of his own time. He also listened to the stories of fishers and hunters in the Arctic region and learned from them that whales had almost disappeared around Spitsbergen, where they had previously been abundant. He understood that hunting was essential to many local hunters since it provided a valuable source of livelihood, but he wanted to remedy the situation by reporting his observations and by making suggestions for improving the state of affairs.

Nordenskiöld wrote only one short article “Förslag” on nature conservation. He was a foresighted individual who warned of an impending environmental crisis. Yet, in his last years he was seemingly more interested in cartography than in promoting methods to protect natural environment. Hitherto, Nordenskiöld has not attracted the attention of environmental historians on a large scale, but I think that he offers many interesting topics for further examination. For example, his opinions and concerns about the history and scientific and geographical research on Spitsbergen could potentially offer new insights into the environmental history of the area. It would also be interesting to compare his expeditions and surveys with those of John Wesley Powell, who surveyed and explored the Colorado River and surroundings in the 1860s and 1870s. Nordenskiöld’s reputation in Finnish and Swedish environmental history remains under studied.

Nordenskiöld inherited his way of thinking and experiencing the world from his family and his ancestors, who were members of the Finnish-Swedish nobility. The traditions in his family were strongly oriented towards natural history. He also absorbed ideas of his time and was influenced by his teachers, friends and colleagues. He presumably discussed the topic of nature protection with his colleagues during his expeditions. Many of his colleagues, both in Sweden and Finland and abroad, shared his concerns. Indeed, after his death, they continued to argue for conservation. Hugo Conwentz, for example, who acknowledged that his visits to Sweden from 1889 onwards influenced his conservational ideas significantly, praised Nordenskiöld as being the ingenious initiator of the idea of conservation in Scandinavian countries.

Nordenskiöld was one of the leading men in Swedish and Finnish scientific circles. When he published his observations on environmental deteriorations in scholarly and popular publications, and discussed potential efforts to combat this issue, his new environmental discourse began to change people’s thoughts about nature. His contribution to posterity is a deeper awareness of the roots of our contemporary perception of nature. History is not only about understanding the past, it is a necessary tool for creating a better future: policy makers use assumptions about history in order to make decisions concerning our future. Over the *longue durée* of history every individual has his own place and meaning. Nordenskiöld’s place in the history of Nordic conservation is as a pioneer. Through his example we understand the role of individuals in the history of the environment, as well as the fact that everybody has the potential to impact on history and the environment. His story emphasizes the importance of every individual in the interpretation of environmental problems and in the promotion of environmental awareness.

Conservation history is an essential ingredient in environmental history studies. The expansion of the conservation movement can be called a war for nature. Nordenskiöld wanted to fight for nature, against new kinds of infrastructure and technological innovations

that threatened the pristine nature of Nordic countries. He also wanted to do something to prevent such a disaster. His solution was to establish national parks, which would save pristine nature in open-air museums for the joy of future generations.

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