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- The representation of animals’ gender behavior in popular science

“Naturen är full av våldtäktsmän”

- Representationen av djurs genusbeteende i populärvetenskap



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Abstract

This master's thesis in rural development investigates the representations of animals and their social- and gender behavior in a Swedish popular science magazine. How is gender produced and reproduced, and how is language used to establish and maintain existing power relations? These are the questions that this thesis aim to answer. The analysis has been made on selected texts from the magazine *Illustrerad Vetenskap* year 2015 with focus on, and inspired from, a critical conception of *ideology*. The result shows that the division of human sexes is made legitimate in *Illustrerad Vetenskap* by presenting animals as carriers of the “natural” sex roles at the same time as presenting the animals as similar to humans. Further, the female animals are presented as less willing to participate in sexual activities, less active and less rational than the males, and with the main responsibility for nursing offspring.

Keywords: Gender, popular science, ideology

Sammanfattning på svenska

Denna mastersuppsats i landsbygdsutveckling undersöker hur djurs genusbeteende representeras i ett svenskt populärvetenskapligt magasin. Hur produceras och reproduceras genus, och hur används språk för att etablera och upprätthålla existerande maktförhållanden mellan könen? Dessa är de två övergripande frågor som ämnas besvaras. Analysen har utförts på utvalda texter från *Illustrerad Vetenskaps* samtliga nummer från år 2015 med fokus på, och inspiration från, ett kritiskt förhållnings-sätt till ideologibegreppet. Resultatet visar att uppdelningen av mänskliga kön görs legitima i *Illustrerad Vetenskap* genom att presentera djur som bärare av de ”naturliga” könsrollerna, samtidigt som de presenteras som människolika. Vidare presenteras hondjur som mindre villiga att para sig, mindre aktiva och rationella, och med det största ansvaret i omhändertagandet av avkommor.

Nyckelord: Genus, populärvetenskap, ideologi

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Nature is full of rapists

Sharp penis spikes the female. *The bed bug conducts the mating act with a brutality that in the humans' world would lead to a long imprisonment. The phenomenon is called "traumatic insemination" and means that a male attacks a female with his spear-shaped sex organ and penetrates her exo-skeleton at a random location. After that, he sprays the sperm cells into her body and they may themselves find their way to the eggs and fertilize them. The treatment is so violent that she definitely isn't interested of mating again. Often, the female dies shortly after the oviposition.*

Illustrerad Vetenskap 2015/12:3

1 Introduction

There is a long tradition of perceiving natural science as objective, true and without influence from human social organization and culture. At the same time, many people now claim that human culture and social organization will always have an impact on science and how we view nature (cf. Zuk 2002). That is by the simple reason that the research is carried out by humans. However, the idea of the objective science is still wide spread, and what it mediates may hence have an enormous impact on the consciousness of its audience.

What is a woman and what is a man? Even though many people in their everyday life seem to have more or less clear answers to these questions and leave the notions of feminine and masculine unchallenged, it is important to point out that these notions differ enormously within different contexts, have changed dramatically during history and are questioned by many, such as the feminist and queer movements. With this in mind, one can stress that sex is socially constructed (see e.g. Butler, 1990). Why then are many people so “confident” with gender division? One thing is repetition – we are constantly performing gender practices that help to confirm (or reconstruct) our gender ideas. This repetition comes with a sense of essentiality; that the ideas are obvious and not even ideas as such, but naturally given. The maintaining of this myth - about a natural gender behavior - might have other sources for inspiration as well. That is, for example, the imagination of sex divisions and roles within the animal sphere.

This thesis takes departure from two claims: (1) Our cultural preconceptions and categories, as well as how we socially organize our societies, influences how we (scientists as well as others) interpret animal behavior and (2) what we perceive as animals play an important role as representatives for nature in inspiring and

naturalizing the building and maintaining of the myth of the essential human behavior (e.g. concerning gender). Thus, one can say that at the same time as culture makes nature, nature also makes culture (Zuk 2002; Ganetz 2004; Martin 1991; Åsberg 2002).

In this thesis, I aim to take a closer look at the first of these claims, namely how culture constructs specific notions of nature and more specifically how culture is making **gender** in nature. *How* is this gender construction made and what role does science and mass media play in it? To investigate this, I have chosen to study what are often considered a link between science and the world outside the universities - popular science magazines - and the message it gives us about animals' social and gender life.

1.1 Aim and research questions

The aim of this study is to investigate how behavior of animals is gendered when described, represented and analyzed in a popular science magazine. The questions I aim to focus on are the following:

- How is gender produced and reproduced within the discourse of animal behavior in popular science?
- How does the discourse of animal behavior in popular science serve to establish and maintain existing power relations between sexes?

To answer these questions, I have studied articles concerning animal behavior in the Swedish popular science magazine *Illustrerad Vetenskap*.

2 Methodology, starting points and theoretical concepts

In this chapter I will provide some practical information concerning the procedure of the research and the theories and standpoints that constitutes the base for it.

2.1 The material, categorization and analysis method

The Nordic popular science magazine *Illustrerad Vetenskap* (English: *Illustrated Science*, writer's translation) was founded in 1984, is edited in 13 countries and has approximately 600 000 readers in Sweden (illvet.se 2016). According to *Add Sales group* (2016) it is thus Sweden's largest monthly magazine.

Every issue of the magazine starts and ends with sections of shorter items and has a few longer articles in the middle. Neither the section with short items nor the articles contain a lot of text, since the perhaps most vital element of *Illustrerad Vetenskap* is, as the name suggests, the illustrations and explanations through them. Except the illustrations, every number also has at least one spread with a photograph capturing a special moment and a small caption describing it. The magazine contains ingredients from the whole spectra of natural science; astronomy, medicine, biology, chemistry, etc. There is thus not a special focus on zoology or animal science.

The empirical material consists of 18 issues, constituting all the issues of the year 2015. All of them have been looked through from beginning to end and every text that contained what I considered animals has been documented. In this first step of the documentation of the texts I labeled every text with what I

spontaneously considered being its main theme. That could be for example hunting, mating or size. Some of them were given more than one label. That gave me a broad overview of all the texts and made a good starting point for the analysis, and a way to easily search among my material. As you will find in the further reading of this thesis, only a few texts and articles from *Illustrerad Vetenskap* are presented and analyzed. This is not a quantitative analysis; the texts are chosen because I have found them interesting in one or more aspects and I do not claim them to represent anything else but themselves. The selection of the material has been made in a procedure where one text has led to another: in the deep reading of one text, I found a phenomenon that I would like to investigate further. Hence, I started to search in the other texts for signs that confirm or contradict my ideas about this phenomenon. In the reading of these texts I then found new interesting phenomena that I started searching for in the other texts.

The magazine and all the texts it contains are written in Swedish. An obvious obstacle to overcome, which is worth mentioning because of the language-focus in this thesis, is the translation. I have been working with my texts in Swedish during the main part of the process. Thus, the translation has come quite late and thereby I have strived to as far as possible keep the structure of the texts (orders of words, sentences etc.) in the translation. Because of that, the texts may sometimes seem improper. To encourage critics of my translations, all the texts presented in the thesis can be found in original language in the appendix.

2.2 The researcher

“This will not be a disinterested, objective study, nor a comprehensive one - partly because such studies are impossible for anyone, partly because I have

stakes that I want to make visible (and probably others as well)''
(Haraway 1989:3)

The concept of objectivity and ways to approach it in quantitative and qualitative research is discussed by many, amongst others Kvale & Brinkmann (2009). A common definition of objectivity is "freedom from bias," which means that the research is reliable, controlled and free from personal influence. This view of objectivity is based on a positivist worldview and is hence not applicable on a qualitative research. An alternative approach to objectivity, provided by Kvale & Brinkmann (ibid) is *reflexive objectivity*. That requires the researcher to reflect on her own contribution to knowledge and thereby meet the objectivity criterion; "[...] To strive to be objective in relation to the subjectivity" (ibid:260).

The author's background and preconceptions, I argue, have great significance not only for the analysis outcomes, but also for the formulation of the research question and the selected data. Given this, if the author as a subject is not visible, the validity of the research is not possible to examine. Therefore, I will below tell the readers briefly about myself.

I, the author of this text, am a student of agronomy and master in rural development. I identify myself as a white, heterosexual woman. My background is in the rural areas of northern Sweden where what was considered "nature" was always present. The categories of "animals" and "nature" was characterized both by its possibilities to be used by humans (for forestry, hunting, fishing and berry-picking) and its sentimental and aesthetic values. Since an early age, I have been concerned with gender and equality issues, and I call myself a feminist. My stake is that gender is constructed and thus limits us, and that the first step in the emancipation from this limitation is to uncover, make visible and demythicize these constructions

The only thing I can provide you with, in this thesis, is a few of many *possible* interpretations of the texts. Ultimately, the only subject's process of appropriation I can try to unveil is *my own*. I can try my best to get into other's perspective and other subject positions but they will all depart from me. Throughout this study, this issue is something that I have had to struggle with – the issue of using myself as a tool and being able to claim that that is, in a way, enough. I myself am a dweller of my own culture and because of that my interpretations have something to say about that culture and that specific context.

2.3 Ideology – meaning in the service of power

The texts have been investigated and analyzed with inspiration from Thompson's (1990) ideology analysis. His concept of ideology, "meaning in the service of power", provides a possible answer for the connection between discourse and power. The content of the concept of ideology has gone through large changes and still varies a lot within different contexts. I will thus here try to unravel the concept and briefly describe the way I will try to use it throughout this thesis.

When introduced by Destutt de Tracy in the end of the 18th century, *ideology* was a term to describe a new area of science: the science of *ideas*. Nowadays, the term has come to be used to refer to a set, or cluster, of ideas. In other words, a way to create meaning. Hence, the term has developed from meaning a *de-scription* of a phenomenon to now also include the phenomenon, as such. Thompson's (1990) way to use the ideology concept derives in many ways from Marx. What they have in common is mainly the connection to *power*, or *domination*. This implies what Thompson calls a critical conception of the term and can be contrasted to the, now perhaps more common, neutral conceptions

(Thompson 1990:53). Advocates of neutral conceptions of ideology (eg. Mannheim, and Lukács, according to Thompson) have an intention to free the concept from its negative connotations. In this meaning, a phenomenon can be seen as ideological even if it for example in its certain context serves for resistance - and not the sustaining – of domination.

With Thompson's definition, the study of ideology is the study of how meaning connects to power, and how it *serves* to establish and/or sustain domination and power relations (1990:5). This interplay between power and meaning is according to Thompson *mobilized by symbolic forms*, e.g. language, which can be said to be the media for ideology: the way that ideology is expressed and spread through, or in.

The idea of asymmetrical power relations is central in gender and feminist theories, and that is the reason I find the critical conception of the concept of ideology particularly fruitful for me to use. Even though Marx, in his discussion on domination and power relations, tended to focus on the class domination and thus to downplay the role of other dominations such as between the sexes or different ethnical groups, the parallel to this kind of domination is not far-fetched. That fact is also highlighted by Thompson (1990:57) who, in contrast to Marx, stresses that class domination is *one* of many forms of domination. With this said, my point of departure is that the animal behavior-discourse presented in *Illustrerad Vetenskap* is a phenomenon of ideology: a phenomenon that in certain circumstances serves to establish and sustain the current power relation between the sexes. What I aim to investigate in this thesis is *how* this is done, and as a help for that I will draw parallels to Thompson's *modes of operation* (1990:60) presented below.

Thompson (1990:60) identifies five different “general modes” through which he finds ideology operating: **Legitimation, dissimulation, unification, fragmentation** and **reification**. Within these modes, he highlights a couple of strategies of symbolic construction that can be linked to the modes. Those are:

For **Legitimation**: Rationalization, universalization and narrativization.

For **Dissimulation**: Displacement, euphemization and trope (e.g. synecdoche, metonymy and metaphor).

For **Unification**: Standardization and symbolization of unity.

For **Fragmentation**: Differentiation and expurgation of the other.

For **Reification**: Naturalization, eternalization and nominalization/passivization.

I will, throughout my analysis, argue that some of these strategies of symbolic constructions are to be found in the animal behavior-discourse in *Illustrerad Vetenskap*. The focus will lay on the strategy of *trope* (figurative use of language), and that of *naturalization*. Thus, I will provide a short introduction to these two strategies only, and give explanations to the remaining of Thompson’s modes and strategies when exemplifying them in the analysis.

Trope:

Trope is the figurative use of language, and is described by Thompson as a strategy mainly associated with the mode of *dissimulation* - the establishing and sustaining of domination by concealing, or deflecting attention from the power relations. Metaphor is one of many tropes, and can be explained as a strategy that “[...] involves the application of a term or phrase to an object or action to which it is not literally applicable” (Thompson 1990:63). By doing this, the use of metaphor may, with its many associations, prescribe individuals, relations or phenomena with characteristics they do not literally possess, and in that lays the *dissimulation* in the strategy. A certain kind of metaphor that is highly relevant in

my analysis is the *anthropomorphizing* metaphor (see e.g. Ganetz 2004; 2012), that is, metaphors prescribing animals with human-like attributes.

Naturalization

Naturalization is a strategy presented in the mode of reification, by Thompson described as a mode that represents state of affairs as if they were permanent, natural and outside of time (Thompson 1990:65). The naturalization is a strategy to treat a social and historical created phenomenon as inevitable and natural. To describe the division of labor between men and women as a product of natural characteristics is a typical example of naturalization.

The claim is by no means that these modes and strategies are the only ones through which ideology operates, or that the strategies can *uniquely* be associated with these modes. Rather, the aim is to highlight *some* possible ways and strategies through which ideology may operate. Last but not least, the use of terms such as “strategies” indicates that these symbolic practices are made consciously and with a certain explicit goal – to maintain power and domination. In other words, it indicated that I claim that the journalists of *Illustrerad Vetenskap* actively chooses to represent animals and their behavior in a misleading, and that they are doing this to maintain the gender system. That would, of course, be silly and meaningless to claim. I hence find it necessary to highlight once again that what I investigate in this thesis is the texts, the symbolic constructions, as such and not the intentions behind them.

2.4 Doxa, orthodoxy and heterodoxy

An interesting approach to ideology and language is to look at what is and what is *not* mentioned. In other words: what is assumed and taken for granted? What

is written out and what is not? These reflections can be connected to Bourdieu's (1972) concepts of *doxa*, *orthodoxy* and *heterodoxy*. Bourdieu (ibid:168) draws on a model where *doxa* is what is outside the universe of discourse that *orthodoxy* and *heterodoxy* is inside. While orthodoxy is the accepted and established ideas and opinions and heterodoxy challenge them, *doxa* is the beliefs, ideas and rules that are taken for granted to such an extent that they cannot (or at least are not) spoken out or discussed. Hence, it can be explained as what "goes without saying because it comes without saying" (ibid: 167). Drawing on this, one can say that everything that is explicitly stated out can be seen as something existing within the universe of discourse, whether it is orthodoxic or heterodoxic. On the one hand, one can assume that *everything* that is mentioned is something that in a way is at least slightly unclear and possible to challenge, since what everyone knows never must be said. Whether this kind of statements and ideas, in the description of animal behavior, are orthodoxic or heterodoxic of course depends on the context and what way it is described in. The description of a norm-following behavior might work heterodoxic if mentioned in a questioning way and orthodoxic if taken up in a positive way at the same time as the description of a norm breaking behavior might work heterodoxic if it is done in a positive way but orthodoxic if the abnormality of the behavior is underlined. One could view it as if many things that are explicitly written out in *Illustrerad Vetenskap*, are things that in a way are seen as abnormal, strange, because of the fact that they are at all mentioned and not taken for granted. On the *other* hand, mentioning this (assumed) deviant behavior/phenomena/etc. in a way prescribes it with a right to exist, and hence, depending on the context, serves to normalize it and thus works in the service of heterodoxy (cf Samuelsson 2008).

2.5 Sex, gender and feminist studies

I will not go deep into the complex world of the pluralities of feminist- and gender theorists and their different ways to view and explain sex and gender. My hope is that an adequate analysis that contributes to the field of gender studies can be made also departing from a quite basic view of sex and gender – viewing *sex* as an example of *one* type of categorization and stratification that is the base for dominance and inequality (cf. Thompson 1990). Though, I find a brief introduction to sex and gender being necessary.

Challenging the essential in sex is common in feminist theorists. As de Beauvoir (1968) suggested already some fifty years ago with the famous words “one is not born, but rather becomes, a woman” (1968:261) gender identity is constantly made in social practice, and not inherent in any human being (Butler 1990, Åsberg 2005) From this idea developed the concept of *gender*, the social and cultural sex, as an analytical tool in opposite to biological sex. Within natural science, in contrast, the categorization of males and females are based upon the size of the gametes. The biological definition is hence that a male produces small gametes while a female produces big (Andersson & Eliasson 2006:67).

With no doubt, the concept of gender as an antipode to the essential ideas of the biological sex has been fruitful in the progress of feminist theories and studies. *But*, what needs to be pointed out is that gender as an analytical tool depends on the distinction between *nature* and *culture* that most scientists now agree upon being unfruitful and not possible to make. Hence, the relation between sex and gender is more complicated than what it first may seem, and many feminist theories therefore now see it as not possible to determine what is the biological and the social sex, and thus claim that not only *gender* but also *sex* as such is constructed and performed (eg. Butler 1990). Claiming that sex is constructed does

not imply that it is constructed by the genitals as such, but by the enormous role they play in categorizing and organizing people. In other words, the construction is the choice of these attributes (shapes of genitals) as determiners of people's roles in society. I will thus, mainly to get a variation in my language, use the terms of *sex* and *gender* interchangeable in my analysis.

To sum up, gender, or sex, identity is not a constant, nor is it something that occurs in a vacuum. Although the gender categorization might be associated with structures that may seem difficult to change, it involves a continuous identification process that by many theorists is called “doing gender” (Butler 1990). Our social practices are at the same time determined by our social norms and determining the social norms/structures. The language can be considered a certain kind of such social practice, and here comes the relevance of this research – symbols and language and formulations influence our consciousness and our gender norms since it *is* a social practice (Fairclough 2001).

3 Background

The aim of this chapter is to present a background to the field; first a brief review of some earlier research, further some arguments for the role of natural science in the culture making process. That follows by a section with arguments for my use of mass media, and popular science and *Illustrerad Vetenskap* in particular.

3.1 Science, nature and animals in relation to gender

Marlene Zuk has a background in nature science and addresses questions similar to mine, perhaps mainly from a biologist's perspective. In *Sexual selections: What we can and can't learn about sex from animals* (2002), she lifts the great benefits in a possible integration of gender theory and biology. One of her main points is that we cannot learn much about gender roles from animals. Rather, she claims that instead of feminism having a lot to learn from biology, biology has a lot to learn from feminism. Trying to determine the natural human sexual behavior from the interpretation of animals' behavior is not very fruitful since that question requires a clear distinction between natural and cultural behavior, something that at present is rejected by most scientists. Even amongst biologists, Zuk (2002) argues, it is now more or less generally accepted that it is in most cases neither possible nor meaningful to try to distinguish between "natural and nurture" reasons for particular traits on animals. To use the animal sphere as a kind of template, whether it is about arguing for a "queer nature" or confirming traditional gender roles, is thus something Zuk argues should be avoided. Biology, on the other hand, according to her, has more to gain from bringing in a

feministic perspective into the field. To get a deeper understanding of animal behavior biologists *has* to bring in the critical self-reflexive perspective on how predetermined gender ideas has influence on the interpretation.

The famous feminist and science historian Donna Haraway (1989) approaches the field from a more constructivist angle. In her book *Primate visions: Gender, Race and Nature in the World of Science* she addresses the issue of the relation between natural science and feminism from an angle that doesn't imply, as Zuk's (2002) work to some extent can be said to do, an aim to try to reveal the bias in animal behavioral studies. Her approach to the natural science material is thus less normative, while it is not saying what is good and bad views on nature and animals, but rather viewing all science as culturally constructed.

These two brilliant feminist theorists were my first and main sources to inspiration in the process of coming up with research questions. From them I bring with me the conviction that my research question is relevant and important within gender studies. Also Swedish research in this field has been made. The zoologists Andersson & Eliasson (2006) conduct research on gender stereotypes in animal science, and the gender researcher Ganetz (2004) looks at how gender is performed in nature movies. Åsberg (2002; 2005) investigates, from a gender perspective, how genes are presented in popular science magazines while Samuelsson (2008) researches the construction of reality in natural science museum exhibitions.

What these studies have in common is that they all concern the relation between imaginations of nature and the social world. Let me now get in to that relation a little deeper.

3.2 Nature versus Culture

The western society is to a great extent built up on categories and dichotomies. One of the most important of these binary oppositions is the nature-culture dichotomy (Lévi-Strauss 1966, Ortner 1974). My own thesis is an example of this dichotomy. The view of nature as independent from culture is actually a vital prerequisite to the idea of the *objective* science (nature science).

Instead of joining the group that tries to disentangle the questions of the reason to the great importance of science, let me once again conclude that there *is something* about science and it *has* an extremely significant position in the Western society. A classic example of natural science leading to a great shift in people's consciousness is Darwin's evolution theory. Martin (1990) describes this process and the interaction between social and natural science in her amusing article about how gametes are given personalities and gender in popular illustrations. Darwin's *Origin of Species* was initially influenced by the social theorist Malthus' ideas about population. His new description and analysis of the natural world could then directly be applied on social science as what we call *social darwinism* as an explanation of the social order. Martin (1990) draws parallels from this to her own research:

“What we are seeing now is similar: the importation of cultural ideas about passive females and heroic males into the “personalities” of gametes. This amounts to the implanting of social imagery on representations of nature so as to lay a firm basis for reimporting exactly the same image as natural explanations of social phenomena.”

(Martin 1991:500)

Let us now leave the field of natural science and zoom out to a broad discussion of mass communication, to later narrow down to a description and discussion about popular science magazines in general and in particular *Illustrerad Vetenskap*.

3.3 Mass media

My starting points and arguments for choosing to investigate a magazine in general and *Illustrerad Vetenskap* in particular is partly based on Thompson's (1990;1995) ideas and thoughts concerning mass communication and its relation to ideology. A popular science magazine like *Illustrerad Vetenskap* can quite uncontroversial be defined as a kind of mass media. Mass communication, Thompson points out, is "[...] the institutionalized production and generalized diffusion of symbolic goods via the fixation and transmission of information or symbolic content" (Thompson 1995:26). This definition goes far beyond the perhaps general view of mass communication as including newspapers, magazines, television and radio and not much more. Actually, with Thompson's definition all kinds of techniques that fixate and stores symbols can be considered a mass communication media, even for example the Swedish runes or a painting on the wall. Thompson (1990) claims that theorists have to a large extent failed in paying adequate attention to the importance of mass media in the construction of ideology. He underscores with many arguments why mass communication plays such an important role in today's modern society. This is only one of them: "It is only in the development of mass communication that ideological phenomena could become *mass* phenomena, that is, phenomena capable of affecting large numbers of individuals in diverse and segregated settings." (Thompson 1990:19). Although 25 years have passed since Thompson wrote the text, the main point still holds that mass communication has a great impact on

how people view the world and deserves thus to be studied from a variety of angles and perspectives.

Likewise, Möllerström, Sandberg and Ringsberg (2013) pinpoint the role of mass media in society. One of their claims is that the influence of media is smaller (on individual level) in a case where the individual perceive herself to possess a high level of knowledge within the topic. However, whether the individual adapt to the mass media information or not, in a direct way, it still contributes to the production and reproduction of myths and ideology. This is due to the fact that the media is at such high level interwoven in people's life. (Thompson 1990; Möllerström, Sandberg and Ringsberg 2013). One can thus assume that even if a magazine like *Illustrerad Vetenskap* might have a smaller direct influence on individuals from e.g. the scientific world it still *does* affect the discourse and lifeworld of scientists as well as other people.

It is important, when using a term as *mass media* or *mass communication* to point out that the term itself can be quite misleading. What is for example a *mass*? Thompson (1990:218) claims that the information doesn't necessary has to be spread to a great quantity of people in order to be a part of *mass communication*. Rather it is about the media's *possibility* to reach a plurality of receivers. Also the *communication* in mass communication is problematized by Thompson, since it doesn't really imply that much interaction that we usually associate with *communication* (ibid). To call it *transmission* of meaning instead of *communication* would thus perhaps be a better description. Although the interaction between "sender" and "receiver" is limited in mass communication the receiver should, as earlier discussed, by no means be seen as passive. First of all, one kind of interaction exists in that the reader is a consumer of the media information and could choose her/himself whether to continue to take part of it or not. Second, the individuals that receive the media message are constantly active

in understanding and interpreting the message. This is what Thompson (1990:25) call *the process of appropriation*, a process with aim to make sense of the message and at the same time make sense of the identity of the individuals themselves through the message they are processing.

Last but not least: Even though one can stress, as I do, that mass communication such as magazines and broadcasting television is a highly important medium of ideology in today's society, I do not want to give it the importance of being the *only* medium of ideology. As Thompson (1990:20) also concludes: ideology operates in different kinds of contexts in the society – also contexts where mass communication is not involved.

3.4 Popular science

Let us now narrow down by bringing together the two wide concepts of mass media and natural science into the certain kind of media that this thesis aims to describe – a sort of media that is commonly called *popular science*.

Popular science is a genre that claims to mediate science to the people outside the university and to describe science in a language that is understood by everyone. In other words – it can be considered a genre that is a mix of science and entertainment (Ganetz 2012) or, to complicate it a bit: “mediated, entertaining representations of science for an *imagined* community of audience” (Åsberg 2005:37 writer's translation). The term and genre *popular science* is obviously not a clear and defined category, neither a term that is unproblematic to use. First of all, it indicates that *science* is something that exists isolated outside the cultural world and is mediated to the people in popular media. Swedish magazines such as *Illustrerad Vetenskap* and *Forskning och Framsteg* claims to be this link in the gap between science and society. This link can though be said to

be an imagination (Åsberg 2005); an imagination that is vital for the very existence of the popular science genre. This is reflected on by Åsberg (2005) who, inspired by Haraway (1989), draws parallels between popular science and science fiction: “popular science and science fiction have a lot in common, such as the aesthetic conventions and the way they always portray 'science' as if it were its own isolated world with almost magical connotations” (Åsberg 2005:41, writer’s translation).

Let us conclude that not only the *science*, but also the *popular* part, of popular science is difficult to define. Popular culture holds a heterogeneity of expressions and is made differently in every media (Åsberg 2005:39). An aspect of *popularity* that may be easier to grasp is the number of receiver the certain media reaches. Concerning *Illustrerad Vetenskap*, it is a *popular* science magazine also in the sense that it is sold to a large number of people; it is, according to AdSales Group (2016) the most sold monthly magazine in Sweden. On the other hand, popular science, and especially what is seen as the *popular* part of it, hasn’t been given a high value according to “prevailing good taste” (Åsberg 2005:39). There has even been a discussion about whether this kind of media can be misleading in the sense that the people wouldn’t be able to grasp it in a correct way. (ibid:37)

There are more reasons to claim that *popular science* is difficult to define and distinguish from *science*. As Åsberg (2002:39) highlights, popular science journalists seem to increasingly take part of pure science projects at the same time as people who has been seen as scientists take place in more journalistic spheres.

Science’s, popular science’s and pure fiction’s (if that categorization is possible to do) representations of animals all play an important role in how we perceive

and categorize nature, culture and ourselves (Ganetz 2012; Åsberg 2005; Hara-way 1989). Disney's anthropomorphism in for example Bambi and The Lion King has changed the way we look at deer and lions, hunters and victims and good and bad. In particular, Bambi has to a great extent been problematized, not only within cultural studies, but also from groups in the society who argued that they weren't portrayed in a fair way (e.g. hunters). Also others highlighted that Bambi contributed to a totally "incorrect" picture of nature (Lutts 1992).

Natural scientists took a clear stance against this kind of images of animals, and what can almost be called a taboo for using human metaphors in descriptions of animals rose within the scientific sphere (Gålmark 2005). This led to, stresses Gålmark (ibid) a rejection and denying of phenomena that showed what human and animal have in common. She actually claims that one can talk about "culture" and "feelings" even for animals, but that science on this field has been neglected because of the general scientific discourse of animals as *not* similar to human, as an adverse reaction to e.g. Disney's nature portraits.

Except the fact that the article writers in the magazine that I have investigated, as well as the scientists whose research is the base for the popular articles, are human beings with preconceptions like anyone else (influenced e.g. from other mass media and fiction images), another reason for not coming up with ideas that goes against generally accepted worldviews might be the fact that media such as *Illustrerad Vetenskap*, like most other magazines, is dependent on its commercial success (Åsberg 2005; Thompson 1990; Ganetz 2012). It is not controversial to assume that the buyers of the magazine don't find it comfortable to achieve information that goes against everything they believe in. At the same time, and this is something that is highly visible in *Illustrerad Vetenskap*, the sensational sells. A difficult balancing act can be discerned here – an aim of surprising the reader while at the same time not question his/her ideas too much.

According to AdSales Group (2016) the readers of *Illustrerad Vetenskap* are 60% men and 40% women with an average age of 46 years. In an attempt to try to discern the target group of *Illustrerad Vetenskap*, my first intuition after looking through some magazines and the web page was that this is a magazine that with no doubt addresses mainly men, (with no or low academic education). The layout with dark colors and “splashy” pictures as well as what I consider an absurd fascination of “the dangerous” – “monsters”, predators and so on, can be linked to traditional manly preferences, which has also been discussed by e.g. Åsberg (2002;2005). Thus I actually became slightly surprised when I did not find any explicit information, e.g. on the webpage of the magazine, specifying the target group as middle aged men.

A strong positivistic narrative can be discerned as a theme throughout the whole magazine. A not uncommon framework of an article is to present a number of claims and label them either true or false. The connection to science is important in order to keep up the authenticity and legitimation of the articles (Ganetz 2005). But this connection is apparently not so obvious that the reader doesn't have to be constantly reminded of it throughout the texts. The words “science” and “scientists” (Sw: forskning, forskare, forskarna) are used in an almost unproportioned way in more or less all sections of the magazine. Though, names of the scientists that are described in the magazines are, as far as I have found, almost never mentioned. Instead they are often labeled *the scientist* (sw: forskarna), in definite form as if they were members of a homogenous community which members are not necessary to call by name. Not only the scientists are anonymous, but often also the authors of the articles. In the sections with small notices and answers of questions the name of the writer(s) are not visible and in the longer articles you can see the name of the writer with small letters under the preamble.

One can spot a balance act between the “science” and “popular” that is not always unproblematic for the editors (and readers) of *Illustrerad Vetenskap* (cf Ganetz 2004:198). In the section with letters to the editorial staff, in one edition, the journalist defends the fact that IV does not publish scientific articles; rather they present science in illustrated and “popular” ways (2015/3:8) In the same section in another number (2015/2:6) a reader is discontent with an article about aliens in a previous number. *Illustrerad Vetenskap*, the reader stresses, is a “serious magazine” and should *not* write about speculations.

My first experience of the magazine was actually a feeling of low credibility. It is reasonable to assume that this is connected to my education at master’s level, with more focus on social than natural science. Åsberg (2005:38) concludes that *Illustrerad Vetenskap*’s reputation in scientific contexts is rather bad. *Illustrerad Vetenskap*, as she puts it, would hardly “count as an academic merit to publish in” (Åsberg 2005:38, writer’s translation). This is of course important to bear in mind throughout the analytical process of the articles. But my instinct to consider the magazine and its articles as bad is something that I have to try to go beyond.

4 The reading

Here, I intent to argue for how different strategies of symbolic construction are used in service of domination and how doxic, orthodoxic and heterodoxic conceptions of gender can be discerned in the texts, by showing examples from texts within different themes concerning mainly the *Illustrerad Vetenskap*'s representation of the sexual reproduction of animals.

4.1 Explicit and implicit gendering of animals

The represented animals in *Illustrerad Vetenskap* are in many of the studied texts described in gender neutral terms. That means that descriptions such as “the male” or “the female” or the pronouns “he” and “she” are relatively rare in texts that do not directly concern animals' sex. In sentences where I personally would consider it most comfortable to write “he”, “she” or “it”, the original words (eg. “the lion”; “the whale”) are often used repetitive times. This could be interpreted as a way to de-humanize the animals; to keep them away from the human characteristic of possessing a gender identity and being referred to with personal pronouns. Though, I would like to claim that this does not make the animals in *Illustrerad Vetenskap* non-gendered. I will argue for that with providing an imaginary example: Let's assume that a certain activity, for example hunting, is described as performed by a non-gendered, or even female, individual. Though, it can still be used as a description and construction of masculinity. That is because the activity may be so deeply rooted as a male activity that the reader of the text makes up a logic of prescribing the female hunter with masculine attributes instead of giving the activity feminine associations (cf. eg. Jonsson 2012). In other words, the preconceptions that the reading subject has and/or

is expected to have, concerning e.g. what kind of activities are associated with which sex, interplays with the text in making up the gendering-story (Thompson 1990; Fuss 1989). One could also say that these kinds of gender ideas to some extent and to some people are “doxic”. Sometimes, as I will focus on most in the later sections of this thesis, the text helps the reader with giving explicit information of what and how a female/a male is. Sometimes the reader is free to gender the animal herself, and sometimes the text helps out with mentioning *en passant* what sex it describes. The latter is a phenomenon that I have found a couple of examples of; texts where for example an animal attribute is first described as general for the species but later turns out to consider one sex only. Below are two examples:

Why do lazy lions have big muscles?

Lions have got big, strong muscles, although they rest between 18 and 20 hours a day. The phenomenon may be surprising – especially since we humans would become slack and weak if we lied down 75 percent of the time. The explanation is that lions, unlike humans, have been equipped with big muscles. Male lions exercise through fighting and chasing away other males from the territory. The fights with other lions are hard work and keeps the lion in good shape.

Illustrerad Vetenskap 2015/3:72

Preamble to the article: ***The world's fastest animals***

Hunt, escape and show for females. Animals have many good reason to increase their speed. In-built oars and non-slip soles are some of the qualities that comes with success and make some animals nature's fastest: - on land – in the sea – in the air.

Illustrerad Vetenskap 2015/5:44

Both of the texts are examples of naturalization strategy since they emphasize the similarities between humans and animals, the first one by explicitly highlighting it as “surprising” that the lions’ muscle functions work differently than humans’, and the latter one partly by using metaphors such as “oars” and “soles”. Words that are commonly used to refer to human tools are here used in order to describe physical attributes of the animals. This use of language prescribes the animals with human characteristics and may possibly serve to establish the picture of the animals as the “natural human”.

The other thing that these texts do is letting the male individuals represent all individuals of the species. Both these texts claim to regard animals in general, and not males in particular. In the lion-text it becomes clear to the reader not until the second last sentence that the question and answer is regarding the *male* lions. The latter text does the opposite; starting with stating out that the males are regarded, implicitly by exemplifying with “show for females” and then broadens out to regard animals in general terms. The first sentence in the preamble places the whole text in a masculine context. This can be considered a part of the strategy of trope that is called *synecdoche* (Thompson 1990:63), e.g. the use of a term for the whole to refer to the part or vice versa. In this case, the whole refers to the part; “lions” refers to “male lions” and “animals” refers to “male animals”. This figurative use of language may, according to Thompson (1990) work dissimulating in that it confuses or glosses over relations between wholes and parts, in this case – between *all* lions and the *male* lions.

One way to interpret the reason of this phenomenon is that male is the non-gendered gender, and that it hence is not necessary to specify the gender if is not deviant (in other words: if it is *not* male); That doxa is, in this context, that the male is the normal individual. This explanation is though not really sufficient in this case since there are examples of the same phenomenon where it instead is

implicit that the text regards a female individual. The reader is expected to be able to gender the described animal given the information of the animal's attributes and activities in relation to the context it is acting within. If you are still not able to identify the sex of the animal, you do not have to worry - just wait for the right answer that comes later in the text:

Extract from ***Watch out for upsetting the tough of the deep sea:***

At the same time, the whales have developed both a complex social culture and advanced forms of communication. The female sperm whales organize in women's cooperatives with up to 14 females. While one of the females is diving for food, the other single mothers keep an eye on her baby. Every flock also has its own language of clicks that differs from the language of other flocks.

Illustrerad Vetenskap 2015/4:26

This text is found in a rather long article that mainly concerns the strength and danger of the (male) sperm whale. Suddenly "the female" is mentioned, and that as carrier of the social characteristics of the species. What starts with "the whales have [...]" narrows down to regard females in particular. The paragraph then ends with zooming out to the general again; "Every flock also has [...]". The same figurative use of language, a synecdoche, is used as in the texts above, with the only difference that in this case a female is given the honor to represent the species. The reader is hence implicitly expected to have a preunderstanding of communication, organization and child care as linked to the feminine sphere.

I choose to see this phenomenon as a sort of semi-explicit gendering, since the animals *are* gendered but in a rather subtle way. Relating to Bourdieu's (1977) concept of *doxa* I would like to follow Thurén (2003) in talking about a *scale* of doxa. Ideas are perhaps not *either* doxic or not, but rather more or less doxic and that becomes clear when I reflect upon these texts. The ideas of what attributes

should be associated to “a male” or “a female” are *almost* taken for granted, but not to the full, since it has to be cleared out.

4.2 Seduction

Concerning the representation of animals’ sexual- and reproduction behavior, I find the first step, the choice of partner or what I call “the seduction”, perhaps most interesting. Within the discourse of sexual selection, the idea of female individuals able to take own tactical decisions concerning their sexual partners was, when first presented, quite controversial. The hegemonic idea was instead that sexual selection was made *only* through competition *between* males, and that a male could take whatever female he wanted, as long as the other males allowed him (Andersson & Eliasson 2006). Nowadays, the story of the actively selective, picky, female is perhaps the most established one. This comes with other kinds of difference-creating stories about the sexual selection.

My main interest in the study of the seduction is to look at *who* is tempted by what and what are presented as advantageous to whom. In other words: Who seduces whom? The first pattern I noticed in the texts was an image of both males and females as quite gullible when it comes to the mating act, but in different ways. While the females seem to let themselves be tricked *to* mate, the male seem to be tempted *with* mating to sacrifice other things. In other words: mating is the *reward* for the males but the *sacrifice* for the females. Here, in an article concerning animal’s ability to construct complex buildings, is an example that expresses the latter:

Bird entices with nice house and garden

The bowerbird is a real master in decorating, and when the male is looking for a partner he fights hard to outshine his rivals. The bowerbird doesn’t live in permanent pair relations and the male does not help with neither nestling nor

hatch eggs or raise offspring. The only thing he contributes with is his genes. Thus, the females are extremely picky in the choice of partner. In the attempts to catch a female the male constructs a lovemaking nest that is similar to a bower. First he builds a place that is well decorated with for example flowers or berries, sorted by color. Some species build a kind of maypole from sticks instead of a bower. The pole can be more than two meters high and decorated with garlands of larva excrements. When a female let herself be lured of the male's masterpiece and lands by the bower, he dances for her as a warm-up for the copulation.

Illustrerad Vetenskap 2015/1:44

This text is full of metaphors with associations to humanity; the male “decorates”, makes a “love making nest” and “dances”, to only mention some of them. All these metaphors contribute to draw parallels to, create similarities with and thus to naturalize the hegemonic gender roles within a picking up-culture amongst humans in western societies. The statement of the birds *not* living in “permanent pair relations” is first yet another metaphor, but may also say something more. The fact that it is stated out explicitly can, as discussed briefly before, be considered a way to highlight the phenomenon as something “strange” and different from humans. At the same time, the statement may be considered orthodoxic and serving to naturalize and normalize the phenomenon of a male with the only task to deliver his sperm, particularly since no further detail is considered necessary to mention about the phenomenon, and also the fact that the birds in so many other ways are portrayed as similar to humans.

Another strategy of symbolic construction I have identified in this text is that of *rationalization*: legitimating a phenomenon by explaining it with a chain of logic reasoning (Thompson 1990:61). It is implicit here that the male's goal is to mate – to spread his genes – and that all his work (with constructing the

bower) is rational to reach that goal. The female on the other hand is “extremely picky”, as explicit mentioned, when it comes to mating, and her implicit restraint is explained by the little input given by the male. Given that, she is represented as to a great extent *active* in the choice of partner. The activities and behavior of both individuals are hence portrayed as logic and rational at first sight. But something is missing in the description to explain the female’s choice as rational. If it is so that she must be really careful in choosing the right genes, what does the well decorated flowery bower give her? The picture of the female is a paradox – at the same time as it pictures her as an individual that makes an active and rational choice by describing her as fastidious, it also describes her as someone who lets herself be lured to sex by posh decorations, flowers and berries. Her preferences to the aesthetics is taken for granted and not at all linked to her goal that is, implicit, to find the male with the best genes.

Åsberg (2002:25) points to the representation of a phenomenon similar to what I have identified in this text, and call it that the males are portrayed as they are “showing off”. Within the description of the sexual activity as an economic transaction, the males have to be salesmen trying to show off for the choosy buyers (the females). According to Åsberg (ibid), the phenomenon of human art, performed by men, is within this discourse seen as a bi-effect of this selling-off-activity. The image of the male artist can obviously be discerned in the description of the bowerbird; he seems to have a talent for decorating and matching colors in a way that is appreciated by females. The female on the other hand, as mentioned before, is the audience, the one who without closer reflection lets herself be hypnotized by the art. An alternative picture of the female, that is not given here, would be as the active viewer, the critical reviewer who possesses the knowledge to distinguish between good and bad art.

Not only the females but also the male are portrayed as gullible when it comes to sex, but there is an important difference in the descriptions of what they are tricked *with* and tricked *to*. In the case of the bowerbird text above, the female let herself be charmed by a bower and thus sacrifice her sexual restraint. In other words, sex is her sacrifice and the bower is her reward. To the male on the other hand, the bower is the sacrifice and sex is his reward. In the two texts below, females are presented as strategically users of males' willingness to sacrifice for sex:

Is there prostitution in the animal kingdom?

Scientists have, among some animal species, registered behaviors that can be called prostitution, because the females let the males mate with them in exchange of different advantages. Prostitution among animals was first discovered among adelic penguins in the end of the 1990's. The scientists recognized that some females were willing to mate with other males than their permanent partner – if they in return got a stone to build a nest with. Stones are highly valued in the penguin colonies since the stones are not enough for everyone. A similar phenomenon has been studied among chimpanzees, where females mate with foreign males in exchange of food. The explanation of the phenomenon may be that the males take every chance to put more offspring to the world, while the females test the males as potential future partner.

Illustrerad Vetenskap 2015/9:72

This text tells the reader that to be willing to mate with other males than "their permanent partner", there need to be other incitements for the females. In other words, there is no intrinsic value in *mating* for a female – mating is the sacrifice. The males on the other hand seem to be unreflectively willing to sacrifice for sex; the implicit message here is that sex is, to a male, even higher valued than "the highly valued stones" or food. The main metaphor here, I would argue, is

that of “prostitution”. Giving the animals’ activity that label definitely prescribe them with human characteristics, such as the ability to trade, to bargain. The text persuades the reader to believe that the phenomena of prostitution amongst humans is something that is not socially and historically constructed but natural. In other words: yet another example of how the strategy of *naturalization* is used.

Hungry praying mantises tempt males to sex

Starvation makes the female praying mantises apply a paltry trick. They tempt the males with sex but instead they bite their heads off and eat them up. That is showed by an Australian experiment with female praying mantises in different grades of starvation. The most starving attracted 25 males, while the fattest only attracted 15 males. The other females pulled between five and ten males each.

Illustrerad Vetenskap 2015/8:11

Also in the representation of the praying mantis, sex is the sacrifice for the female. The difference here is though that she is presented as smart or mean enough to be able to get away without having to sacrifice. The picture of the males in both these cases are pictures of quite stupid and vulnerable individuals who let themselves be hypnotized by their sexual drive; individuals who “take every opportunity to put more offspring to the world”. The females on the other hand are portrayed as smart, but mean, scheming users of the males’ vulnerability.

4.3 On who’s initiative

In this section I will continue to scrutinize the picture of animal’s sexuality, now with focus on the differences in described activity/passivity amongst male and females.

Fishes performed the world's first intercourse

Paleontology. *The intercourse 'was invented' by a primitive fish species, about 8 centimeters long and living about 385 million years ago. That conclusion is drawn by an international research team that in detail has studied an extinct, armored fish. The fish lived its life in lakes in, among other places, what is now Scotland. The fishes mated while they were positioned next to each other. In that position the male could easiest maneuver its genitals into the female and commit the world's first internal fertilization. That is explained by one of the scientists behind the finding, the paleontologist John Lang from the Flinders University in Australia. The fishes' small "arms" helped the male to keep the position during the act.*

Illustrerad Vetenskap 2015/4:12

Insects play "catch me if you can!"

When the horsefly is about to impress a mating-ready female, it can come up to a speed on up to 145 km/h. The male with a weight on only twelve milligrams overpowers the female in the air. While they both fall to the ground, they mate.

Picture with caption: *The male horsefly overpowers the female in the air. Then they mate during the fall.*

Illustrerad Vetenskap 2015/5:51

Both of the texts above represent a mating situation between one male and one female. I would here like to pinpoint the way in which the texts changes in who they present as the active subject. The fishes, in the first text, "mated while they were positioned next to each other". So: the action is first described as something mutual with both actors equally active, but that changes rapidly. In the next sentence, the female seems to be totally passive in the reproduction situation. The male is not only the one who "maneuver its genitals into the female" but also the one who commits the entire internal fertilization. Can we imagine a

different representation of this act? Can we imagine the female *putting her vagina onto the penis*? Hardly.

The latter text changes in the same way between describing the action as mutual and on the male's initiative. First, the male horsefly reaches a high speed to impress the female, then he overpowers her in the air (which is apparently necessary even though she is impressed) and lastly, *they* mate while they fall to the ground. The female's mind seems to change very rapidly from being reluctant (since the male must overpower her) to willing to take part in the mating activity.

My interpretation in this case is that these two texts do not differ much in this aspect. None of them describe the female as the *only* active part, but as either passive or mutually active together with the male. What characterizes the sentences where the act is described as consensual and mutual is that it happens at a time when the act has already started, even though the first text doesn't describe the procedure chronologically. The first step is though taken by the male alone; *he* is the one who puts the penis in. When it is already there, the female seems to accept the situation and choose to take part of it. In the case of the first text, the male is also the one who alone is active in the last step of the intercourse; making sure that the fertilization is done by putting his sperm into the female body.

What I would like to argue that I have found in the texts above is once again the strategy of naturalization. The texts naturalize a phenomenon and idea of the female as initially skeptical to sexual activity but that later changes her mind.

There is also a sort of *passivization* discerned in these texts. Even though the texts are not grammatically written in a passive form (that would be e.g. "the mating act is being fulfilled"), there is still a sort of passivization of the female

since she is present in the text but seldom described in terms of what she is *doing*, i.e. as the active subject. This does, one could claim, present the female as incapable of making active decisions, and hence may serve to establish and maintain that idea even amongst humans.

4.4 The penis and the non-penis

The world is full of penises. Both real ones, since many of the world's individuals have what is considered being penises, and representations of them. One could claim that this is something most people are used to and often don't even notice. Meanwhile, we most often don't reflect upon the fact that the representations and descriptions of the *vagina* are not even close to the grade of penis representations. When I started to notice all the penises in *Illustrerad Vetenskap* I couldn't stop seeing them. I saw them everywhere, and they were described and pointed out to clear out any hesitation about whether it was a penis that was described or not. A very interesting theme on (human) sex in number 7 (2015/7:50-57) is an article that I want to mention as an example of this. The article is eight pages long and regards myths about sexual intercourse. The article never states to be gender specific, but to regard sexual intercourse in general. But it is not about sex in general. It is in particular about the penis. Within the eight pages you can find items regarding how the look of your fingers determines the size of your penis, how the length of the penis vary in different countries and which grade of inclination on the erection is most common. The description and representation of the woman's external genitalia is, at least in relation to the representation of penises, more or less non-existing throughout the whole article.

I have identified this focus on the male genitals in the descriptions of animals'

reproduction and sexual life as well. Below, coming back to the text about the world's first intercourse:

Fishes performed the world's first intercourse

Paleontology. *The intercourse 'was invited' by a primitive fish species, about 8 centimeters long and living about 385 million years ago. That conclusion is done by an international research team that in detail has studied an extinct, armored fish. The fish lived its life in lakes in, among other places, what is now Scotland. The fishes mated while they were positioned next to each other. In that position the male could easiest maneuver its genitals into the female and commit the world's first internal fertilization. That is explained by one of the scientists behind the finding, the paleontologist John Lang from the Flinders University in Australia. The fishes' small "arms" helped the male to keep the position during the act.*

Illustrerad Vetenskap 2015/4:12

Next to the text are two pictures of what I assume is representing fossils of the fishes. One is labeled "male" and one "female". Next to these pictures, to the right on the page is an animated picture of a group of fishes, with two of them in focus committing "intercourse". **An arrow in the picture points to a spot on the male individual with the text "the male's genitals".**

In a later number (2015/10:6) the answer to a reader's letters to the editors concerning this article, is as follows:

The fished that we write about belongs to the so far oldest known specie with male genitals that is put into the female to fertilize the eggs. That does not imply that they are the first individuals with this attribute, and the scientist has neither fount the precursor. It is still unclear how the genitals have arisen

The penis, the male genitalia, is pointed at and clarified with an arrow. It is not called “penis” but “male’s genitals”, perhaps because it is considered not having enough attributes that people normally associate to the word “penis”, but still it is existing and explicit mentioned – one time in the illustration, one time in the main text and two times in the answer of the reader’s letter. In contrast, the female genitalia are never mentioned. The female is instead treated as if the whole individual was a genital: “In that position, the male could easiest maneuver its genitals into the female”. Note here: the male does not put his genitals into the genitals of the female but into the *female herself*. There are other examples of this, one is where the barnacles with the “world’s longest penis” is described. A text with an arrow points to the illustration saying: “The penis of the male is extremely long in order to be able to reach the female”. Once again, the penis is not reaching for the female vagina, or the female genitalia, but for the female as a whole. This use of language can be seen as a sort of *trope* that reduces the female’s attributes to the attributes of her vagina only, in contrast to the male, whose genitals are described as a *part* of the male.

Further, in the answer of the reader’s letter the species is described as the first one with male genitals. The physical attributes of the female related to her reproduction system was either not defined as genitals or not considered important enough to mention. This text, about the world’s first intercourse, is what I consider the perhaps clearest example of this phenomenon; the phenomena of presenting the male genitalia as the only actual genitalia, since it claims to describe a reproduction situation where both a male and a “emale are included. The illustration shows *both* a female and a male in a reproduction activity, but *only* the male genitalia are labeled. And, there are more examples of *Illustrerad Vetenskap* helping out to answer the question: “where is the penis?”.

One possible explanation to this is that there is an image of the penis as the most important part of the body, and that it thus deserves the most attention. This text, from the article “the penis of the lizard develops fast”, is an almost too obvious example of that:

Some body parts are more important than others. At least, biologists have found out that genetic changes in size and shape of a lizard's penis happens six times faster than of other body parts.

Illustrerad Vetenskap 2015/8:14)

In addition to that, one could stress that the reader as a subject is positioned to take the male's standpoint; a man for whom the penis is unreflective and obviously the most relevant sexual organ. In other words, the ideal reader is a man, or supposed to take a man's perspective (cf. Åsberg 2005), and for this man the penis is relevant and the vagina is vague. Given that there exists an illusion of a human vagina as something with an unclear and uncertain position, function and anatomy, one could stress that there is little need for clearing it out concerning animals in *Illustrerad Vetenskap*; the vaginas there are just as unclear and vague as on the human body. The penises on the other hand, from this way to view it, are a highly concrete and material matter on the male body. In every case where penises similar to what we expect them to look like are presented there is hence no need to clear anything out. The need to point them out comes when they *don't* act like/ look like/ are located where we expect them to be. We still want to consider the male animal's reproduction organ a “penis” and it still *is* the most relevant reproduction organ, but, someone just need to show us where it is. If not, it would become just as vague and unclear as a vagina.

4.5 Family and childcare

In this section I intend to take a closer look at how the last part of the sexual reproduction, the care for the offspring, is represented and analyzed in my texts.

Samuelsson (2008) reflects upon the repetitive clarifications in exhibition texts about male deer being absent in the child nursing activity. As discussed earlier, she also provides us with two different interpretations of this repetitiveness; one is that the repetition justifies the phenomenon (of an absent father) and gives the audience a message about the normal. The other way to view it is that it is in some way seen as a problem, something deviant, and thus something that needs to be pointed out and repeated. My standpoint is that what is most obvious and established is seldom explicit mentioned. We rarely see statements like “the female doesn’t eat her babies after giving birth to them” because that is something we do not expect her to do; it is barely an action that we see as an option. With this I would like to claim that the idea about the nuclear family, for animals as well as for humans, gets visible in the highlighting of the absence of a “father”. The phenomenon is, if though not rather controversial, not so accepted that it doesn’t need to be said. The ideal is a family with a mother that has the main responsibility for the direct child nursing, a father that “helps out”, and children. Anything that goes outside that norm is considered “different” to some extent. I have found representations of both female and male absence in childcare in my selection. Both are, I would stress, presented as a “problem”, but the scale of the presented problem differs depending on if the absent individual is a male or a female. Let me provide you with an example consisting of two different texts:

Capture to photo spread: *Dad broods the eggs in his mouth*

Life as a single father is not always easy – especially not for the cardinalfish. The female just put her eggs next to the male and leaves the rest to him. To protect his offspring against predators the male place all the eggs in his mouth after

fertilizing them. Before the eggs are hatched he is hence not able to eat anything – except the eggs he accidentally swallows during brooding.

Illustrerad Vetenskap 2105/9:8-9

Extract from: *Occupied – entry forbidden!*

When a male has delivered his sperm he can more or less forget everything about the sperm cells and not care about what happens to them. Though, the males of some specie put some extra effort into making sure that the sperm cells of other males do not meddle with the process

Illustrerad Vetenskap 2015/12:32

These two texts represent actions of absence in parenting - one of them the absence of a mother and the other one the absence of a father - though the context in which the actions are described is on an early stage of reproduction (before the babies are born). I would like to claim that the extent of problematizing around the absence differs largely between these two texts. That the mother of cardinalfish “*just*” puts her eggs next to the male indicates strongly that she is expected, from the reader’s perspective, to do something more. The absent father on the other hand, described in general terms and not specified to a specific specie until the exceptions are presented later in the same text, “*can*” forget about what happens to his sperm cells “*though*” some males put some extra effort into following up what happens to them.

The difference of problematizing is also found in the description of consequences for the parent that is left to nurse the offspring alone. How the females in the latter text manage to take care of the children without any help from the father is apparently not considered necessary to go deeper into, which implies that it is in a sense implicit that child nursing is their natural task and that they hence will manage just fine. On the other hand, the “single father” represented

in the first text is almost portrayed as a martyr. His life is explicitly described as “not easy”, and the act of keeping the eggs in his mouth is pictured as a real sacrifice. Even when he eats some of his eggs up, it is portrayed not as a part of surviving strategy (since he’s starving) but as an “accident”.

At the same time, every example of information about norm breaking phenomena may in a way serve to normalize these phenomena. This obviously differ depending on context and the extent to which the phenomenon is described as abnormal, but at least it is presented as an option to some extent. Coming back to Samuelsson’s (2008) two different interpretations of the highlighting of absent parents: Perhaps we need to combine the two interpretations and view it as they both operates at the same time, with and against each other. Shortly: the phenomenon is presented as to some extent deviant, but the fact that it ~~though~~ is described at all contributes (depending on the context) to a normalization of the action.

Another way to analyze how the norm of nuclear is expressed, is to look at how the categorization is made in the representations. In other words: what group constellations are considered being families and what are not? I would first like to underline that the label “family” is quite seldom used in my analyzed texts, but I have found some examples that I would like to investigate further.

Extract from: *Birds live in social dwellings*

But when you come closer, an artisanal woven large cooperative housing appears to you. Its habitants live together in pairs, with their own nest and own entrances. The weaver birds’ common nests can house up to 100 families that consists of 400 individuals and are constructed so stable that many generations can use it. [...] The birds live inside the nest side by side in apartment complex.

Illustrerad Vetenskap 2015/1:47

Extract from: *The subterranean cities of the prairie dogs*

The rodents live together in extended families with one male and up to five females, that all have their own system of tunnels in the city. The colonies often consist of around 1000 prairie dogs and are often inherited in generations.

Illustrerad Vetenskap 2015/1:50

Both of the texts above come from the article “the master architects of animals”, and two slightly different definitions of family are here presented to us. Reading the representation of weaver birds literary, I get the impression that each family consist of 400 individuals. From the context, the picture presented next to the text and the descriptions of pairs living together with own entrances, I though choose to see this formulation as a grammatical mistake – that what is intended to be mediated is that each family consists of 4 individuals and the whole “cooperation” of 400 individuals. The parallel to what in the human western society is called a family is thus not controversial; it consists of two adults (implicit: one male and one female) and two babies. The family represented in the text about the coyotes might be slightly more controversial in this aspect since it contains more than two adults. That is also made visible in that the family is not called a family only, but an *extended* family (sw: “storfamilj”). It is thus pointed out that the size of this family is slightly bigger than expected, though it contains an important element that is missing in a text I will present below: individuals of different sexes.

Both texts present an idea about different scales of organization and how the part relates to the whole. The family is presented as the smallest organized entity and I find it interesting to reflect upon how much the sovereignty and integrity of the families is emphasized. It seems to me like the groups’ possibility and willingness to distinguish from the whole, by having “their own entrances” or

“their own tunnel system” within the “cooperative” or “colony”, is an important component that makes them families.

I will now turn to an example where group constellations are not considered being families, starting with coming back to the text about sperm whales:

Extract from: *Watch out for upsetting the tough of the deep sea*

At the same time, the whales have developed both a complex social culture and advanced forms of communication. The female sperm whales organize in women's cooperation with up to 14 females. While one of the females is diving for food, the other single mothers keep an eye on her baby. Every flock also has its own language of clicks that differs from the language of other flocks. [...]
The whale hunters knew that a sperm whale mother and her sisters would do anything to protect her baby until the very last.

Illustrerad Vetenskap 2015/4:26,29

The group constellation that is described in this context could, in some aspects, live up to the criteria for being what is viewed as a family; the individuals live in a close relationship where they cooperate with livelihood and childcare. Still, the constellation is not considered a family. I would stress that two possible reasons for that is that (1) there is no male involved and (2) the group members are too many and not sexually or biologically related to each other (at least from what is articulated in this text). Instead, the group constellation is named in three different ways; women's cooperation, flock and sisters, and I find all of these three labels interesting in this aspect.

“**Flock**” is a category that is rarely used in descriptions of human groups and might thus be a label that is most accepted within the animal science discourse (following the idea about the taboo to anthropomorphizing). It is hence also the

label that indicates the largest distances between human and animal organization; that this grouping is something that belongs to the animal sphere only and has no equivalent within human culture.

“**Women’s cooperative**” is a label that can be highly associated with the humans’ world and the socialist-feminist movement of the 70s with women striving to challenge the family norm and live their lives in large cooperatives without men. Thus, using this metaphor prescribes the whales with attributes such as the ability to be political conscious and thus make political decisions. One way to view this is that the whales’ way to organized is in this way being culturalized by this metaphor, and the explanation of this behavior is thus that the whales have made an active decision based upon a conscious political standpoint. The opposite interpretation if of course also possible. Given that the whales are seen as possessors of the natural gender characteristics, this figurative use of language may help to *naturalize* the phenomenon of women’s cooperative. Also, the label of “**sisters**” can, apart from the obvious association to a sibling relation, be associated to the cooperative-metaphor since parallels between spiritual connection and biological relationship are not uncommon within certain sub-cultures.

An interesting mind experiment that I have tried is to imagine to call the 14 members of the group “**partners**” instead. It directly struck me that this kind of labeling is not likely to occur in this context, and that is yet another sign of how a partner relationship is defined (for animals as well as humans): a pair of two individuals living in a sexual relationship where most preferable one is a male and the other a female. The fact that these individuals are not considered living in partner relationship makes them “single mothers” (Sw: ensamstående mam-mor). This formulation indicates that the way that being single is defined has lit-

tle to do with whether the individual lives in a close relationship to other individuals or not. In this case, I would claim, what makes a sperm whale mother a single mother is the fact that she neither has close cooperation with the male that genetically is father to her baby, nor any other male.

Another example where the norm of heterosexuality is visible in this text regarding the reproduction system of the tripod fish:

The tripod fish can mate with itself

All animals in the deep sea must face a serious problem. The distances are long between conspecifics in the sparsely populated environment, and many fishes may live a whole life without meeting the opposite sex. The tripod fish has found a radical solution to the problem. If a partner never shows up, it mates with itself. With its long fins, the herring-looking fish can stand on the bottom while it patiently waits for food and a partner.

Illustrerad Vetenskap 2015/6:62

I consider the grade of naturalizing in the description of this fish's norm breaking behavior low. That is because of the context where the behavior is to a great extent portrayed as abnormal. The *serious problem* of not meeting an individual of the opposite sex is presented as an almost mentally painful dilemma. The text strives to make the reader feel empathy with the fish by describing it as *patiently waiting*, where waiting for a partner is equated with starving for food. Also the formulation of *living a whole life without meeting the opposite sex* contributes to this empathy and pity-feeling for the fish. It is also strongly emphasized that mating with oneself is only the second best option; the emergency solution: *If a partner never shows up, it mates with itself*. That statement is made even stronger with the fact that the solution is described as *radical*.

5 Conclusions

In this chapter I will conclude the result of this study by returning to the research questions.

5.1 How is gender produced and reproduced within the discourse of animal behavior in popular science?

This study has shown a plurality of modes to produce gender/sex in representations of animals. One of them is to use the readers' preconceptions of masculine and feminine to let her gender the described animal herself. When the animals are explicitly gendered in the texts, they establish a picture of the male and female animals behaving similar to what is expected from women and men in the human culture.

The texts reproduce a picture of the female as an individual who, in sexual contexts, are more passive and less willing to participate in sexual activities than the male. She is presented as picky in the choice of partner and the male is presented as willing to sacrifice in order to persuade or force the female to mate. Though, at the time when the mating act has started both the male and female individuals may be presented as active.

When the fertilization part of the sexual reproduction is completed the responsibility is now on the female. Norms about the female as the individual with the main responsibility for nursing offspring shows e.g. in descriptions of the absence of one parent. An absent mother is described in a more problematized way than an absent father. Ideas about a nuclear family, and the woman's role in it are reproduced in descriptions of animals group constellations where not all groups are considered families.

5.2 How does the discourse of animal behavior in popular science serve to establish and maintain existing power relations between sexes?

In the analysis, I have argued that *naturalization* of domination between the sexes is an overall strategy that can be discerned throughout all texts. The gender division of labor and the systematic asymmetrical power relation between men and women is presented as natural and non-socially constructed, by portraying animals as carriers of the natural gender behavior, while at the same time prescribing them with human qualities. Different kinds of tropes, e.g. anthropomorphizing metaphors, with associations to the human world, are used repetitively and works to prescribe the animals with human characteristics and do thus serve to make people identify themselves with animals. Also, some animal behavior is labelled “rape” or “prostitution” which once again make this kind of phenomenon naturalized and legitimate.

Within the strategy of naturalization - presenting the animals as carriers of natural gender behavior - I have identified other strategies to prove explanations of the imagined domination between the sexes within the animal sphere. These explanations could possibly, given that the animals are considered “natural humans” be applicable on the human’s world as well. Such strategies could be the rationalization – explaining the animal’s behavior by presenting a logical chain and thus make it seem legitimate, worthy of support (Thompson 1990:61). Another strategy could also be the *passivization*; to delete actors and their agency to present phenomena as permanent and natural, outside time (ibid :66). This

passivization can in a way be used both to “free” a dominating part from the responsibility or to present the subordinated part as passive and not able to take own rational decisions.

5.3 Finally

The material has shown not only clear signs of an image of the man as *the* human, but also the human as *the* species. The division of human and animal, and species as such, is yet another way to categorize individuals constituting the base for imbalanced power relations. How are these differences created, and how are they established in the popular science discourses? Those are examples of questions that I haven’t been able to ask to my empirical material, due to limitation of space and time, that I would find interesting to look further upon.

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2015

No 1

"Fågel lockar med fint hus och trädgård" p. 44 and "Fåglar lever i sociala bostäder" p.47 "Präriehundens underjordiska städer" p.50 In: "Djurens mästarkitekter p.44–51"

No 2

"Tänk om...?" p.6 In: "Skriv till oss" p.6

No 3

"IV är inte Nature" p.8 In: "Skriv till oss" p.8
"Varför har slöa lejon stora muskler?" p.72

No 4

"Fiskar utförde tidernas första samlag" p.12
"Akta dig för att reta upp djuphavets slagskämpe" pp. 24–29

No 5

Preamble p. 44 and "Insekter leker jage" p. 51 In: "Världens snabbaste djur" p.44–51

No 6

"Stativfisker kan para sig med sig själv" p. 52 In: "Ett hårt liv på botten" pp. 56–63

No 7

"Kvinnan har en g-punkt" pp. 50–57

No 8

"Hungliga bönsyrsor lockar hanar till sex" p. 11
"Ödlans penis utvecklas snabbt" p. 14

No 9

"Pappan ruvar äggen i munnen" photo spread, pp 8–9
"Finns det prostitution i djurriket?" p. 72

No 10

"Första samlaget" p.6 In: "Skriv till oss" p.6

No 12

"Upptaget – tillträde förbjudet" p. 32 and "Sylvass penis spetsar hona" p. 33 In: "Sädesceller är fortplantningens elitsoldater"

Appendix: Texts in Swedish

NATUREN ÄR FULL AV VÅLDTÄKTSMÄN

Sylvass penis spetsar honan. Vägglusen utför sin parning med en brutalitet som i människorna värld skulle medföra ett längre fängelsestraff. Fenomenet kallas traumatisk inseminering och går till så att en hane anfaller en hona och genomborrar hennes exoskelett på ett slumpmässigt ställe med sitt spjutformade parningsorgan. Därefter sprutar han in sädescellerna i hennes kropp och så få de själva leta sig fram till äggen och befrukta dem. Behandlingen är så våldsam att honan definitivt inte är intresserad av att para sig igen. Ofta dör honan kort efter äggläggningen.

Nr 12 s 33. Utdrag ut underrubrik till ”sädesceller är fortplantningens elitsoldater” (28–33)

VARFÖR HAR SLÖA LEJON STORA MUSKLER?

Trots att lejon vilar mellan 18 och 20 timmar om dygnet har de stora, starka muskler. Fenomenet kan vara överraskande – inte minst eftersom vi människor blir slappa och svaga om vi skulle ligga ned 75 procent av tiden. Förklaringen grundar sig i att lejon har utrustats med stora muskler till skillnad från människor. Lejonhanar tränar genom att slåss och jaga bort andra hanar från sitt territorium. Slagsmålen med andra lejon är hårt arbete och håller lejonet i god form.

Nr 3 s 72. Ur ”Fråga oss”

VÄRLDENS SNABBASTE DJUR

Jakt, flykt och uppvisning för honor. Djur har många goda skäl att öka hastigheten. Inbyggda åror och halksäkra sulor är de några av de kvaliteter som medför framgång och gör vissa djur till naturens kvickaste: - på land – till havs – i luften

Nr 5 s. 44 Ingress till ”världens snabbaste djur” (44–51).

AKTA DIG FÖR ATT RETA UPP DJUPHAVETS SLAGSKÄMPE

Ingress: Med ett enda slag kan stjärtfenan bryta en späckhuggares rygg – och nospartiet kan få vittring på en valfångstbåt. Kaskeloten är vanligtvis en av djuphavets godmodiga jättar, men när dess ilska väl är väckt är den en av havets mest skrämmande fiender

Faktaruta: Filmen *In the heart of the sea* har premiär i mars och är baserad på den sanna historien om valskeppet *Essex*. Båten sjunker efter ett angrepp av en enorm kaskelot. I flera månader flyter besättningen runt i små jollar utan mat och dryck. Bara åtta av 20 män överlever.

Brödtext: Valfångstbåten *Essex* befinner sig 3700 kilometer från Chiles kust i södra Stilla havet. Året är 1820 och denna novembermorgon börjar bra för sjömännen, som

har fått syn på en flock kaskelotvalar. Tre små valbåtar sjösätts och männen ror ut mot de stora däggdjuren. Plötsligt dyker det upp en kaskelot bredvid en av de små jollarna. Besättningen borrar en harpun genom valens tjocka hud, men kaskeloten svarar med ett stjärtslag som slår upp ett hål i jollen. Styrmannen hugger resolut av harpunlinan med en yxa, så att inte valen ska dra med sig männen ner. Trots skadorna lyckas besättningen ro tillbaka till Essex. Men inte ens på den stora valfångstbåten är männen i säkerhet.

Från fartygets däck får besättningen syn på en enorm kaskelothane – enligt sjömännen rör det sig om en bjässe på 80 ton. Hanen sätter kurs mot fartyget dunkar sitt enorma nosparti i skrovet. De 30 centimeter tjocka spanten och tio centimeter tjocka plankorna av solid ek ger efter, men håller. Valen tar en kort paus, sedan angriper han igen. Med en kraft som sjömännen inte kunnat föreställa sig knuffar kaskeloten till fartyget, så att skrovet trycks in och vattnet forsar in över däck. Knappt tio minuter senare har Essex sjunkit.

Under normala omständigheter är världens största tandval en godmodig jätte. Men kaskeloten är inte någon rolig motståndare när den pressas till att försvara sig. På 1800-talet, när valfångsten hade sin storhetstid, gick kaskeloter upprepade gånger till angrepp mot de små jollarna och de stora valfångstbåtarna. Essex var inte den sista båten som sjönk efter en kollision med en kaskelot.

Klok nog att planera angrepp

Sedan angreppet på Essex har valexperter diskuterat om kaskeloter medvetet har gått till motangrepp mot valfångarna. Kaskeloten är ett ytterst intelligent djur, som har världens största hjärna med en vikt på upp till nio kilo. Samtidigt har valarna utvecklat både en komplex social kultur och avancerade kommunikationsformer. Kaskelothornorna organiserar sig i kvinnokollektiv på sju till 14 honor. Medan en av honorna dyker efter föda håller de andra ensamstående mammorna uppsyn över honans unge. Varje flock har också sitt eget språk av klickljud, som skiljer sig från andra kaskelotflockars.

Kaskeloter är alltså så intelligenta att de kan ha varit medvetna om att valbåtarna var fiender som skulle bekämpas. Men eftersom kaskeloter normalt är fredliga djur tror forskarna att giganterna bara går till angrepp mot människor om de först har blivit angripna själva.

Ärr avslöjar slagsmål

I mötet med livshotande valfångare, rivaliserande artfränder eller valens ärkefiende i havet – späckhuggaren – kan kaskeloten mycket väl visa tänder. Eftersom jätten varken är särskilt snabb eller smidig utnyttjar den i stället sin vikt och styrka i strider. När en kaskelothane simmar in i sina motståndare motsvarar det ett 45 ton tungt fartyg som kolliderar med kajen i en hamn. Med en vikt på upp till tio ton kan nospartiet ge en rejäl knuff, som när valen rammade Essex.

Kaskeloten använder också kraftfulla slag med den fem meter breda stjärtfenan som vapen. Valens upp till 30 centimeter långa tänder kommer till användning när rivaliserande hanar ska sättas på plats. Tänderna fyller ingen funktion när kaskeloten äter sin favoritföda, bläckfisk, utan är enligt forskarna uteslutande avsedda för strider. Hanarna har därför ofta ärr och bitmärken på kroppen. Det händer till och med att marinbiologer stöter på kaskelothanar med brutna käkar – skador som forskarna tror kommer från rivalers attacker. För kaskelothanarna skulle det vara fruktlöst att försvara territorier i de stora världshaven. Men när det finns parningsberedda honor i farvattnen, utkämpar hanarna sina slag vid ytan.

En för alla och alla för en

Späckhuggaren är, förutom människor, kaskelotens enda livshotande fiende. Forskare har iakttagit späckhuggare som övermannat en kaskelot och vid ett flertal tillfällen har man hittat rester av val i buken på späckhuggare.

En fullvuxen kaskelothane som stöter på en flock späckhuggare gör vanligtvis en djupdykning och lyckas simma ifrån plågoandarna. Späckhuggare klarar inte att dyka ner mer än ett par hundra meter, medan kaskeloter kan dyka så djupt som två och en halv kilometer. Honorna, som vaktar ungarna, har inte samma flyktmöjlighet eftersom de små kalvarnas lungor inte klarar så djupa dyk. En kaskelotkalv är en liten godbit för en späckhuggare. För att skydda sin små använder kaskelothonorna en försvarsstrategi som liknar myskoxarnas när de jagas av varg: Valarna samlas vid ytan, där de hela tiden kan andas frisk luft, och bildar en ring med sina ungar i mitten.

Man har sett större kaskelotgrupper i ring med huvudena vända utåt mot fienden, men oftast vänder kaskeloterna sina huvuden inåt i ringen, mot kalvarna, och piskar våldsamhet med stjärtarna utåt mot angriparna. Stjärten kan slå med en hastighet på tre meter i sekunden och en enda fullträff med den tunga stjärtfenan kan bryta ryggen på en späckhuggare. Men hungern kan ändå pressa späckhuggarna att ta risken att angripa – även om det inte finns några kalvar bland valarna.

De svartvita jägarna är dock inget hot mot kaskelotbestånden, eftersom de vanligtvis har stor respekt för valarnas förmåga att försvara sig. Späckhuggarna undviker oftast att angripa och jagar istället mindre byten som är lättare att övermanna.

Solidaritet är självmord

Lika effektivt som kaskeloternas starka sammanhållning fungerar i kampen mot späckhuggare, lika livsfarlig var den i kampen mot 1800- och 1900-talets valfångare. I början av 1800-talet var jakten på kaskeloterna hård och intensiv. Kommersiell utvinning av råolja från underjordiska bergslager hade ännu inte påbörjats och kaskeloternas enorma nosparti innehåller en av världens finaste sorters olja.

En fullvuxen hane har uppemot 2000 liter olja, så ren att valfångarna utan förarbete kunde hälla oljan direkt från det spräckta huvudet ner i oljelampor. När kaskeloterna insåg faran i att en valfångstbåt närmade sig, intog valarna den inövade försvarsformationen för att skydda kalvar och sårade. Men kaskeloternas försvarsstrategi visade sig vara bristfälligt. När de hade placerat ut sig med plaskande stjärter i en cirkel på ytan, kunde den harpuneraren börja med att träffa den största kaskeloten och fortsätta med att

skjuta resten av valarna en efter en. Med tiden verkar det dock som att valarna har ändrat försvarsstrategi. Valfångarna har åtskilliga gånger observerat kaskelotflockar som mot sin natur spritt ut sig eller dykt ner och simmat mot vinden, där åtminstone 1800-talets segelfartyg hade svårt att följa efter.

Andra kaskeloter gick direkt till angrepp mot valfångstbåtarna, på samma sätt som när den gigantiska kaskelothanen rammade Essex. Men valfångarna hade ett recept mot den sortens undvikande manöver. Mycket målinriktat fokuserade de på att såra en kalv för att på så sätt locka upp hela flocken till ytan. Valfångarna visste att en kaskelotmamma och hennes systrar skulle göra allt för att försvara en unge in i det sista.

Nr. 4 s. 24–29.

FÅGEL LOCKAR MED FINT HUS OCH TRÄDGÅRD

Lövsalsfågeln är en riktig mästare på att pynta fint och när hanen är på jakt efter en partner kämpar han stenhårt för att överglänsa sina rivaler. Lövsalsfågeln lever inte i fasta parförhållanden och hanen hjälper varken till med att bygga bo, kläcka ägg eller uppfostra ungar. Det enda han bidrar med är sina gener och därför är honorna extremt kräsna när de ska välja en partner. I sina försök att få en hona på fall uppför hanen ett älskogsnäste som påminner om en lövsal. Först anlägger han en plats som är väl pyntad med till exempel blommor eller bär, sorterade efter färg. Vissa arter bygger en sorts majstång av pinnar i stället för en sal. Stången kan vara över två meter hög och dekorerad med girlanger av larvexkrementer. När en hona låter sig lockas av hanens mästerverk och landar vi salen, dansar han för henne som uppvärmning för parningsakten.”

Nr1 s 51. Underrubrik till längre artikel ”Djurens mästerarkitekter” (44–51)

FINNS DET PROSTITUTION I DJURRIKET?

Forskare har hos vissa djurarter registrerat beteenden som kan kallas prostitution, eftersom honorna låter hanarna para sig med dem i utbyte mot olika förmåner. Prostitution hos djur upptäcktes först hos adeliepingviner i slutet av 1990-talet. Forskarna konstaterade att vissa honor var villiga att para sig med andra hanar än sin fasta partner – om de i gengäld fick en sten för att bygga bo med. Stenar står högt i kurs i pingvinkolonier eftersom stenarna inte räcker till alla. Ett liknande fenomen har studerats bland schimpanser, där honor parar sig med främmande hanar i utbyte mot mat. En förklaring till fenomenet kan vara att hanarna tar varje chans att sätta mer avkomma till världen, medan honorna testat hanarna som potentiell framtida partner.”

Nr 9 s. 72. Ur ”Fråga oss”

HUNGRIGA BÖNSYRSOR LOCKAR HANAR TILL SEX

Svält får bönsyrsehonor att tillgripa ett tarvligt trick. De lockar hanarna med sex men biter istället huvudet av dem och äter upp dem. Det visar ett australiensiskt försök med bönsyrsehonor i olika grader av svält. Den mest utsultna drog till sig 25 hanar, medan den fetaste bara lockade 15 hanar. De andra honorna lockade till sig mellan fem och tio hanar vardera.

Nr 8 s. 11. Ur ”Nya rön”

FISKAR GENOMFÖRDE TIDERNAS FÖRSTA SAMLAG

Paleontologi. Samlaget ”uppfanns” av en cirka åtta centimeter lång, primitiv fiskart, som levde för cirka 385 miljoner år sedan. Den slutsatsen drar ett internationellt forskarlag, som i detalj har studerat fossil av en utdöd, bepansrad fisk. Fisken levde sitt liv i sjöar ibland annat det nuvarande Skottland. Fiskarna parade sig medan de befann sig vid sidan av varandra. I den positionen kunde hanen lättast manövrera sitt könsorgan in i honan och genomföra tidernas första inre befruktning. Det förklarar en av forskarna bakom upptäckten, paleontologen John Lang från det Flinders University i Australien. Fiskarnas små ”armar” hjälpte hanen att hålla positionen under akten.

Bilder: Direkt till höger om texten två ”fotografier” över vad som kan antas vara fossil av den beskrivna fisken. Två fossiler med något olika utformning och med rubrikerna ”hona” respektive ”hane” – bilden på honan är överst och hanen underst. Hit pekar pilar från en animerad bild som ligger till höger. Hanens könsorgan utpekats.

De två individerna som ses som fossiler i föregående bild har här animerats i vad som kan antas vara en parningsakt. Flera ”fiskar” finns med på bilden men två är i fokus (vilket även pilarna visar). Nått som pekas ut som ”hanens könsorgan” är sammankopplat (ifört) i någon form av öppning i ”honan”.

BILDTEXT: De bepansrade fiskarna genomförde världens första samlag sida vid sida. Nr 4 s. 12 ur ”Nya rön”

LÄSARREAKTION PÅ ”FISKAR GENOMFÖRDE TIDERNAS FÖRSTA SAMLAG”

FRÅGA: I nummer 4/2015 finns en nyhet om att fikat genomförde historiens första samlag. Men hur fortplantade sig deras föräldrar utan fullt utvecklade könsorgan? Och vilken evolutionär fördel har det varit att inte ha fullt utvecklade könsorgan? Michael Tuveson

SVAR: De fiskar som vi skriver om hör till den hittills äldsta kända arten med ett manligt könsorgan som förs in i honan för att befrukta äggen. Det innebär inte att de är de första individerna med denna egenskap, och forskarna har inte heller hittat föregångaren. Det är fortfarande oklart hur könsorganen har uppstått.

Nr 10 s.6. Ur ”skriv till oss”

INSEKTER LEKER JAGE

När hästbromsen ska imponera på en parningsberedd hona kan den notera en hastighet på upp till 145 km/h. Den blott tolv milligram tunga hanen övermannar honan i luften. Samtidigt som de båda faller mot marken parar de sig.

Bildtext: Hanbromsen övermannar honan i luften. Sedan parar de sig under fallet.

Nr 5 S. 51 ur ”Världens snabbaste djur” (44–51)

ÖDLANS PENIS UTVECKLAS SNABBT

Vissa kroppsdelar är viktigare än andra. I varje fall har biologer kommit fram till att genetiska förändringar när det gäller storlek och form på en ödla penis sker sex gånger

snabbare än i andra kroppsdelar. Forskare mätte penis och andra lemmar hos 25 olika ödlearter och beräknade utvecklingshastigheten hos dem. Det snabba tempot beror förmodligen på att honorna föredrar en speciell form och storlek på penisen

Nr 8 s. 14

PAPPAN RUVAR ÄGGEN I MUNNEN

Livet som ensamstående pappa är inte alltid så lätt – speciellt inte för kardinalabborrfisken. Honan lägger bara sina ägg bredvid hanen och överlåter därefter resten till honom. För att skydda sin avkomma mot rovdjur placerar hanen alla ägg i sin mun efter det att han har befruktat dem. Innan äggen kläcks kan han därför inte äta något – förutom de ägg han råkar svälja under ruvningen. Kardinalabborrfiskens ljusorgan innehåller självlysande bakterier som får fisken att skina.”

Nr 9 s. 8-9. Bildtext till bilduppslag ”fullträff”

UPPTAGET – TILLTRÄDE FÖRBJUDET

När en hane har levererat sin sperma kan han i princip glömma allt om sädescellerna och inte bry sig om vad som händer med dem. Men vissa djurarters hanar gör ändå det där lilla extra för att säkerställa att inte andra hanars sädesceller blandar sig i processen. Hos till exempel anakondor stänger hanen dörren för eventuella efterföljare. Sädessvåtskan stelnar till en propp i honans könsöppning så att hon inte kan para sig igen. Proppen gör att sädescellerna får ett par dygn på sig för befruktningen. Efter två-tre dagar faller proppen ut och en ny hane kan prova lyckan.

NR 12 s 32 Underrubrik till ”sädesceller är fortplantningens elitsoldater” s. 28–33

FÅGLAR BOR I SOCIALA BOSTÄDER

På håll liknar redet en höstack som är på vippen att falla ned från ett träd. Men när man kommer närmare uppenbarar sig ett hantverksmässigt vävt storkollektiv, vars invånare lever tillsammans i par, med eget rede och egen ingång. Vävarfåglarnas gemensamma bon kan husera ända upp till 100 familjer som består av cirka 400 individer, och är byggt så rejält och stabilt att talrika generationer kan få glädje av den: Med rätt underhåll kan redet hålla i över 100 år.

De största av vävarfåglarnas bon är cirka sex meter breda och tre meter höga och kan väga flera ton. Inne i boet lever fåglarna sida vid sida i ett lägenhetskomplex med 10-15 centimeter breda kammare, fodrade från golv till tak med mjuka växtdelar, päls, bomull och dun.

Undertill har lägenheterna en egen entré som består av en 25 centimeter lång tunnel där öppningen skyddas av taggtråd i form av vassa strån.

Nr 1 s. 47 Underrubrik till ”Djurens mästarkitekter” (44–51)

PRÄRIEHUNDENS UNDERJORDISKA STÄDER

Under öppna gräsvidder i USA och Kanada lever prairiehundar i städer med vidsträckta grottsystem som de själva grävt ut med sina skarpa klor. Städerna kan ses på långt håll tack vare de små jordkullarna som prairiehundarna byggt upp kring ingångarna till sina bon. Jordkullarna påminner om skorstenar och fungerar både som ventilationssystem och vaktorn, där en eller flera prairiehundar håller vakt medan familjen jagar föda.

Gnagarna lever tillsammans i storfamiljer med en hane och upp till fem honor, som alla har ett eget tunnelsystem i staden. Kolonierna består ofta av cirka 1000 prairiehundar och går ofta i arv i generationer. En vanlig koloni täcker en yta på cirka 1,3 kvadratkilometer, men en del städer är betydligt större. Den största man känner till fanns i Texas och var 65 000 kvadratkilometer stor - sex gånger så stort som Skåne. I den enorma storstaden fanns sannolikt 400 miljoner invånare.

Nr 1 s. 50 Underrubrik till "Djurens mästarkitekter" (44–51)

STATIVFISKEN KAN PARA SIG MED SIG SJÄLV

Alla djur i djuphavet dras med ett allvarligt problem. Det är långt mellan artfränder i den glesbefolkade miljön, och många fiskar kan leva ett helt liv utan att möta det motsatta könet. Stativfisken har hittat en radikal lösning på problemet. Om någon partner aldrig dyker upp så parar den sig med sig själv. Med sina långa fenor kan den sillliknande fisken stå på botten medan den tålmodigt väntar på föda och en partner.

Nr 6 s. 62 Underrubrik till "Ett hårt liv på botten" (56–63)